Asthma Burden Report
New Hampshire
2010

Chapter 3: Asthma Risk Factors and Co-Morbidities

New Hampshire Department of Health and Human Services
Division of Public Health Services, Asthma Control Program
June 2010

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* 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.

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Asthma Risk Factors and Co-Morbidities

Risk Factor Highlights:

- In 2007-2008, an average of 21.1% of adults in New Hampshire with asthma were current smokers, and while smoking decreased among adults without asthma, there was no change among adults with asthma.
- More than 30% of children with asthma lived in a household with someone who smoked.
- Nearly 1/3 of adults and over 2/3 of children with asthma did not meet the recommended guidelines for physical activity.
- Almost 70% of adults with asthma were either overweight or obese; over 1/3 of adults with asthma were obese. Adults with asthma are statistically significantly more likely to be obese compared with adults who do not have asthma.

Co-Morbidity Highlights:

- Adults with asthma were approximately 3 times more likely to report having major depression and more than 5 times as likely to report having COPD compared with adults who do not have asthma.
- The data suggest that the prevalence of diabetes and cardiovascular disease was higher among adults 45-65 years old with asthma compared with adults who do not have asthma.

This chapter presents data from the 2000-2008 New Hampshire Behavioral Risk Factor Surveillance System (NH BRFSS); 2006-2008 NH BRFSS Adult and Child Asthma Call-back Surveys; 2004, 2007 and 2009 Youth Tobacco Survey (YTS); and 2007 National Survey of Children's Health (NSCH). It includes information on asthma risk factors (e.g., smoking and exposure to secondhand smoke, physical activity and weight status) and co-morbidities (e.g., depression, chronic obstructive pulmonary disease, diabetes and cardiovascular disease).

Definitions:

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?"

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?"

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 former asthma are not included in this report.

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.

3.1 Risk Factors for Asthma

Asthma is a complex disease that can be aggravated by various personal health behaviors as well as environmental triggers. Smoking and exposure to secondhand smoke, lack of physical activity, and obesity can be characterized as risk factors that affect asthma. Studies have shown they can result in increased asthma episodes or exacerbations, increased asthma severity, decreased asthma control, and increased utilization of health care services.[1] The focus of this section is on health behaviors. Chapter 5 will cover selected environmental asthma triggers.

Smoking and Exposure to Secondhand Smoke

Smoking can trigger asthma symptoms, while secondhand smoke is known to exacerbate asthma and it may also be a risk factor for the development of asthma.[2-5]

Visit www.TryToStopNH.org for free resources that can help people quit tobacco.

Smoking is associated with increased severity of asthma symptoms, reduced quality of life, and increased utilization of health care services among individuals with asthma.[1,6] Smokers are also more likely to have uncontrolled asthma[7-9] and a decreased responsiveness to inhaled corticosteriods, a medication used to control asthma symptoms and prevent exacerbations.[10-12] Smoking cessation and, to a lesser extent, reductions in daily smoking have been shown to improve asthma management.[13-14]

Exposure to secondhand smoke, sometimes also referred to as environmental tobacco smoke, adversely affects both children and adults with asthma. Children whose parents smoke are much more likely to develop asthma than children of non-smokers.[3-4] Studies also suggest greater disease severity in children exposed to tobacco smoke in the home.[2] Reduced exposure to secondhand smoke among non-smoking adults and children with asthma has been shown to improve asthma-related health status and reduce health care utilization.[15-16]

For information about tobacco cessation in New Hampshire, please visit the following websites:

The Try To STOP TOBACCO website at www.TryToStopNH.org or call the NH Smokers' Helpline at 1-800-Try-To-STOP (1-800-879-8678). The Try To STOP TOBACCO website provides a forum for tobacco users to self-refer for free and confidential counseling, information about local tobacco treatment resources, fact sheets, and a link to online quitting communities. The Helpline is the gateway to tobacco cessation services offered to New Hampshire residents; it is toll-free and offers telephone-based counseling, free print materials, and referrals to local tobacco treatment programs.

Health Care Providers visit www.QuitWorksNH.org. QuitWorks-NH is a free, evidence-based, on-line tool to assist providers with best practices for treating tobacco use. Through Quit Works-NH, providers may fax-refer patients who want to quit to certified tobacco treatment counselors who will phone the patient within 48 hours.*

*QuitWorks-NH was adapted by the New Hampshire Division of Public Health Services from the Massachusetts QuitWorks Program.

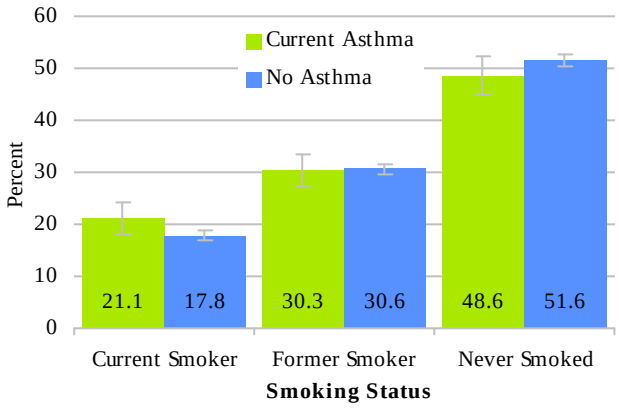
Prevalence of Smoking by Asthma Status:

There were no statistically significant differences by asthma status in the prevalence of smoking among adults in New Hampshire in 2007-2008.

However, there are statistically significant differences nationally: adults with current asthma are statistically significantly more likely to be current smokers than adults who do not have asthma.

Another way to look at the data is by examining the prevalence of asthma by smoking status: among adults who smoke an estimated 12% had asthma compared with 10.3% of former smokers and 9.8% of adults who never smoked; these estimates are not statistically significantly different from each other (*See Table 3.3.1)*.

Figure 3.1.1
Two-year average prevalence of smoking among adults 18+ years old by asthma status - New Hampshire, 2007-2008

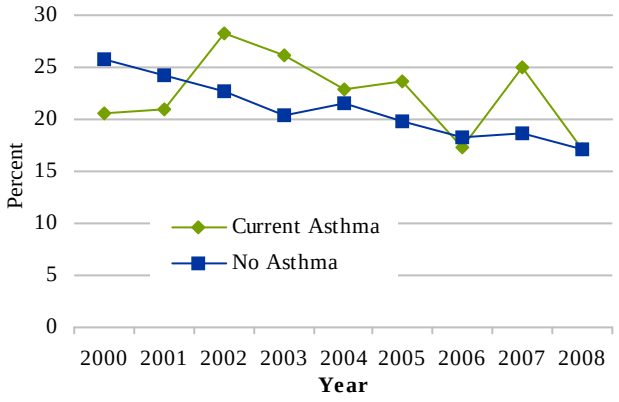


Data Source: 2007-2008 NH BRFSS

Trend in the Prevalence of Smoking by Asthma Status:

Between 2000 and 2008, there was not a statistically significant change in the prevalence of smoking among adults with asthma, but there was a statistically significant decrease in smoking among adults without asthma.

Figure 3.1.2
Trend in prevalence of current smoking among adults 18+ years old by asthma status - New Hampshire, 2000-2008

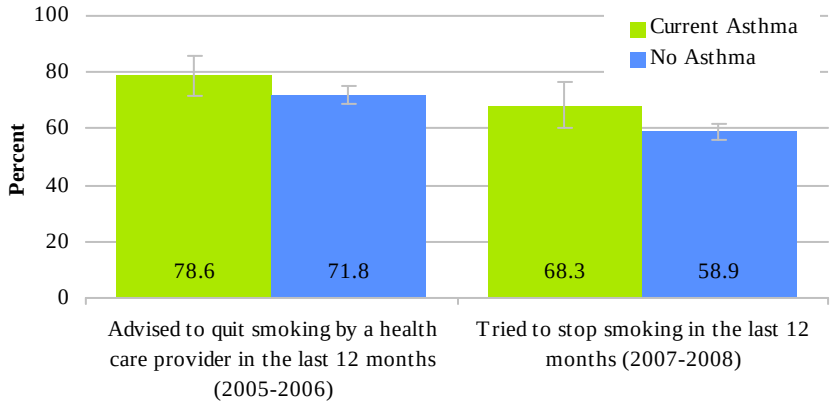


Data Source: 2000-2008 NH BRFSS

See Table 3.1.2 at the end of this chapter for point estimates and confidence intervals for data presented in Figure 3.1.1 and for national estimates. See Table 3.1.3 for point estimates, confidence intervals and trend analyses for data presented in Figure 3.1.2.

The U.S. Public Health Service Clinical Practice Guidelines (PHSG), *Treating Tobacco Use and Dependence: 2008 Update*, states that health care providers should ask people their smoking status (e.g., current, former, never) at every visit and if they smoke, advise them to quit and refer them to cessation resources (e.g., www.TryToStopNH.org or NH Smokers' Helpline 1-800-879-8678). Because it takes an average of ten or more tries to quit smoking and stay smoke free, the more assistance offered to quit (e.g., cessation counseling, medication) the greater the chance of staying successfully quit.[17]

Figure 3.1.3
Percent of adult current smokers 18+ years old who have seen a health care provider in the last 12 months and been advised to quit smoking, and/or tried to stop smoking in the last 12 months, by asthma status - New Hampshire, 2005-2008



Data Source: 2005-2008 NH BRFSS
Note: Because questions on the NH BRFSS vary from year to year, data from four years were examined; the years the data were collected are provided in parentheses next to the indicator.

Adults 18+ years old who were advised to quit and/or tried to quit in the last 12 months:

Approximately 3/4 of adults with asthma who smoked and visited a health care provider in the last 12 months were advised to quit smoking.

