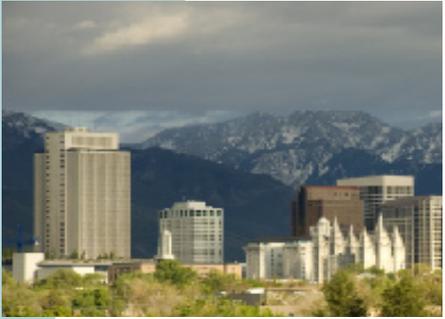


# Asthma in Utah

## Burden Report 2009



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# Table of Contents

---

List of Figures.....	1
List of Tables.....	4
Executive Summary.....	5
Utah Asthma Plan.....	9
Healthy People 2010 Objectives .....	11
Asthma Prevalence.....	13
Age and Sex.....	13
Ethnicity and Race.....	15
Education and Income.....	16
Geography.....	17
Age at First Diagnosis.....	18
Trends Over Time.....	19
Asthma Management and Quality of Life.....	21
Symptoms.....	21
Missed Work and School Days.....	25
Asthma Knowledge.....	27
Medication Use.....	28
Routine Care.....	30
Influenza Vaccinations.....	31
Indoor Environmental Factors That Affect Asthma.....	33
Asthma in Utah Schools.....	35
Health Care Utilization for Asthma.....	39
Asthma Hospitalizations.....	39
Asthma-related Emergency Department Visits.....	41
Costs of Care.....	44

# Table of Contents

---

Asthma Mortality.....	47
Occupational Asthma.....	51
Asthma in the Medicaid Population.....	53
Health Care Utilization for Asthma.....	53
HEDIS Measures.....	57
References.....	59
Appendices.....	60
Appendix A: Data Sources.....	60
Appendix B: Technical Notes and Methodology.....	64

# List of Figures

---

- Figure 1. Prevalence of Lifetime Asthma by Age and Sex, Utah, 2007
- Figure 2. Prevalence of Current Asthma by Age and Sex, Utah, 2007
- Figure 3. Prevalence of Current Asthma by Ethnicity, Utah Adults, 2003-2007
- Figure 4. Prevalence of Current Asthma by Race, Utah Adults, 2003-2007
- Figure 5. Prevalence of Current Asthma by Educational Level, Utah Adults 25 and Over, 2007
- Figure 6. Prevalence of Current Asthma by Level of Income, Utah Adults 18 and Over, 2007
- Figure 7. Prevalence of Current Asthma by Local Health District, Utah Adults, 2003-2007
- Figure 8. Age at First Diagnosis Among Adults With Lifetime Asthma, Utah, 2007
- Figure 9. Age at First Diagnosis Among Adults With Lifetime Asthma by Sex, Utah, 2007
- Figure 10. Prevalence of Current Asthma Among Adults Aged 18 and Over, U.S. and Utah, 2001-2007
- Figure 11. Most Recent Asthma Symptoms, Adults and Children With Current Asthma, Utah, 2007
- Figure 12. Number of Days With Asthma Symptoms During Past 30 Days, Utah Adults With Current Asthma, 2007
- Figure 13. Number of Days of Lost Sleep in the Past 30 Days Due to Symptoms of Asthma, Utah Adults With Current Asthma, 2006 and 2007
- Figure 14. Activity Limitations Due to Asthma During Past 12 Months, Utah Adults and Children With Current Asthma, 2007
- Figure 15. Students Whose Activities Were Limited One or More Times Per Week Due to Asthma Symptoms, Utah Students With Current Asthma, 2003, 2005, and 2007
- Figure 16. Asthma Attack During Past 12 Months, Utah Residents With Current Asthma, 2006 and 2007
- Figure 17. Received Urgent Treatment for Asthma During Past 12 Months, Adults and Children With Current Asthma, Utah, 2007
- Figure 18. Number of Days Unable to Work or Carry Out Usual Activities During Past 12 Months, Adults With Current Asthma, Utah, 2006-2007