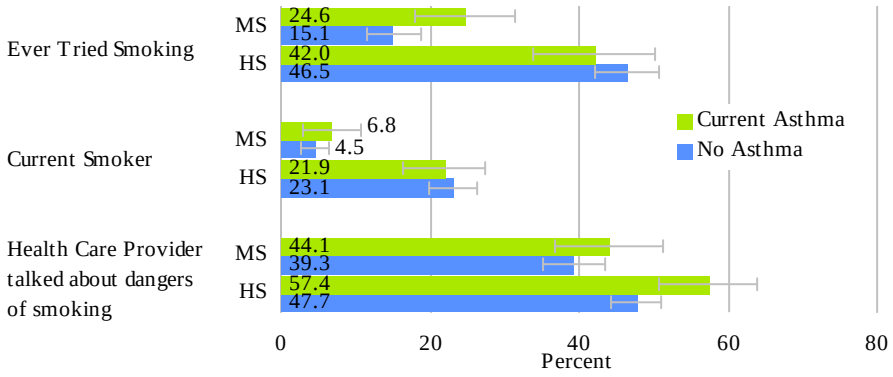
Over 2/3 of adults who had asthma and smoked tried to stop smoking in the last 12 months.

There are no statistically significant differences by asthma status in the above measures.

See Table 3.1.4 at the end of this chapter for point estimates and confidence intervals for data presented in Figure 3.1.3.

Smoking Among Youth

Figure 3.1.4
Tobacco use and prevention among middle and high school students by asthma status - New Hampshire, 2007& 2009



Data Source: 2007 Middle School YTS and 2009 High School YTS
MS = Middle School; HS = High School
Note: The Middle School YTS was not asked in 2009.

Tobacco Use and Prevention among Youth in New Hampshire:

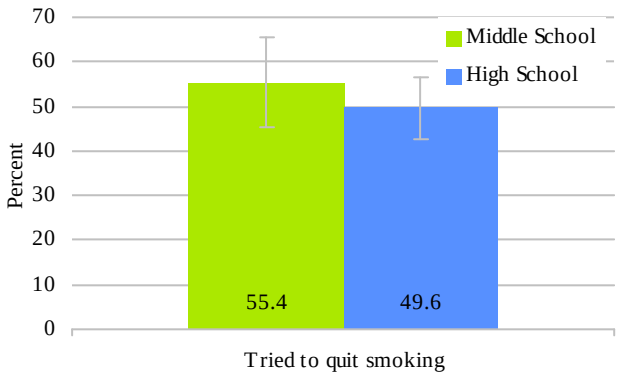
- High school students were statistically significantly more likely to have ever tried smoking and to currently smoke than middle school students.
- Nearly half of all middle school students with asthma and just over half of all high school students with asthma have had a health care provider talk to them about the dangers of smoking.
- There are no statistically significant differences by asthma status in any of the indicators listed in Figure 3.1.4.

Middle and High School Students Who Tried to Quit Smoking:

Approximately half of all middle and high school students who reported smoking tried to quit smoking in the last 12 months.

Analysis by asthma status was not possible for this measure because the number of respondents who had asthma, smoked and tried to quit was too small to produce a reliable estimate.

Figure 3.1.5
Percent of middle and high school students who were current smokers and tried to quit smoking in the last 12 months - New Hampshire, 2007 & 2009



Data Source: 2007 Middle School and 2009 High School YTS

See Table 3.1.5 at the end of this chapter for point estimates and confidence intervals for data presented in Figure 3.1.4; see Table 3.1.6 for data presented in Figure 3.1.5.

Exposure to Secondhand Smoke

Four data sources are used to assess exposure to secondhand smoke among New Hampshire residents. Below is a summary of findings highlighting the consistencies and inconsistencies across these data sources.

Summary of Findings:

Rules about smoking in the home: It appears that the percent of households that allow smoking in the home has decreased from 2001 to 2006. The decline is most apparent among households where the responding adult did not have current asthma [Figure 3.1.6].

Approximately 1 in 5 adults with and without current asthma lived in a household where smoking was allowed in the home [Figure 3.1.6]. Approximately 30% of middle school students with current asthma and 17% of high school students with asthma reported smoking was allowed in the home [Figure 3.1.7]. Based on these results, between 17% and 30% of people with current asthma in New Hampshire lived in households that still allowed smoking in the home.

"Secondhand smoke causes premature death and disease in children and in adults who do not smoke"*

Living with someone who smokes: Approximately 1 in 3 middle and high school students with and without current asthma lived with someone who smoked [Figure 3.1.7]. The National Survey of Children's Health (NSCH) also indicates that approximately 1 in 3 New Hampshire children less than 18 years old with current asthma lived in a household with someone who smoked [Table 3.1.1 on page 3-7].

Living with someone who smokes inside the home: Results from the NSCH indicate that approximately 7% of children less than 18 years old with current asthma in New Hampshire lived with someone who smoked inside the home [Table 3.1.1]. The NH BRFSS Adult and Child Call-back Surveys indicate that approximately 15% of adults and 11% of children with current asthma were exposed to secondhand smoke in their home in the last week. Based on these results, between 7 % and 15% of people with current asthma were exposed to secondhand smoke in their homes on a regular basis.

"Smoking by parents causes respiratory symptoms and slows lung growth in their children."*

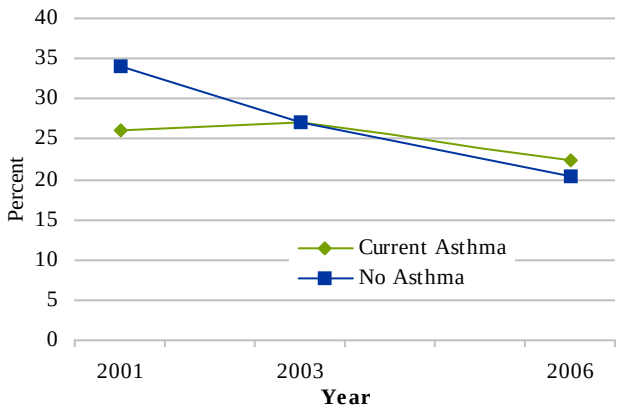
Exposure to secondhand smoke other than in the home: Approximately half of all middle and high school students regardless of asthma status reported being in the same room in the last 7 days as someone who was smoking, and over 2/3 reported being in a car in the last 7 days with someone who was smoking [Figure 3.1.7].

*U.S. Department of Health and Human Services. *Children and Secondhand Smoke Exposure - Excerpts from The Health Consequences of Involuntary Exposure to Tobacco Smoke: A Report of the Surgeon General.* Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, Coordinating Center for Health Promotion, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2007.

Rules about Smoking in the Home by Adult Asthma Status:

Between 2001 and 2006 in New Hampshire, there was a statistically significant decrease in the percentage of households that allow smoking in the home where the responding adult did not have asthma but not among households where the responding adult had asthma.

Figure 3.1.6
Trend in the percent of households where smoking is allowed in the home by adult (18+ years old) asthma status - New Hampshire, 2001-2006



Data Source 2001, 2003 and 2006 NH BRFSS

Exposure to Secondhand Smoke in the Home among Children by Asthma Status:

Nearly one in three children with current asthma lived with someone who smoked. There are no statistically significant differences by asthma status in this measure.

Approximately 7% of children with current asthma lived with someone who smoked inside the home. There are no statistically significant differences by asthma status in this measure.

Table 3.1.1
Percent of children <18 years old who are exposed to smoke in their homes by asthma status - New Hampshire, 2007

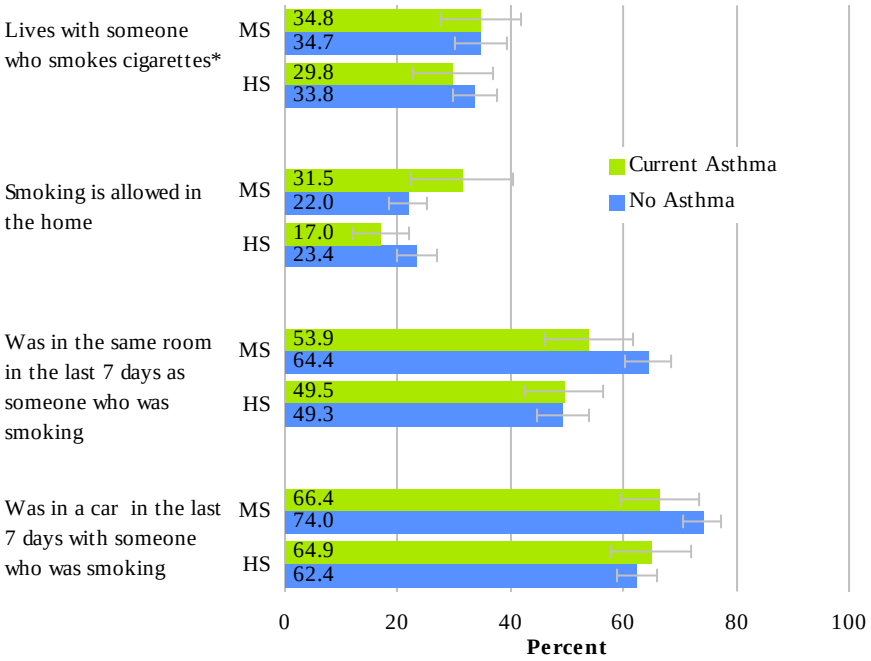
	Current Asthma	No Asthma
Someone in Household Smokes Tobacco		
Percent	**31.6**	**26.4**
95% CI	21.7 - 41.5	23.4 - 29.4
Exposure to Secondhand Smoke in the Home		
No one uses tobacco		
Percent	**68.4**	**73.6**
95% CI	58.5 - 78.3	70.6 - 76.6
Someone Smokes But Not Inside the Home		
Percent	**24.7**	**19.8**
95% CI	15.4 - 34.0	17.0 - 22.5
Someone Smokes Inside the Home		
Percent	**6.9**	**6.6**
95% CI	1.5 - 12.2	5.0 - 8.3

Data Source: 2007 NSCH

Based on results from the 2007 National Survey of Children's Health (NSCH), it appears that smoking is not taking place inside the home for the majority of children who live in households where someone smokes. However, particulate matter that is produced by smoking, sometimes referred to as thirdhand smoke, lingers on clothes and surrounding surfaces long after someone has finished smoking.[18-19] Many of the chemicals found in this particulate matter are toxins and at least 11 are carcinogens known to cause cancer.[2] Thus the health threat posed by smoking, whether inside the home or not, remains.