## List of Figures

---

Figure 19. Number of Missed School Days Due to Asthma During Past 12 Months, Utah School Aged Children With Current Asthma, 2007

Figure 20. Students Who Missed at Least 1 Day of School Per Month Due to Asthma, Utah Students With Current Asthma, 2003, 2005, and 2007 Combined

Figure 21. Asthma Self-management Knowledge, Adults and Children With Lifetime Asthma, Utah, 2007

Figure 22. Taught to Use Inhaler by a Health Professional, Adults and Children Who Ever Used an Inhaler, Utah, 2007

Figure 23. Length of Time Since Last Asthma Medication Was Taken, Adults and Children With Current Asthma, Utah, 2007

Figure 24. Number of Routine Asthma Checkups During Past 12 Months, Utah Adults With Current Asthma, 2007

Figure 25. Received Routine Asthma Checkup During Past 12 Months, Utah Residents With Current Asthma, 2007

Figure 26. Percentage Who Received an Influenza Vaccination According to Asthma Status, Utah Adults, 2007

Figure 27. Percentage Who Received an Influenza Vaccination, Utah Children Ages 0-17 With Current Asthma, 2007

Figure 28. Environmental Triggers in the Homes of Adults and Children With Current Asthma, Utah, 2007

Figure 29. Environmental Modifications in the Homes of Adults and Children With Current Asthma, Utah, 2007

Figure 30. Asthma Action Plan and Medicine at School, Utah School-Aged Children With Current Asthma, 2007

Figure 31. Asthma Hospitalizations by Age and Sex, Utah Children Ages 0-17, 2007

Figure 32. Asthma Hospitalizations by Age and Sex, Utah Adults Ages 18 and Over, 2007

## List of Figures

Figure 33. Asthma Hospitalizations by Local Health District, Utah Residents, 2003-2007

Figure 34. Asthma Hospitalizations, Utah Residents, 2003-2007

Figure 35. Asthma Emergency Department Treat and Release Visits, Utah Children Ages 0-17, 2006

Figure 36. Asthma Emergency Department Treat and Release Visits, Utah Adults Ages 18 and Over, 2006

Figure 37. Asthma Emergency Department Treat and Release Visits by Local Health District, Utah, 2002-2006

Figure 38. Asthma Emergency Department Treat and Release Visits, Utah Residents, 2002-2006

Figure 39. Asthma Hospitalization Charges by Primary Source of Payment, Utah, 2007

Figure 40. Emergency Department Treat and Release Encounter Charges by Primary Source of Payment, Utah, 2006

Figure 41. Number of Asthma Deaths by Age, Utah Residents, 2001-2007

Figure 42. Asthma Mortality Rates by Age, Utah Residents, 2001-2007

Figure 43. Asthma Mortality Rates by Year, Utah Residents, 2001-2007

Figure 44. Asthma Mortality Rates by Year and Sex, Utah Residents, 2001-2007

Figure 45. Prevalence of Work-related Asthma Among Adults With Lifetime Asthma, Utah, 2007

Figure 46. Inpatient Hospitalization Rates for Asthma Among the Utah Medicaid Population by Age and Sex, 2008

Figure 47. Emergency Department Encounter Rates for Asthma Among the Utah Medicaid Population by Age and Sex, 2008

# List of Figures and Tables

---

Figure 48. Outpatient Visit Rates for Asthma Among the Utah Medicaid Population by Age and Sex, 2008

Figure 49. Inpatient Hospitalization, Emergency Department, and Outpatient Visit Rates for Asthma by Sex, Utah, 2008

Figure 50. HEDIS Measure: Use of Appropriate Medications for People With Persistent Asthma, Ages 5-56 Years, Utah, 2004-2008

Figure 51. HEDIS Measure: Use of Appropriate Medications for People With Persistent Asthma by Age Group, Utah, 2008

## List of Tables

Table 1. Asthma Medication Use Among Adults and Children With Current Asthma, Utah, 2007