See Table 3.1.7 at the end of this chapter for point estimates and confidence intervals for data presented in Figure 3.1.6.

Figure 3.1.7
Exposure to secondhand smoke among middle and high school students by asthma status - New Hampshire, 2004, 2007& 2009



Data Source: 2004 and 2007 Middle School YTS, 2009 High School YTS
MS = Middle School; HS = High School
Note: The Middle School YTS was not asked in 2009. Unless otherwise noted, Middle School data are from the 2007 Middle School YTS and High School data are from the 2009 High School YTS.
*Middle School data are from the 2004 Middle School YTS; question was not asked in 2007.

Exposure to secondhand smoke among middle and high school students by asthma status:

- Approximately 1/3 of both middle and high school students regardless of asthma status lived with someone who smoked.
- Approximately 30% of middle school students with current asthma and 17% of high school students with current asthma indicated that smoking is allowed in their home. There are no statistically significant differences by asthma status.
- Approximately 1/2 of middle and high school students reported being in the same room in the last 7 days as someone who was smoking. There are no statistically significant differences by asthma status.
- Approximately 2/3 of middle and high school students reported being in a car in the last 7 days with someone who was smoking. There are no statistically significant differences by asthma status.

See Table 3.1.5 at the end of this chapter for point estimates and confidence intervals for data presented in Figure 3.1.7.

Asthma and Physical Activity

People with asthma who participate in regular physical activity are less likely to have an asthma exacerbation and therefore more likely to utilize fewer health care services.[20, 21] The National Heart, Lung, and Blood Institute (NHLBI) Expert Panel Report 3 (EPR3) *Guidelines for the Diagnosis and Management of Asthma* recommends that people with asthma maintain a normal level of physical activity. For some people with asthma, physical activity can trigger an asthma episode or attack. These episodes/attacks can be avoided with proper asthma control and should not keep people with asthma from being physically active.

In 2008, the U.S. Department of Health and Human Services released guidelines for physical activity. These guidelines indicate adults should participate in at least two and one half hours (150 minutes) a week of moderate physical activity, or one hour and 15 minutes (75 minutes) of vigorous physical activity, or an equivalent combination of moderate and vigorous physical activity. The guidelines also indicate that those who participate in at least twice this amount of activity experience added health benefits and encourage adults to participate in muscle-strengthening activities at least two days a week.[22]

Adults can meet the 2008 physical activity recommendations by participating in as little as 30 minutes of moderate or 15 minutes of vigorous physical activity most days of the week.

For children and adolescents, the guidelines recommend 60 minutes of physical activity or more each day. Daily moderate or vigorous physical activity is best, with at least three days a week spent doing vigorous physical activity. Children and adolescents should also participate in muscle and bone-strengthening activities at least three days a week.[22]

For resources on how to increase physical activity levels, please visit the following sites:

- **Centers for Disease Control and Prevention, Physical Activity website at www.cdc.gov/physicalactivity**. This site contains information on how to improve individual physical activity levels, programs and interventions communities and organizations can implement to address physical activity, as well as policies that promote physical activity.

- For information on how **to increase individual physical activity levels visit www.health.gov/paguidelines/adultguide/part1.aspx.**

Health Care Providers can find useful information to help them talk to patients about being more physically active at: **www.health.gov/paguidelines/guidelines/chapter8.aspx**

Simple ways to become more physically active each day:

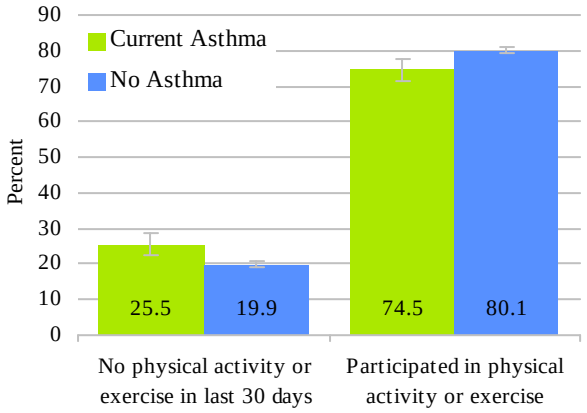
- Park farther away from work or the store and walk
- Take the stairs instead of the elevator
- Take three ten-minute walks per day (equals 30 minutes)
- Walk the dog
- Play tag with your children
- Dance to music

Prevalence of Physical Activity by Asthma Status:

In 2007-2008, there was a statistically significant difference in the percent of adults 18+ years old in New Hampshire who did not participate in physical activity in the last 30 days by asthma status. Adults with asthma had a higher prevalence of no physical activity compared with adult without asthma, at 25.5% versus 19.9%. A similar pattern is seen nationally.

Another way to look at the data is by examining the prevalence of asthma by physical activity status: among adults who did not participate in physical activity in the last 30 days an estimated 13% had asthma compared with 9.7% who did participate in physical activity; these differences are statistically significant (*See Table 3.3.1)*.

Figure 3.1.8
Two-year average prevalence of physical activity among adults 18+ years old by asthma status - New Hampshire, 2007-2008



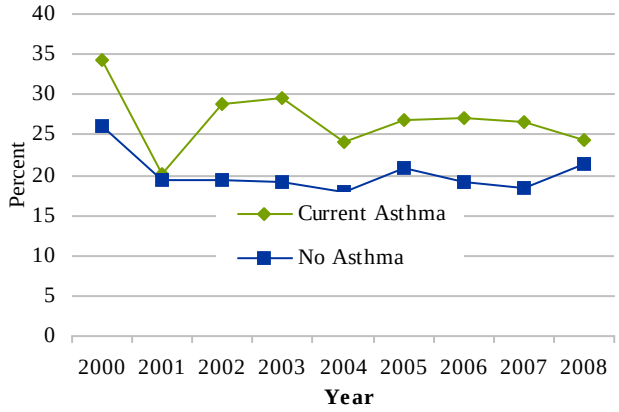
Data Source: 2007-2008 NH BRFSS

Trend in the Prevalence of Physical Activity by Asthma Status:

For each year between 2002 to 2007, there was a statistically significant difference in the prevalence of no physical activity in the last 30 days by asthma status; people with asthma had a higher prevalence of no physical activity compared with adults without asthma in each of these years.

Between 2000-2008, there were no statistically significant trends by asthma status in the prevalence of no physical activity.

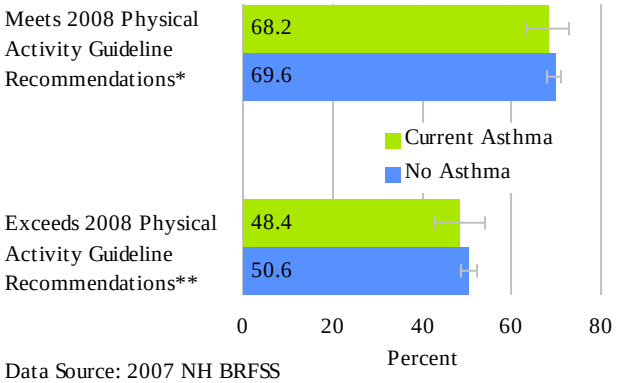
Figure 3.1.9
Trend in prevalence of no physical activity in the last 30 days among adults 18+ years old by asthma status - New Hampshire, 2000-2008



Data Source: 2000-2008 NH BRFSS

See Table 3.1.2 at the end of this chapter for point estimates and confidence intervals for data presented in Figure 3.1.8 and for national estimates. See Table 3.1.3 for point estimates, confidence intervals and trend analyses for data presented in Figure 3.1.9.

Figure 3.1.10
Percent of adults 18+ years old who participated in the recommended amount of physical activity by asthma status - New Hampshire, 2007



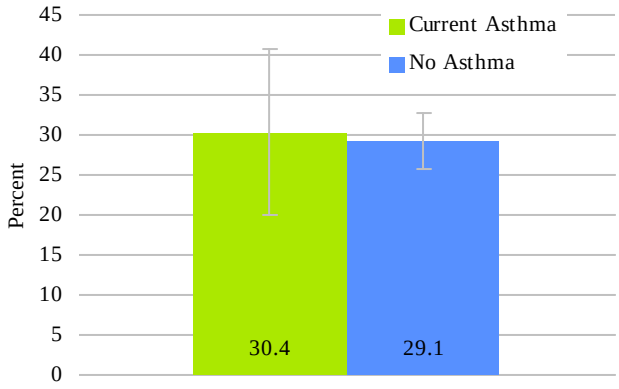
Data Source: 2007 NH BRFSS
* Participates in a least 150 minutes of moderate physical activity or 75 minutes of vigorous physical activity per week or equivalent combination of moderate and vigorous physical activity.
**Participates in at least twice the recommended amount of physical activity

Percent of Adults Who Participated in the Recommended Amount of Physical Activity by Asthma Status:

Approximately 2/3 of adults in New Hampshire with current asthma met the minimum guidelines for physical activity per week and nearly half participated in at least twice the recommended level of physical activity.

There are no statistically significant differences by asthma status in the percent of adults who met or exceeded the recommended levels of physical activity.

Figure 3.1.11
Percent of children 6-17 years old who participated in at least 20 minutes of physical activity every day in the past week by asthma status - New Hampshire, 2007



Data Source: 2007 NSCH

Percent of Children Who Participated in Physical Activity by Asthma Status:

Less than 1/3 of children participated in 20 minutes of physical activity every day whether they had asthma or not. The 2008 US Department of Health and Human Services guidelines for physical activity recommend children participate in at least 1 hour of physical activity every day.

There are no statistically significant differences by asthma status in the percent of children who participated in at least 20 minutes of daily physical activity.

See Table 3.1.8 at the end of this chapter for point estimates and confidence intervals for data presented in Figure 3.1.10 and Table 3.1.9 for data presented in Figure 3.1.11.