Table 2. Asthma Management School-level Impact Measures, Utah, 2008

Table 3. Number of Asthma Hospitalizations, Average Length of Stay, Average Charge per Hospitalization, and Total Hospitalization Charges for Asthma by Sex and Age, Utah Residents, 2007

Table 4. Number of Asthma Emergency Department Treat and Release Encounters, Average Charge per Encounter, and Total Treat and Release Encounter Charges for Asthma by Sex and Age, Utah Residents, 2006

Table 5. Utah Medicaid Recipients Continuously Enrolled in 2008

The *Asthma in Utah Burden Report 2009* utilizes data from various sources to provide a clear picture of the burden of asthma in the state. This report is intended to assist all those working to lessen this burden to better understand the situation in Utah. With enhanced understanding through data, individuals and families affected by asthma can better manage their situations and asthma episodes can be prevented

whenever possible. As strategies to address the asthma burden are based upon sound information, the mission of the Utah Asthma Task Force “Utah communities working together to improve the quality of life for people with asthma” will be realized.

## Executive Summary

### Background

Asthma is a serious personal and public health issue that has far-reaching medical, economic, and psychosocial implications. The burden of asthma can be seen in the number of asthma-related medical events, including emergency department visits, hospitalizations, and deaths. Both economically and socially, the burden of asthma can be seen in the treatment costs associated with asthma, the number of school and work days missed due to asthma conditions, loss of sleep, and limitation of life activities. Ultimately, persons with asthma report a lower quality of life as compared to persons without asthma. This reality underscores the urgent need for a clear understanding of the burden and the steps that can be taken to alleviate it.

Recognizing the growing burden of asthma on Utah citizens, the Utah Department of Health applied for funding from the Centers for Disease Control and Prevention (CDC) in 2001. The cooperative funding agreement is designed to allow states to develop the capacity to address asthma from a public health perspective. Utah was awarded funding in 2001 and created the Utah Asthma Program and Asthma Task Force. Continued funding was received through a renewal of the cooperative agreement with the CDC in 2007 and has enabled continued expansion of the capacity of the Utah Asthma Task Force.

The goals of the Utah Asthma Program include enhancing infrastructure to address asthma from a public health perspective, maintenance of an asthma surveillance system, continuing to build partnerships within the community, and implementing population-based strategies to improve asthma care and management. All aspects of these efforts are contained in the Utah Asthma Plan (see page 9), which was revised in 2006-2007. The Asthma in Utah report connects with key aspects of the Utah Asthma Plan by providing baseline data for decision-making processes.

# Executive Summary

## Key Findings

The following findings highlight some of the primary areas essential to understanding the effects of asthma on the Utah population.

- ▶ The age-adjusted prevalence of current asthma for persons 18 and over in 2007 was 8.2% in Utah, which was similar to the national estimate of asthma prevalence.
- ▶ In 2007, females in the 50-64 age group (11.8%) and males in the 0-17 age range (8.7%) had the highest prevalence of current asthma.
- ▶ Among adults 18 and over of different ethnicities, the current asthma prevalence for the Hispanic population (4.8%) was the lowest and nearly half the prevalence for the state and other ethnic populations for 2003-2007.
- ▶ During 2007, males 1-4 years old had the highest rate (22.3 per 10,000) of asthma hospitalizations of any age group for males and females; it was nearly twice as high as the next highest rate.
- ▶ Of Utah's 12 local health districts (generally classified as four urban and eight rural), half of the rural and half of the urban districts had hospitalization rates for asthma higher than the overall state rate for 2003-2007.
- ▶ In 2007, 11.6% of adults with current asthma reported visiting an emergency room for asthma during the past 12 months.
- ▶ More than 1 in 10 adults with current asthma (12.1%) reported losing sleep on 5 or more days during the past month due to asthma symptoms.
- ▶ For adults who suffer from asthma, 18.0% reported experiencing asthma symptoms every day during the past 30 days.
- ▶ One-third of school-aged children with current asthma (33.8%) missed at least one day of school during the past 12 months due to asthma symptoms.