Asthma and Weight Status

The exact cause and effect relationship between asthma and obesity is complex and not fully understood.[23] Several studies have suggested that people who are obese are at increased risk of developing asthma in adulthood.[24-27] There is conflicting evidence about whether or not obesity increases asthma severity in either adults or children.[28-30] However, there is evidence that both children and adults with asthma who are overweight or obese tend to utilize more health care services,[24, 31] use more asthma medications,[24, 30] and experience an increase in symptoms,[24, 30] poorer control,[9, 30, 31] and lower quality of life compared with those who are not overweight or obese.[24, 31-33] Weight loss in overweight and obese people with asthma has been shown to reduce asthma symptoms, the need for medication, and improve airflow.[24, 34] Although it is not clear whether obesity is a primary risk factor for the development of asthma or simply exacerbates existing asthma, it has been shown to be an important source of respiratory morbidity.[26]

For resources to reach and maintain a healthy weight, please visit the following websites.

- **The NH Obesity Prevention Program (OPP)** **www.dhhs.nh.gov/dphs/nhp/obesity.htm** works on policy and environmental change to reduce and prevent obesity in New Hampshire. Their website provides physical activity and nutrition information for adults and children.
- **For worksite wellness resources visit** **www.dhhs.nh.gov/dphs/nhp/worksite/index.htm** to learn how worksites can support active living and healthy eating including information on how to support worksite breastfeeding.
- **HEAL (Healthy Eating, Active Living)** **www.healnh.org** links communities to strategies, tools and resources for creating healthy environments that help individuals and families make good choices where they live, learn, work and play.

Target Areas for Obesity Prevention

- Increase breastfeeding initiation, duration and exclusivity
- Increase physical activity
- Increase consumption of fruits and vegetables
- Decrease consumption of sugar-sweetened beverages
- Decrease consumption of energy-dense foods
- Decrease television viewing

Health Care Providers can visit 5-2-1-0 Healthy NH, a statewide public education campaign that provides clear, simple messages linked to the national guidelines for nutrition and physical activity for children. The messages focus on four behaviors:

5 Eat fruits and vegetables at least 5 times a day. Limit 100% fruit juice.
2 Cut screen time to 2 hours or less a day.
1 Participate in at least one hour of moderate to vigorous physical activity every day.
0 Restrict soda and sugar-sweetened sports and fruit drinks. Instead, drink water and 3-4 servings per day of fat-free (skim) or 1% milk.

5-2-1-0 Tools for Pediatric Primary Care
www.healthynh.com/fhc/initiatives/ch_obesity/5210.php.

Prevalence of Each Weight Status by Asthma Status:

In 2007-2008, there was a statistically significant difference in the percent of adults 18+ years old in New Hampshire who were obese by asthma status. Adults with asthma had a higher prevalence of obesity compared with adults without asthma, at 35.5% versus 24.0%. National estimates show a similar pattern.

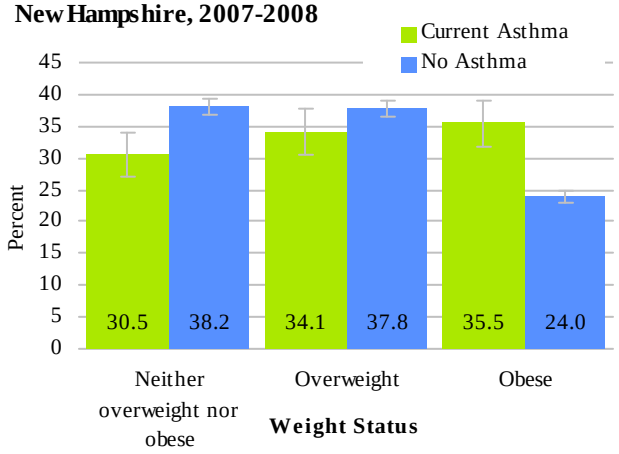
These data indicate that approximately one in three adults with current asthma were obese compared with one in four adults without asthma who were obese. The percentage of adults with asthma who are either overweight or obese was almost 70%.

Another way to look at the data is by examining the prevalence of asthma by weight status: among adults who were obese an estimated 14.5% have asthma compared with 9.3% who were overweight and 8.3% who were neither overweight nor obese; there was a statistically significant difference in the prevalence of asthma among adults who are obese compared with adults who are not obese. (*See Table 3.3.1).*

Trend in the Prevalence of Obesity by Asthma Status:

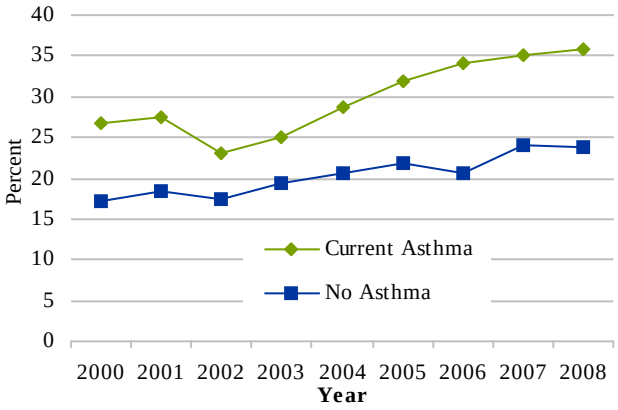
Between 2000-2008, there were statistically significant increasing trends in the prevalence of obesity among adults with and without current asthma.

Figure 3.1.12
Two-year average prevalence of weight status among adults 18+ years old by asthma status - New Hampshire, 2007-2008



Data Source 2007-2008 NH BRFSS

Figure 3.1.13
Trend in prevalence of obesity among adults 18+ years old by asthma status - New Hampshire, 2000-2008

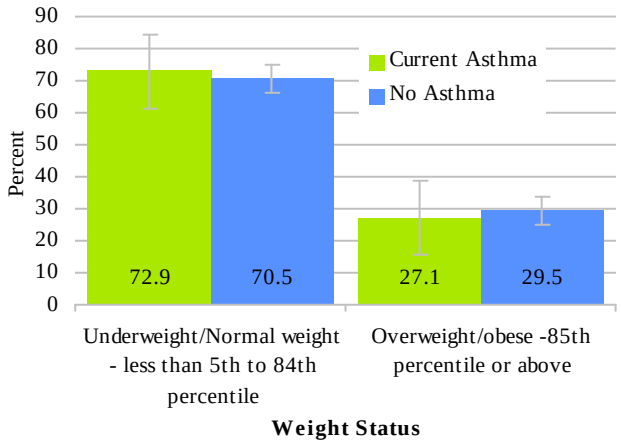


Data Source: 2000-2008 NH BRFSS

Based on the slopes of the best lines of fit from the trend analyses, it appears that the prevalence of obesity is increasing 1.9 times faster among adults with asthma as compared with adults who do not have asthma.

See Table 3.1.2 at the end of this chapter for point estimates and confidence intervals for data presented in Figure 3.1.12 and for national estimates. See Table 3.1.3 for point estimates, confidence intervals and trend analyses for data presented in Figure 3.1.13.

Figure 3.1.14
Prevalence of weight status among children 10-17 years old by asthma status - New Hampshire, 2007



Data Source: 2007 NSCH

Prevalence of Weight Status among Children by Asthma Status:

Weight status or body mass index (BMI) for children 10-17 years old is calculated based on their reported age, gender, height and weight.

In 2007 in New Hampshire, there were no statistically significant differences by asthma status in the prevalence of overweight/obese children 10-17 years old.

Overweight and obese weight categories were combined because the numbers were too small to analyze separately by asthma status.

See Table 3.1.10 at the end of this chapter for point estimates and confidence intervals for data presented in Figure 3.1.14.

3.2 Co-Morbidities

In general, co-morbid conditions are associated with more complex health care needs, including an increased need for medication and the increased possibility of drug interactions due to multiple drugs being used to treat multiple conditions.[35,36] Co-morbidities also have a significant impact on quality of life.[37]

Individuals with asthma are more likely to report other chronic conditions compared with people without asthma,[38,39] and many of the conditions reported are not respiratory conditions.[40] The National Heart, Lung, and Blood Institute (NHLBI) Expert Panel Report 3 (EPR 3) *Guidelines for the Diagnosis and Management of Asthma* recommends that health care providers evaluate patients for the presence of a chronic co-morbid condition when their asthma cannot be well controlled.

Asthma and Depression

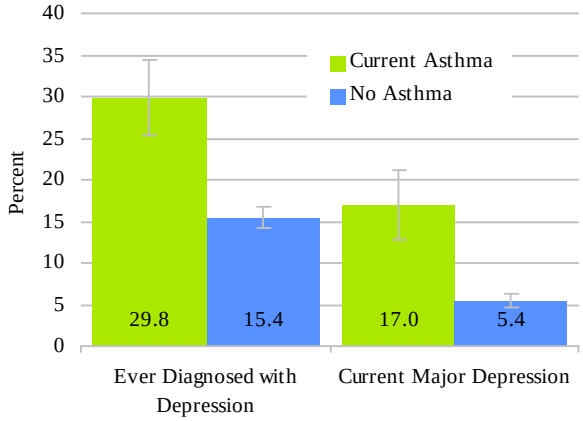
Adults and adolescents with asthma are almost twice as likely to have depression and/or anxiety disorders compared with those who do not have asthma.[41-43] Depression is associated with reduced treatment adherence[44-45] and poor health outcomes for people with asthma. Poor outcomes include an increased likelihood of poor asthma control [46-48] and risk of emergency department visits and hospitalization[47,49] as well as a lower quality of life.[46,47, 50-52]

Prevalence of Depression by Asthma Status:

In 2006 in New Hampshire, adults with current asthma were 1.9 times as likely as adults without asthma to report having ever been diagnosed with depression and 3 times more likely to currently have major depression.

Both the 2006-2008 BRFSS Adult Asthma Call-back Survey and 2006 BRFSS indicate that 30% of adults with current asthma have ever been diagnosed with depression - data from the Call-back Survey are not shown here. (*See Appendix B for methods used to define major depression.*)

Figure 3.2.1
Prevalence of depression among adults 18+ years old by asthma stataus - New Hampshire, 2006



Data Source: 2006 NH BRFSS

There are limited data on depression among New Hampshire children. Results from the 2009 New Hampshire Youth Risk Behavior Survey (NH YRBS) indicate that approximately 25% of high school students felt sad or hopeless for two or more weeks in the last year.[53] Data from the NH YRBS can not be stratified by asthma status.

Another way to look at the data is by examining the prevalence of asthma by depression status. Among adults who have ever been diagnosed with depression, 17.2% have asthma compared with 8.4% who have never been diagnosed with depression. Among adults who have major depression, 24.0% have asthma compared with 8.6% who do not have major depression. There are statistically significant differences in the prevalence of asthma for both these measures (*see Table 3.3.1).*

Asthma and COPD

While asthma and chronic obstructive pulmonary disease (COPD) are both respiratory conditions and share similar characteristics, such as coughing and wheezing, they are two distinct conditions in terms of disease onset, frequency of symptoms, reversibility of airway obstruction and pharmacologic treatment– particularly order of use and impact on outcomes. COPD also has significantly different systemic effects outside the respiratory tract, as well as significant and different co-morbid conditions. Whereas asthma occurs at any stage in life, COPD usually starts in the 4th or 5th decade of life and progresses insidiously in its incidence, prevalence and health impact; and while asthma patients can have near-normal lung function with proper treatment and be symptom-free between exacerbations,[56] COPD patients rarely experience a day without symptoms and airflow obstruction is at best partially reversible.[57]

COPD Prevalence by Asthma Status:

Studies have found that individuals with asthma are more likely than people without asthma to develop COPD.[54-55] Data from the 2008 NH BRFSS show that this is the case in New Hampshire as well.

The 2008, NH BRFSS results indicate that 17.6% of adults 18+ years old in New Hampshire who have asthma also report having COPD (*see Table 3.2.1).* A second data source, the 2006-2008 NH BRFSS Adult Asthma Call-back Survey, indicates that 27.4% (95% CI: 23.5-31.2) of adults with asthma reported having COPD. The questions used to determine COPD status were slightly different on the BRFSS and Call-back Survey, which may explain the differences in COPD prevalence rates found (*see the Glossary at the end of the chapter for the COPD definition used in each of these surveys).*

Based on the 2008 NH BRFSS, adults with asthma were 5 times more likely than adults without asthma to report also having COPD (*see Table 3.2.1).*

The prevalence of COPD increases as age increases. Nearly half of adults who were 65 years old and older and had asthma reported also having COPD (*see Table 3.2.1).*

Another way to look at the data is by examining the prevalence of asthma by COPD status: among adults who have COPD 36.0% have asthma compared with 9.0% who do not have COPD; these differences are statistically significant (*see Table 3.3.1).*

Table 3.2.1
Prevalence of COPD by asthma status - New Hampshire, 2008

	Current Asthma		No Asthma	
	Percent	95% CI	**Percent**	95% CI
Prevalence of COPD	**17.6**	14.4 - 20.9	**3.4**	2.9 - 4.0
Prevalence of COPD by age group				
18-44 years old	**9.0**	5.3 - 12.7	**1.5**	0.7 - 2.2
45-64 years old	**19.7**	14.5 - 24.9	**4.0**	3.1 - 4.9
65+ years old	**43.1**	34.0 - 52.2	**7.1**	5.6 - 8.5

Data Source: 2008 NH BRFSS

Asthma and Cardiovascular Disease, Diabetes, and Other Conditions

Asthma, diabetes, cardiovascular disease and other conditions share several risk factors (e.g., smoking, obesity, lack of physical activity), and many people with any one of these conditions are likely to have or develop a second or third.

Some studies have shown that adults with asthma have higher rates of cardiovascular disease,[39,58-59] stroke,[60] and other smoking-related conditions.[39] At least one study has suggested a relationship between diabetes and asthma.[61] Few studies have looked at co-morbid conditions among children with asthma, but one study indicates that children with asthma who are morbidly obese are more likely to develop insulin resistance compared with morbidly obese children without asthma.[62]

Prevalence of Cardiovascular Disease, Diabetes and Other Co-Morbid Conditions by Asthma Status:

In 2007-2008, adults 18+ years old in New Hampshire with asthma had a higher prevalence of diabetes compared with adults without asthma: 9.5% versus 6.9%. There is a statistically significant difference in the prevalence of diabetes by asthma status.

Among adults 45-64 years old there were statistically significant differences in the prevalence of angina or coronary heart disease, diabetes, and high blood pressure; adults with asthma had a higher prevalence of each of these conditions compared with adults without asthma.

Another way to look at the data is by examining the prevalence of asthma by these conditions. Among adults 18+ years old, there was a statistically significant difference in the prevalence of asthma only by diabetes status. Adults with diabetes had a higher prevalence of asthma compared with adults without diabetes, 13.6% versus 10.0% (*see Table 3.3.1).*

Table 3.2.2
Prevalence of cardiovascular disease, diabetes and other co-morbid conditions among adults 18+ years old by asthma status - New Hampshire 2007-2008

	Current Asthma		No Asthma	
	Percent	95% CI	**Percent**	95% CI
Angina or Coronary Heart Disease (2007-2008)	**5.8**	4.3 - 7.2	**4.2**	3.8 - 4.6
by age group				
18-44 years old	**1.2***	0.1 - 2.2	**0.7***	0.2 - 1.2
45-64 years old	**8.2**	4.9 - 11.4	**3.8**	3.1 - 4.4
65+ years old	**20.1**	14.7 - 25.6	**14.3**	12.8 - 15.7
Heart Attack (2007-2008)	**4.1**	2.7 - 5.5	**4.1**	3.7 - 4.5
by age group				
18-44 years old	**1.4***	0.0 - 2.8	**0.8***	0.3 - 1.3
45-64 years old	**4.8**	2.1 - 7.6	**4.3**	3.6 - 5.0
65+ years old	**13.8**	9.4 - 18.1	**12.0**	10.7 - 13.4
Stroke (2007-2008)	**2.8**	1.7 - 3.8	**2.3**	2.0 - 2.6
by age group				
18-44 years old	**1.4***	0.3 - 2.5	**0.7***	0.3 - 1.2
45-64 years old	**3.2***	0.7 - 5.7	**1.7**	1.3 - 2.2
65+ years old	**7.1**	4.1 - 10.2	**7.7**	6.6 - 8.8
Diabetes (2007-2008)	**9.5**	7.8 - 11.2	**6.9**	6.4 - 7.5
by age group				
18-44 years old	**4.1**	2.1 - 6.0	**1.7**	1.1 - 2.3
45-64 years old	**13.6**	10.4 - 16.9	**8.3**	7.4 - 9.3
65+ years old	**19.9**	14.7 - 25.1	**17.3**	15.7 - 18.8
High Blood Pressure (2007)	**27.5**	23.4 - 31.7	**26.2**	24.8 - 27.6
by age group				
18-44 years old	**13.6**	8.5 - 18.6	**9.8**	8.0 - 11.7
45-64 years old	**42.9**	35.6 - 50.1	**31.4**	29.2 - 33.7
65+ years old	**54.8**	45.4 - 64.2	**56.0**	53.0 - 58.9
High Cholesterol (2007)	**36.4**	31.4 - 41.3	**39.1**	37.3 - 40.8
by age group				
18-44 years old	**21.4**	14.6 - 28.2	**25.2**	22.1 - 28.4
45-64 years old	**50.0**	42.5 - 57.5	**43.9**	41.4 - 46.4
65+ years old	**54.7**	45.0 - 64.5	**55.1**	52.1 - 58.1

Data Source: 2007-2008 NH BRFSS
*Relative standard error is greater than 30% - interpret with caution.

Note: Because questions on the NH BRFSS vary from year to year, data from two years were examined, and data were combined if necessary to provide more stable estimates. The year(s) of analysis is provided in parentheses next to the indicator.

Supporting Tables

Table 3.1.2
Two-year average prevalence of asthma risk factors among adults 18+ years old by asthma status - New Hamsphire, 2007-2008

	New Hampshire				United States			
	Current Asthma		No Asthma		Current Asthma		No Asthma	
	Percent	95% CI	Percent	95% CI	Percent	95% CI	Percent	95% CI
Prevalence of smoking by asthma status [Figure 3.1.1]								
Current Smoker	**21.1**	18.0 - 24.2	**17.8**	16.8 - 18.8	**22.4**	21.8 - 23.0	**18.5**	18.3 - 18.7
Former Smoker	**30.3**	27.2 - 33.4	**30.6**	29.5 - 31.7	**26.0**	25.3 - 26.6	**24.2**	24.0 - 24.4
Never Smoked	**48.6**	45.0 - 52.3	**51.6**	50.3 - 52.8	**51.6**	50.9 - 52.4	**57.3**	57.0 - 57.5
Prevalence of physical activity by asthma status [Figure 3.1.8]								
No physical activity or exercise in last 30 days	**25.5**	22.4 - 28.5	**19.9**	18.9 - 20.8	**30.3**	29.6 - 31.0	**24.4**	24.2 - 24.6
Participated in physical activity or exercise	**74.5**	71.5 - 77.6	**80.1**	79.2 - 81.1	**69.7**	69.0 - 70.4	**75.6**	75.4 - 75.8
Prevalence of each weight by asthma status [Figure 3.1.12]								
Neither overweight nor obese	**30.5**	27.0 - 33.9	**38.2**	37.0 - 39.5	**31.8**	31.0 - 32.6	**37.8**	37.5 - 38.0
Overweight	**34.1**	30.5 - 37.7	**37.8**	36.6 - 39.1	**31.7**	30.9 - 32.4	**36.9**	36.7 - 37.2
Obese	**35.5**	31.9 - 39.0	**24.0**	22.9 - 25.0	**36.5**	35.7 - 37.3	**25.3**	25.1 - 25.5

Data Source: 2007-2008 BRFSS

*Data for the United States include estimates from the 50 states and the District of Columbia.