## Executive Summary

- ▶ Nearly three times as many males reported having been told by a health professional that their asthma was work-related (6.7%) when compared to females (2.3%).
- ▶ More than one-fifth of individuals who have ever been diagnosed with asthma reported having left a job because it caused or worsened their asthma symptoms (21.4%).
- ▶ The rate of deaths due to asthma among persons ages 75 years and older (18.3 per 100,000 Utah residents) was more than four times greater than the rate among any other age group for 2003-2007.
- ▶ From 2001 to 2007, the rate of deaths due to asthma for all ages declined by nearly half (47.8%), from 2.3 to 1.2 deaths per 100,000 Utah residents.
- ▶ In 2008, the use of appropriate asthma medications was higher among individuals with commercial managed care plans for every age group when compared to Medicaid managed care plans.
- ▶ Among the Medicaid population, females in the 35-49 age group experienced the highest emergency department visit rate for asthma (12.6 per 1,000), which was more than twice the rate for nearly all other groups by age and sex.

# Executive Summary

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## Asthma Problem at a Glance

Asthma is a chronic condition that involves increased difficulty in breathing due to airway inflammation and constriction caused by sensitivity to a variety of environmental triggers. Exposure to a trigger (e.g., cold air, cigarette smoke) causes the airways to produce excessive mucus and the muscles to constrict. Such airway obstruction can usually be reversed with treatment and may also reverse spontaneously after removal of the trigger or by removing the person from the triggering situation. Signs of asthma include coughing, wheezing (whistling or rattling sound while breathing), trouble catching one's breath, dizziness, and tightness in the chest.

The periodic breathing problems caused by asthma are called an “asthma attack” or “asthma episode.” An asthma attack may require medication or some other form of treatment for normal breathing to be restored. In many cases, there are warning signs for asthma attacks that can alert the individual before an episode actually occurs. Knowing the symptoms of asthma and treating those symptoms early on can help prevent more serious episodes from occurring or from occurring on a frequent basis.

Asthma “triggers” can set off asthma episodes and include: cold or dry air, dust, pollen, pollution, cigarette smoke, stress, or physical activity.

The reality of the burden of asthma upon the population in Utah has become more apparent through continued surveillance. Data collected through the asthma surveillance system and interactions with partners in the Utah Asthma Task Force have provided greater clarity about the problem of asthma in Utah families.

## Introduction

In October 2006, members of the Utah Asthma Task Force convened an all-day workshop to make important revisions to the Utah Asthma Plan. They identified areas of interest and developed objectives and strategies to reduce hospitalizations due to asthma and the overall burden of asthma in Utah. In particular, they have focused their efforts further on populations with poorly controlled asthma.

Goals and objectives for the revised asthma plan more closely address these populations for the future.

## Utah Asthma Plan

The vision statement was updated by the Task Force and reads as follows:

*Utah communities working together to improve the quality of life for people with asthma.*

The following work groups and mission statements were created to fulfill this vision:

### Asthma Management:

To assist people with asthma to improve their quality of life by providing the tools and resources necessary to maximize and promote wellness.

### Health Systems:

To assist the health care system in providing access to appropriate care as defined by National Asthma Education and Prevention Program (NAEPP) Guidelines.

### Population Issues:

Within population systems, provide culturally-appropriate assistance for those affected by asthma so they can better manage the disease within their social and physical environments.

# Utah Asthma Plan

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## Risk Factors:

Identify asthma risk factors and promote intervention strategies to reduce those risks in Utah.

## Data and Monitoring:

To assure availability of quality data to guide interventions that improve the quality of life for people with asthma.

The *Asthma in Utah Burden Report 2009* contains asthma surveillance data that will help guide interventions to achieve the goals and objectives of the Utah Asthma Plan.

## Introduction

---

Healthy People 2010 (HP2010) is a comprehensive set of disease prevention and health promotion objectives for the nation. The Utah Asthma Program and Task Force have worked over the past five years to achieve the objectives contained in HP2010. This effort will continue and the burden report is part of

the ongoing information needed to track such measures. The asthma objectives are found below.