Table 3.1.3
Trends in the prevalence of asthma risk factors among adults 18+ years old by asthma status - New Hamsphire 2000-2008

		2000	2001	2002	2003	2004
Current Smoking [Figure 3.1.2]						
Current Asthma	**Percent**	**20.7**	**21.0**	**28.4**	**26.1**	**22.9**
	95% CI	13.8 - 27.5	15.9 - 26.0	23.2 - 33.5	20.8 - 31.4	18.3 - 27.4
No Asthma	**Percent**	**25.7**	**24.3**	**22.8**	**20.3**	**21.5**
	95% CI	23.2 - 28.2	22.6 - 25.9	21.3 - 24.2	18.9 - 21.7	19.9 - 23.0
No Physical Activity in Last 30 days [Figure 3.1.9]						
Current Asthma	**Percent**	**34.2**	**20.2**	**28.9**	**29.5**	**24.2**
	95% CI	26.1 - 42.2	15.7 - 24.7	23.8 - 33.9	24.5 - 34.5	20.0 - 28.3
No Asthma	**Percent**	**26.0**	**19.5**	**19.5**	**19.1**	**18.0**
	95% CI	23.6 - 28.5	18.0 - 21.0	18.1 - 20.8	17.7 - 20.4	16.7 - 19.3
Obesity [Figure 3.1.13]						
Current Asthma	**Percent**	**26.7**	**27.6**	**23.1**	**25.0**	**28.6**
	95% CI	19.2 - 34.2	21.6 - 33.5	18.6 - 27.6	20.1 - 30.0	23.9 - 33.4
No Asthma	**Percent**	**17.3**	**18.5**	**17.4**	**19.3**	**20.7**
	95% CI	15.1 - 19.5	17.0 - 19.9	16.1 - 18.6	18.0 - 20.7	19.2 - 22.1

Data Source: 2000-2008 NH BRFSS

*Unless otherwise noted, the trend analyses were conducted for the entire time period (2000 to 2008).
Slope (slope of the best line of fit claculated using JoinPoint Software) = the average percentage point increase or decrease per year (e.g., a slope of 1.0 indicates that the prevalence increased on average one pcercentage point per year).
P-values give the probability of finding no trend. A p-value of 0.05 or less is considered statistically significant becuase there is less than a 5% chance that there is no trend in the data.

Table 3.1.3 - continued

2005	2006	2007	2008	Trend Analysis* Slope	95% CI of slope	P-value
23.7 19.6 - 27.8	**17.4** 13.6 - 21.2	**25.0** 20.1 - 29.9	**17.2** 13.5 - 20.9	-0.75	-1.73 - 0.24	0.180
19.8 18.4 - 21.2	**18.3** 16.9 - 19.6	**18.6** 17.2 - 20.0	**17.0** 15.6 - 18.4	-0.97	-1.19 - -0.75	<0.0001
26.9 22.7 - 31.2	**27.0** 22.7 - 31.2	**26.6** 22.0 - 31.2	**24.3** 20.3 - 28.3	-0.08	-1.02 - 0.85	0.865
20.9 19.5 - 22.2	**19.1** 17.8 - 20.4	**18.5** 17.2 - 19.8	**21.3** 19.9 - 22.7	-0.09	-0.59 - 0.41	0.739
31.8 27.2 - 36.5	**34.1** 29.3 - 39.0	**35.2** 30.1 - 40.3	**35.7** 30.8 - 40.7	1.69	1.04 - 2.33	0.001
21.9 20.5 - 23.3	**20.5** 19.1 - 22.0	**24.1** 22.6 - 25.6	**23.8** 22.3 - 25.4	0.89	0.61 - 1.17	<0.001

Table 3.1.4
Percent of adult current smokers 18+ years old who have seen a health care provider in the last 12 months and been advised to quit smoking, and/or tried to stop smoking in the last 12 months, by asthma status - New Hampshire, 2005-2008

	Current Asthma		No Asthma	
	Percent	95% CI	**Percent**	95% CI
Current smokers who have seen a health care provider in the last 12 months who has advised them to quit smoking (2005-2006)				
Advised to Quit [Figure 3.1.3]	**78.6**	71.6 - 85.5	**71.8**	68.6 - 74.9
Not Advised	**21.4**	14.5 - 28.4	**28.2**	25.1 - 31.4
Current smokers who have tried to stop smoking for at least one day in the last 12 months (2007-2008)				
Tried to Stop Smoking [Figure 3.1.3]	**68.3**	60.3 - 76.3	**58.9**	55.9 - 62.0
Did Not Try to Stop Smoking	**31.7**	23.7 - 39.7	**41.1**	38.0 - 44.1

Data Source: 2005-2008 NH BRFSS
Note: Because questions on the NH BRFSS vary from year to year, data from four years were examined; the years the data were collected are provided in parentheses next to the indicator.

Table 3.1.5
Tobacco use and prevention, and exposure to secondhand smoke among middle and high school students by asthma status - New Hampshire, 2004, 2007 & 2009

	Middle School		High School	
	percent	95% CI	**percent**	95% CI
Ever Tried Smoking [Figure 3.1.4]				
Current Asthma	**24.6**	17.9 - 31.3	**42.0**	33.9 50.1
No Asthma	**15.1**	11.4 - 18.7	**46.5**	42.3 50.8
Current Smoker [Figure 3.1.4]				
Current Asthma	**6.8**	3.0 - 10.6	**21.9**	16.4 - 27.4
No Asthma	**4.5**	2.6 - 6.4	**23.1**	20.0 - 26.2
Health Care Provider talked about dangers of smoking [Figure 3.1.4]				
Current Asthma	**44.1**	36.8 - 51.4	**57.4**	50.7 - 64.0
No Asthma	**39.3**	35.2 - 43.4	**47.7**	44.4 - 51.1
*Lives with someone who smokes cigarettes** [Figure 3.1.7]				
Current Asthma	**34.8**	27.7 - 42.0	**29.8**	22.8 - 36.9
No Asthma	**34.7**	30.2 - 39.2	**33.8**	29.9 - 37.7
Smoking is allowed in home [Figure 3.1.7]				
Current Asthma	**31.5**	22.4 - 40.6	**17.0**	11.9 - 22.1
No Asthma	**22.0**	18.6 - 25.4	**23.4**	20.0 - 26.8
Was in the same room in the last 7 days as someone who was smoking [Figure 3.1.7]				
Current Asthma	**53.9**	46.2 - 61.6	**49.5**	42.5 - 56.5
No Asthma	**64.4**	60.4 - 68.3	**49.3**	44.8 - 53.8
Was in a car in the last 7 days with someone who was smoking [Figure 3.1.7]				
Current Asthma	**66.4**	59.4 - 73.5	**64.9**	57.9 - 71.9
No Asthma	**74.0**	70.6 - 77.4	**62.4**	58.7 - 66.0

Data Source: 2004 and 2007 Middle School YTS, 2009 High School YTS
Note: The Middle School YTS was not asked in 2009. Unless otherwise noted the Middle School data are from the 2007 Middle School YTS and the High School data are from the 2009 High School YTS.
*Middle School data are from the 2004 Middle School YTS; question was not asked in 2007.

Table 3.1.6
Percent of middle and high school students who were current smokers and tried to quit smoking in the last12 months - New Hampshire, 2004, 2007 & 2009 [Figure 3.1.5]

	Middle School		High School	
Year	**Percent**	95% CI	**Percent**	95% CI
2004	**47.8**	35.1 - 60.4	**48.6**	42.0 - 55.2
2007	**55.4**	45.3 - 65.4	**36.5**	31.7 - 41.4
2009	Not Asked		**49.6**	42.7 - 56.5

Data Source: 2004, 2007 & 2009 NH YTS

Note: The Middle School YTS was not conducted in 2009

Table 3.1.7
Percent of households where smoking is allowed in the home by adult asthma status - New Hampshire, 2001, 2003 & 2006 [Figure 3.1.6]

Year	Current Asthma		No Asthma		Total Population	
	Percent	95% CI	**Percent**	95% CI	**Percent**	95% CI
2001	**26.0**	20.6 - 31.4	**34.1**	32.3 - 35.9	**33.4**	31.7 - 35.1
2003	**27.2**	22.3 - 32.2	**27.0**	25.5 - 28.6	**26.9**	25.5 - 28.4
2006	**22.3**	18.1 - 26.5	**20.3**	18.9 - 21.7	**20.4**	19.1 - 21.7

Data Source: 2001, 2003 & 2006 NH BRFSS

Table 3.1.8
Percent of adults 18+ years old who participated in the recommended amount of physical activity by asthma status - New Hampshire, 2007

	Current Asthma		**No Asthma**		**State Total**	
	Percent	95% CI	**Percent**	95% CI	**Percent**	95% CI
*Meets 2008 Physical Activity Guideline Recommendations**						
Meets Guidelines [Figure 3.1.10]	**68.2**	63.4 - 72.9	**69.6**	68.0 - 71.2	**69.5**	68.0 - 71.0
Insufficient Activity to Meet Guidelines	**20.0**	16.0 - 23.9	**22.5**	21.0 - 24.0	**22.2**	20.9 - 23.5
Inactive	**11.9**	8.9 - 14.9	**7.9**	7.0 - 8.8	**8.3**	7.4 - 9.1
*Exceeds 2008 Physical Activity Guideline Recommendations***						
Exceeds Guidelines [Figure 3.1.10]	**48.4**	43.0 - 53.9	**50.6**	48.8 - 52.4	**50.3**	48.6 - 52.0
Does Not Meet Exceeds Guidelines Definition	**39.7**	34.3 - 45.0	**41.5**	39.7 - 43.2	**41.4**	39.8 - 43.0
Inactive	**11.9**	8.9 - 14.9	**7.9**	7.0 - 8.8	**8.3**	7.4 - 9.1

Data Source 2007 NH BRFSS

* Meets 2008 Physical Activity Guidelines = adults with 150 or more minutes of moderate physical activity per week or 75 or more minutes of vigorous activity per week or 150 minutes of combined moderate and vigorous physical activity per week.

**Exceeds 2008 Physical Activity Guidelines - adults with 300 or more minutes of moderate physical activity per week or 150 or more minutes of vigorous activity per week or 300 minutes of combined moderate and vigorous physical activity per week.

Table 3.1.9
Number of days children 6-17 years old participated in 20 minutes of physical activity in the past week - New Hampshire, 2007

		Current Asthma	No Asthma	Total Population
0 days	**Percent**	**9.1**	**7.9**	**8.0**
	95% CI	2.7 - 15.4	5.9 - 10.0	6.1 - 9.9
1-3 days	**Percent**	**24.2**	**28.1**	**27.4**
	95% CI	14.3 - 34.2	24.8 - 31.4	24.4 - 30.5
4-6 days	**Percent**	**36.3**	**34.9**	**35.6**
	95% CI	26.1 - 46.6	31.4 - 38.3	32.3 - 38.8
Every day	**Percent**	**30.4**	**29.1**	**29.0**
[Figure 3.1.11]	95% CI	20.0 - 40.7	25.6 - 32.6	25.8 - 32.2

Data Source: 2007 NSCH

Table 3.1.10
Prevalence of weight status among children 10-17 years old based on BMI for age by asthma status - New Hampshire, 2007 [Figure 3.1.14]

		Current Asthma	No Asthma
Underweight/Normal weight - less than 5th to 84th percentile	**Percent**	**72.9**	**70.5**
	95% CI	61.3 - 84.5	66.3 - 74.7
Overweight/obese - 85th percentile or above	**Percent**	**27.1**	**29.5**
	95% CI	15.5 - 38.7	25.3 - 33.7

Data Source: 2007 NSCH

Table 3.2.3
Prevalence of depression among adults 18+ years old by asthma status - New Hampshire, 2006 [Figure 3.2.1]

	Current Asthma		**No Asthma**	
	Percent	95% CI	**Percent**	95% CI
Ever Diagnosed with Depression				
Yes	**29.8**	25.3 - 34.4	**15.4**	14.1 - 16.8
No	**70.2**	65.6 - 74.7	**84.6**	83.2 - 85.9
Current Major Depression				
Yes	**17.0**	12.9 - 21.1	**5.4**	4.6 - 6.3
No	**83.0**	78.9 - 87.1	**94.6**	93.7 - 95.4

Data Source: 2006 NH BRFSS

Table 3.3.1
Prevalence of current asthma among adults 18+ years old by asthma risk factors and co-morbidities - New Hampshire, 2006-2008

	Percent	95% CI
Prevalence of current asthma by smoking status (2007-2008)		
Current Smoker	**12.0**	10.1 - 13.9
Former Smoker	**10.3**	9.1 - 11.4
Never Smoked	**9.8**	8.8 - 10.9
Prevalence of current asthma by physical activity status (2007-2008)		
No Physical Activity or Exercise in Last 30 Days	**13.0**	11.4 - 14.6
Had Physical Activity or Exercise in Last 30 Days	**9.7**	8.9 - 10.5
Prevalence of current asthma by weight status (2007-2008)		
Neither Overweight nor Obese	**8.3**	7.2 - 9.4
Overweight	**9.3**	8.1 - 10.5
Obese	**14.5**	12.8 - 16.1
Prevalence of current asthma by ever diagnosed with depression (2006)		
Diagnosed with Depression	**17.2**	14.3 - 20.0
Never Diagnosed with Depression	**8.4**	7.4 - 9.4
Prevalence of current asthma by depression status (2006)		
Major Depression	**24.0**	18.4 - 29.7
No Major Depression	**8.6**	7.6 - 9.6
Prevalence of current asthma by COPD (2008)		
COPD	**36.0**	30.4 - 41.5
No COPD	**9.0**	8.0 - 10.0
Prevalence of current asthma by Angina or Coronary Heart Disease (2007-2008)		
Angina or Coronary Heart Disease	**13.6**	10.4 - 16.8
No Angina or Coronary Heart Disease	**10.2**	9.4 - 10.9
Prevalence of current asthma by heart attack (2007-2008)		
Heart Attack	**10.5**	7.2 - 13.8
No Heart Attack	**10.3**	9.6 - 11.0
Prevalence of current asthma by stroke (2007-2008)		
Stroke	**12.0**	7.6 - 16.5
No Stroke	**10.3**	9.6 - 11.0
Prevalence of current asthma by diabetes (2007-2008)		
Diabetes	**13.6**	11.2 - 15.9
No Diabetes	**10.0**	9.3 - 10.8
Prevalence of current asthma by high blood pressure (2007)		
High Blood Pressure	**10.7**	9.0 - 12.4
No High Blood Pressure	**10.1**	8.9 - 11.4
Prevalence of current asthma by high cholesterol (2007)		
High Cholesterol	**9.5**	8.0 - 10.9
No High Cholesterol	**10.4**	9.0 - 11.8

Data Source: 2006-2008 BRFSS

Note: Because questions on the NH BRFSS vary from year to year, data three years were examined, and data were combined if necessary to provide more stable estimates. The year(s) of analysis is provided in parentheses next to the indicator.

Glossary

Smoking Indicators for Adults

Current Smoker	=	Proportion of respondents who answered "Yes" to "Have you smoked at least 100 cigarettes in your entire life?" and "Every day or Some days" to "Do you now smoke cigarettes every day, some days, or not at all?" Data Source: NH BRFSS - Figures 3.1.1 - 2
Former Smoker	=	Proportion of respondents who answered "Yes" to "Have you smoked at least 100 cigarettes in your entire life?" and "Not at All" to "Do you now smoke cigarettes every day, some days, or not at all?" Data Source: NH BRFSS - Figures 3.1.1
Never Smoked	=	Proportion of respondents who answered "No" to "Have you smoked at least 100 cigarettes in your entire life?" Data Source: NH BRFSS - Figures 3.1.1
Advised to Quit Smoking in the Last 12 Months by a Health Care Provider	=	Proportion of current smokers as defined above who answered "1 or more times" to "In the last 12 months, how many times have you seen a doctor, nurse or other health professional to get any kind of care for yourself?" and "1 or more times" to "In the last 12 months, on how many visits were you advised to quit smoking by a doctor or other health provider?" Data Source: NH BRFSS - Figures 3.1.3
Tried to Stop Smoking in the Last 12 Months	=	Proportion of current smokers as defined above who answered "Yes" to "During the past 12 months, have you stopped smoking for one day or longer because you were trying to quit smoking?" Data Source: NH BRFSS - Figures 3.1.3

Smoking Indicators for Youth

Ever Tried Smoking	=	Proportion of respondents who answered "Yes" to "Have you ever tried cigarette smoking, even one or two puffs?" and/or "Yes" to "Have you ever tried smoking cigars, cigarillos, or little cigars, even one or two puffs?" and/or answered "Bidis, Kreteks, or I have tried both bidis and kreteks" to the question "Have you ever tried smoking any of the following? Bidis, Kreteks, I have tried both bidis and kreteks, or I have never smoked bidis or kreteks" Data Source: NH YTS - Figure 3.1.4
Current Smoker	=	Proportion of respondents who answered "1 or more days" to one or more of the following questions: "During the past 30 days, on how many days did you smoke cigarettes?", "During the past 30 days, on how many days did you smoke cigars, cigarillos, or little cigars?", "During the past 30 days, on how many days did you smoke tobacco in a pipe?", and "During the past 30 days, on how many days did you smoke bidis?" Data Source: NH YTS - Figure 3.1.4
Health Care Provider Talked about Dangers of Smoking	=	Proportion of respondents who answered "Yes" to "During the past 12 months, did any doctor, dentist, nurse, or other health professional advise you not to smoke?" Data Source: NH YTS - Figure 3.1.4
Tried to Quit Smoking in last 12 Months	=	Proportion of current smokers as defined above who answered "1 or more times" to " How many times during the past 12 months have you stopped smoking for one day or longer because you were trying to quit smoking?" Data Source: NH YTS - Figure 3.1.5

Exposure to Secondhand Smoke

Smoking is Allowed in the Home	=	Proportion of respondents who answered B,C, or D to "Which statement best describes the rules about smoking inside your home?" A) Smoking is not allowed anywhere inside your home, B) Smoking is allowed in some places or at some times, C) Smoking is allowed anywhere inside the home, or D) There are no rules about smoking inside the home Data Source: NH BRFSS - Figure 3.1.6 and NH YTS - Figure 3.1.7
Someone in Household Smokes Tobacco	=	Proportion of respondents who answered "Yes" to "Does anyone living in your household use cigarettes, cigars, or pipe tobacco?" Data Source: NSCH - Table 3.1.1
Exposure to Secondhand Smoke in Home	=	*No one uses tobacco* = Proportion of respondents who answered "No" to "Does anyone living in your household use cigarettes, cigars, or pipe tobacco?" *Someone Smokes but Not Inside the Home* = Proportion of respondents who answered "Yes" to "Does anyone living in your household use cigarettes, cigars, or pipe tobacco?" and "No" to "Does anyone smoke inside [Child's Name]'s home?" *Someone Smokes Inside the Home* = Proportion of respondents who answered "Yes" to both "Does anyone living in your household use cigarettes, cigars, or pipe tobacco?" and "Does anyone smoke inside [Child's Name]'s home?" Data Source: NSCH - Table 3.1.1
Lives with Someone Who Smokes Cigarettes		Proportion of respondents who answered "Yes" to "Does anyone who lives with you now smoke cigarettes?" Data Source: NH YTS - Figure 3.1.7
Was in the Same Room in the Last 7 Days as Someone Who Was Smoking	=	Proportion of respondents who answered "1 or more days" to "During the past 7 days, on how many days were you in the same room with someone who was smoking cigarettes?" Data Source: NH YTS - Figure 3.1.7
Was in a Car in the Last 7 Days with Someone Who Was Smoking	=	Proportion of respondents who answered "1 or more days" to "During the past 7 days, on how many days did you ride in a car with someone who was smoking cigarettes?" Data Source: NH YTS - Figure 3.1.7
Exposure to Secondhand Smoke in the Home in the Last Week	=	Proportion of respondents who answered "Yes" to "In the past week, has anyone smoked inside your home?" Data Source: NH BRFSS Adult and Child Call-back Surveys - Included in Summary for Findings on page 3-6