## Healthy People 2010 Objectives

- 24-1. Reduce asthma deaths.
- 24-2. Reduce hospitalizations due to asthma.
- 24-3. Reduce hospital emergency department visits due to asthma.
- 24-4. Reduce activity limitations among persons with asthma.
- 24-5. Reduce the number of school or work days missed by persons with asthma due to asthma.
- 24-6. Increase the proportion of persons with asthma who receive formal patient education, including information about community and self-help resources, as an essential part of the management of their condition.
- 24-7. Increase the proportion of persons with asthma who receive appropriate asthma care according to NAEPP guidelines.



# Asthma Prevalence

Asthma prevalence is one of the foremost indicators to measure and track the burden of disease among population groups. Tracking asthma prevalence across age groups, geographic areas, income and education levels, by gender, and by racial and ethnic groups makes it possible to target the most vulnerable sections of the population. For example, Utah has a higher prevalence of asthma among low-income populations, Native Americans, and in certain urban and rural health districts when

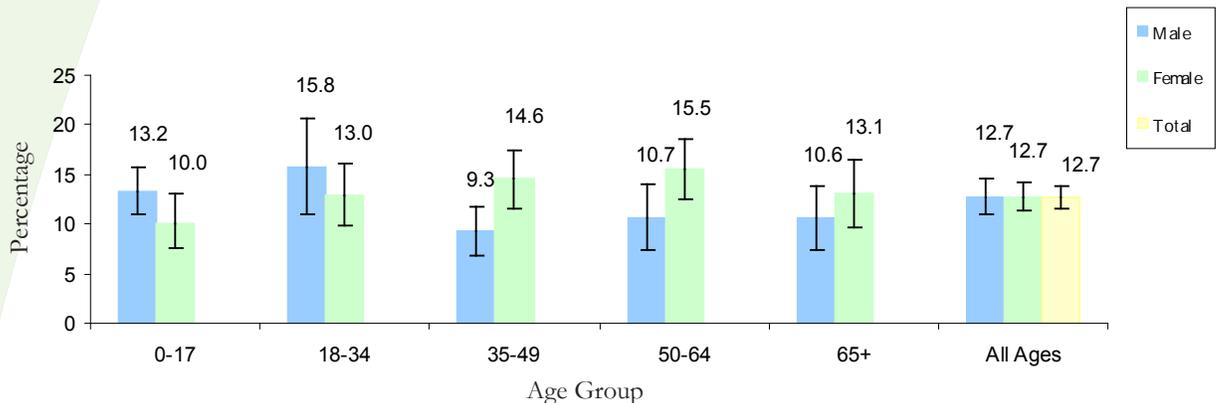
compared to the overall asthma prevalence in the state.

Since 2001, asthma prevalence has been increasing in Utah, which is similar to increasing trends nationwide. The 2007 age-adjusted prevalence of current asthma among adults in Utah was 8.2%, which was similar to the nationwide estimate (see Figure 10).

## Asthma Prevalence

### Prevalence by Age and Sex

Figure 1. Prevalence of Lifetime Asthma by Age and Sex, Utah, 2007

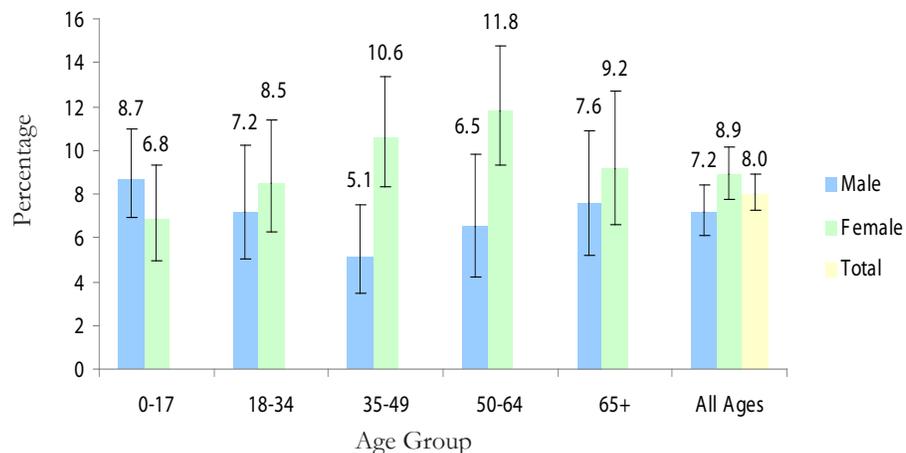


Source: Utah Behavioral Risk Factor Surveillance System, 2007. Crude prevalence.