Physical Activity Indicators

No Physical Activity in the Last 30 Days	=	Proportion of respondents who answered "No" to "During the past month, other than your regular job, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise?" Data Source: NH BRFSS - Figures 3.1.8 - 9
Participated in Physical Activity in the Last 30 Days	=	Proportion of respondents who answered "Yes" to "During the past month, other than your regular job, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise?" Data Source: NH BRFSS - Figures 3.1.8
Meets 2008 Physical Activity Guideline Recommendations	=	Proportion of respondents who participated in at least 150 minutes of moderate activity, or at least 75 minutes of vigorous activity, or at least 150 minutes of a combination of moderate and vigorous activity in the last week. This measure is calculated based on respondents answers to the following 6 questions: "In a usual week [when you are not working], do you do moderate activities for at least 10 minutes at a time, such as ... that cause some increase in breathing or

Continue... Meets 2008 Physical Activity Guideline Recommendations	=	or heart rate?" "How many days per week do you do these moderate activities for at least 10 minutes at a time?" "On days when you do moderate activities for at least 10 minutes at a time, how much total time per day do you spend doing these activities?" "In a usual week [when you are not working], do you do vigorous activities for at least 10 minutes at a time ... That cause large increases in breathing or heart rate?" "How many days per week do you do these vigorous activities for at least 10 minutes at a time?" "On days when you do vigorous activities for at least 10 minutes at a time, how much total time per day do you spend doing these activities?" Data Source: NH BRFSS - Figure 3.1.10
Insufficient Activity to Meet Guidelines		Proportion of respondents who participated in moderate and/or vigorous activity in episodes of at least 10 minutes but did not accrue an equivalent combination of 150 minutes of moderate-intensity activity per week. This measure is calculated based on respondent answers to the 6 question list above in the "Meets 2008 Physical Activity Guideline Recommendations" indicator. Data Source: NH BRFSS - Table 3.1.8
Inactive		Proportion of respondents who reported no moderate or vigorous activity in episodes of at least 10 minutes. This measure is calculated based on respondent answers to the 6 question list above in the "Meets 2008 Physical Activity Guideline Recommendations" indicator. Data Source: NH BRFSS - Table 3.1.8
Exceeds 2008 Physical Activity Guideline Recommendations	=	Proportion of respondents who participated in at least 300 minutes of moderate activity, or at least 150 minutes of vigorous activity, or at least 300 minutes of a combination of moderate and vigorous activity in the last week. This measure is calculated based on respondent answers to the question list above in the "Meets 2008 Physical Activity Guideline Recommendations" indicator. Data Source: NH BRFSS - Figure 3.1.10
Does Not Meet Exceeds Guidelines Definition		Proportion of respondents who participated in moderate and/or vigorous activity in episodes of at least 10 minutes but did not accrue an equivalent combination of 300 minutes of moderate-intensity activity per week. This measure is calculated based on respondent answers to the 6 question list above in the "Meets 2008 Physical Activity Guideline Recommendations" indicator. Data Source: NH BRFSS - Table 3.1.8
At Least 20 Minutes of Physical Activity Every Day	=	Proportion of respondents who responded "7 days" to "During the past week, on how many days did [child's name] exercise, play a sport, or participate in physical activity for at least 20 minutes that made [him/her] sweat and breathe hard?" Data Source: NSCH- Figure 3.1.11

Weight Status Indicators - for adults

Obese	=	Proportion of respondents whose body mass index (BMI) is greater than or equal to 30. BMI is calculated based on reported height and weight. Data Source: NH BRFSS - Figure 3.1.12-13
Overweight	=	Proportion of respondents whose body mass index (BMI) is greater than or equal to 25 and less than 30. BMI is calculated based on reported height and weight. Data Source: NH BRFSS - Figure 3.1.12
Normal Weight/ Underweight	=	Proportion of respondents whose body mass index (BMI) is less than 25. BMI is calculated based on reported height and weight. Data Source: NH BRFSS - Figure 3.1.12

Weight Status Indicators - for children

Assessment of body fat in children and teenagers is approached differently than for adults. Children's body fat composition changes as they grow, and growth patterns are different for boys and girls. Consequently, measurement of body mass for children, known as BMI-for-age, is age and gender specific. Current information about BMI-for-age is available from the CDC online at: http://www.cdc.gov/healthyweight/assessing/bmi/childrens_bmi/about_childrens_bmi.html/. BMI-for-age calculation requires the child's age in months and is based on parents' recollection of the selected child's height and weight. . Since the NSCH reports age only in years, all children were assumed to be at the midpoint of their age-year for this calculation. Weight indicators for children were limited to those 10-17 years old because a study comparing parent-reported height and weight from the 2003 NSCH with results from the National Health and Nutrition Examination Survey (NHANES) revealed that parents typically overestimate height and underestimate weight of children younger than 10 years of age. As a result it was determined that BMI calculations based on reported height and weights from parents was unreliable for children less than 10 years old. (Akinbami LJ, Ogden CL. Childhood Overweight Prevalence in the United States: The Impact of Parent-reported Height and Weight. Obesity. 2009; 17: 1574-1580).

Underweight/ Normal Weight - Less than 5th to 84th Percentile	=	Calculated based on responses to age, gender, height and weight questions. Children who fell in the less than 5th to 84th percentile for their age and gender were classified as underweight/normal weight. Data Source: NSCH - Figure 3.1.14
Overweight/Obese - 85th Percentile or Above	=	Calculated based on responses to age, gender, height and weight questions. Children who fell in the 85th percentile or above for their age and gender were classified as overweight/obese. Data Source: NSCH - Figure 3.1.14

Co-morbidity Indicators

Ever Diagnosed with Depression	=	Proportion of respondents who answered "Yes" to "Has a doctor or other healthcare provider EVER told you that you have a depressive disorder (including depression, major depression, dysthymia, or minor depression)?" Data Source: NH BRFSS - Figure 3.2.1
Current Major Depression	=	Calculated based on responses to eight questions. The questions asked are a slightly modified version of the Patient Health Questionnaire-9 (PHQ-9); the modified version is referred to as PHQ-8. Responses to the questions are scored and a score of 10 or higher is considered "current major depression". See Appendix B: Technical Notes and Methods located at www.dhhs.nh.gov/dphs/cdpc/asthma/publications.htm, for more information on this measure. Data Source: NH BRFSS - Figure 3.2.1
COPD	=	Proportion of respondents who answered "Yes" to "Have you ever been told by a doctor or health professional that you have chronic obstructive pulmonary disease (COPD), emphysema or chronic bronchitis?" Data Source: NH BRFSS - Table 3.2.1 OR Proportion of respondents who answered "Yes" to any one of the following 3 questions: "Have you ever been told by a doctor or health professional that you have chronic obstructive pulmonary disease also known as COPD?", "Have you ever been told by a doctor or other health professional that you have emphysema?," or "Have you ever been told by a doctor or other health professional that you have chronic bronchitis?" Data Source: NH BRFSS Adult Asthma Call-back Survey - Included in text on page 3.16.
Angina or Coronary Heart Disease	=	Proportion of respondents who answered "Yes" to "Has a doctor, nurse or other health professional ever told you that you had angina or coronary heart disease?" Data Source: NH BRFSS - Table 3.2.2

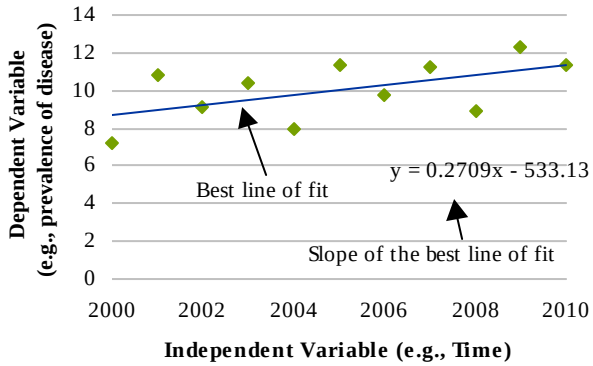
Co-morbidity Indicators - continued

Heart Attack	=	Proportion of respondents who answered "Yes" to "Has a doctor, nurse or other health professional ever told you that you had a heart attack, also called a myocardial infarction?" Data Source: NH BRFSS - Table 3.2.2
Stroke	=	Proportion of respondents who answered "Yes" to "Has a doctor, nurse or other health professional ever told you that you had a stroke?" Data Source: NH BRFSS - Table 3.2.2
Diabetes	=	Proportion of respondents who answered "Yes" to "Have you ever been told by a doctor that you have diabetes?" (If "Yes" and respondent is female, ask "Was this only when you were pregnant?") Those who had diabetes only when pregnant were excluded from the measure. Data Source: NH BRFSS - Table 3.2.2
High Blood Pressure	=	Proportion of respondents who answered "Yes" to "Have you ever been told by a doctor, nurse or other health professional that you have high blood pressure?" (If "Yes" and respondent is female, ask "Was this only when you were pregnant?") Those who had high blood pressure only when pregnant were excluded from the measure. Data Source: NH BRFSS - Table 3.2.2
High Cholesterol	=	Proportion of respondents who answered "Yes" to "Have you ever been told by a doctor, nurse or other health professional that your blood cholesterol is high?" Data Source: NH BRFSS - Table 3.2.2

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

Best Line of Fit	A line of best 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	Is 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.

Example 1: Scatter Plot



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