Lifetime asthma is defined as having ever been diagnosed with asthma by a doctor or other health professional. In 2007, 12.7% of Utahns reported having been diagnosed with asthma sometime during their life. Females ages 35 and older appeared to have a higher prevalence of lifetime asthma when compared to males, though differences were not statistically significant.

# Prevalence

Figure 2. Prevalence of Current Asthma by Age and Sex, Utah, 2007

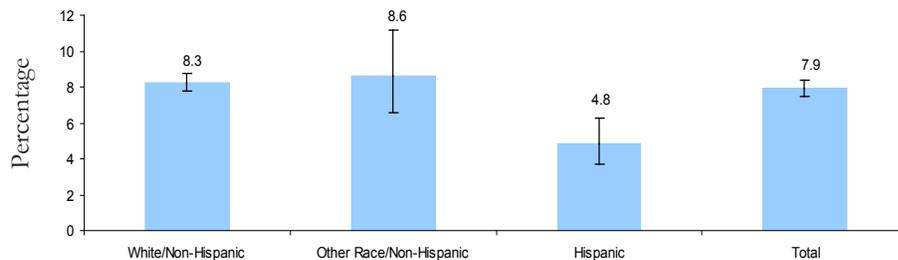


Source: Utah Behavioral Risk Factor Surveillance System, 2007. Crude prevalence.

Current asthma is defined as those who have ever been diagnosed with asthma by a doctor or other health professional and who report that they still have asthma. Overall, 8.0% of Utahns reported having current asthma in 2007. Males ages 0-17 appeared to have a higher prevalence of asthma when compared to females. For adults ages 18 and older, females seemed to have a higher prevalence of asthma for every age group. However, the only significant difference in asthma prevalence between males and females was found among adults ages 35-49.

## Prevalence by Ethnicity and Race

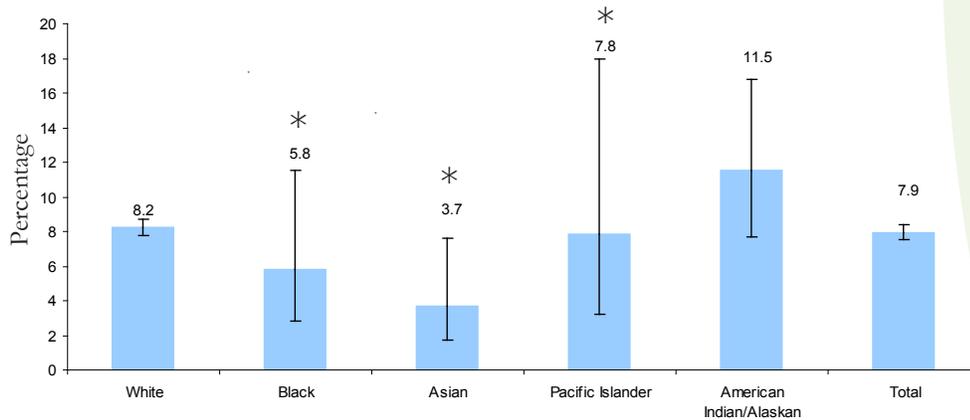
Figure 3. Prevalence of Current Asthma by Ethnicity, Utah Adults, 2003-2007



Source: Behavioral Risk Factor Surveillance System, 2003-2007 combined. Age-adjusted prevalence.

Asthma prevalence varied among ethnic populations in Utah. Hispanics reported nearly half the prevalence of current asthma (4.8%) when compared to non-Hispanics [White/non-Hispanic (8.3%) and Other race/non-Hispanic (8.6%)] and to the adult population as a whole (7.9%). Due to small ethnic minority populations in Utah, several years of data were combined to obtain reliable estimates.

Figure 4. Prevalence of Current Asthma by Race, Utah Adults, 2003-2007



Source: Utah Behavioral Risk Factor Surveillance System, 2003-2007 combined. Age-adjusted prevalence.

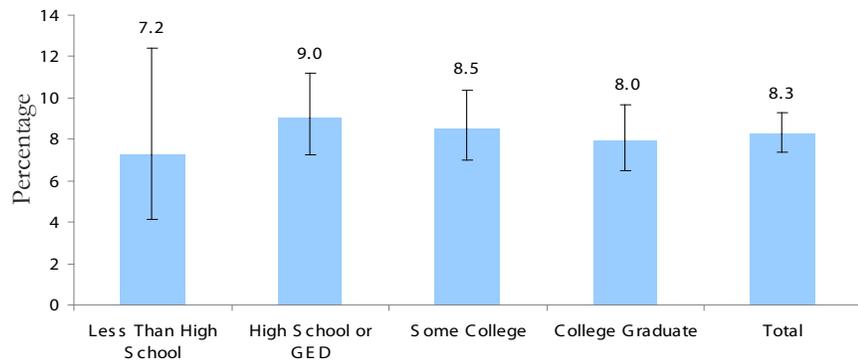
\* Estimate has a coefficient of variation greater than 30% and does not meet Utah Department of Health standards for reliability.

Asthma prevalence also differed among population groups of different races. Asians appeared to have the lowest prevalence of asthma (3.7%), while American Indian/Alaska Natives seemed to experience the highest prevalence (11.5%) when compared to the statewide prevalence (7.9%), although the differences were not statistically significant. Asthma prevalence among the Asian population was significantly lower than the prevalence for American Indians/Alaska Natives and Whites (8.2%). Due to small racial minority populations in Utah, several years of data were combined.

# Prevalence

## Prevalence by Education and Income

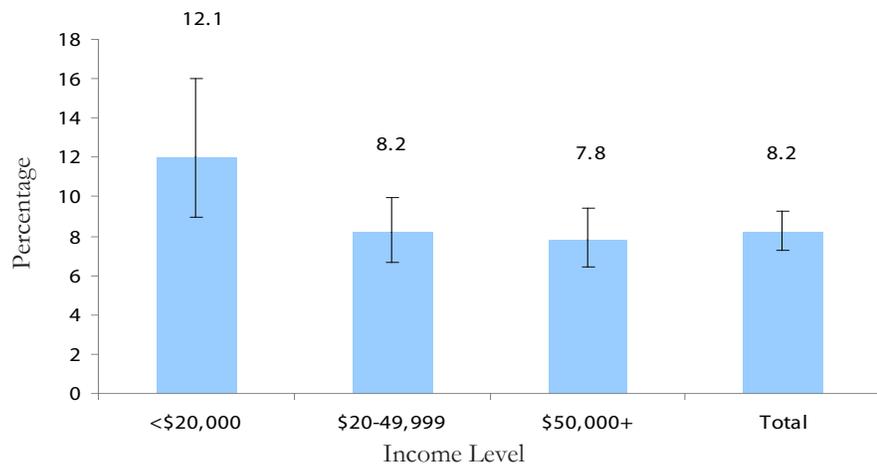
Figure 5. Prevalence of Current Asthma by Education Level, Utah Adults 25 and Over, 2007



Source: Utah Behavioral Risk Factor Surveillance System, 2007. Age-adjusted prevalence.

Asthma prevalence was compared among adults ages 25 and older reporting varying levels of educational achievement. No differences in asthma prevalence were found based on educational level, suggesting that education alone is not a determinant of asthma prevalence.

Figure 6. Prevalence of Current Asthma by Level of Income, Utah Adults 18 and Over, 2007



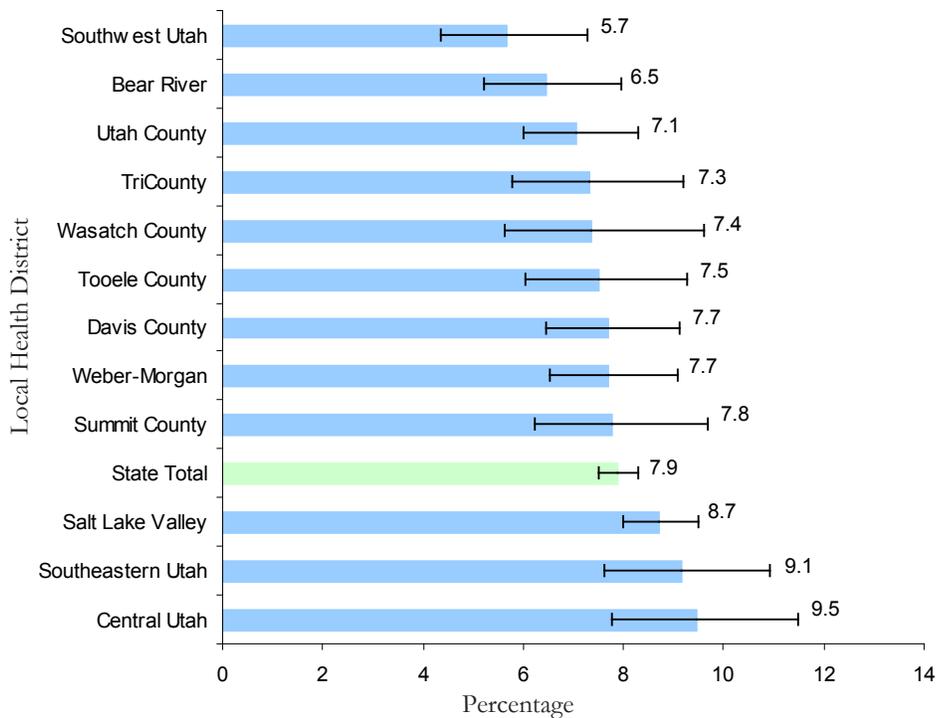
Source: Utah Behavioral Risk Factor Surveillance System, 2007. Age-adjusted prevalence.

Adults reporting a household income of less than \$20,000 a year had a higher prevalence of current asthma (12.1%) when compared to the general Utah adult population (8.2%). Asthma prevalence appeared to decrease with increasing income levels, although differences between income levels were not statistically significant. However the data suggests that low income may be a contributing factor in the development or continuance of asthma.

# Prevalence

## Prevalence by Local Health District

Figure 7. Prevalence of Current Asthma by Local Health District, Utah Adults, 2003-2007



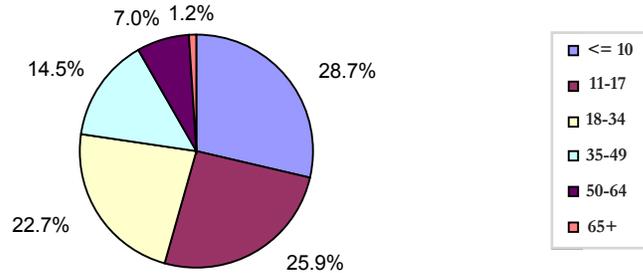
Source: Utah Behavioral Risk Factor Surveillance System, 2003-2007 combined. Age-adjusted prevalence.

Some differences in asthma prevalence were found between local health districts (LHDs) in Utah. Southwest Utah LHD had the lowest prevalence (5.7%), which was significantly lower than the state estimate (7.9%), Southeastern Utah (9.1%) and Central Utah (9.5%) LHDs. Both Southwest Utah and Bear River LHDs (6.5%) had a statistically lower prevalence of asthma when compared to Salt Lake Valley (8.7%). Asthma prevalence was similar among other LHDs.

# Prevalence

## Age at Diagnosis

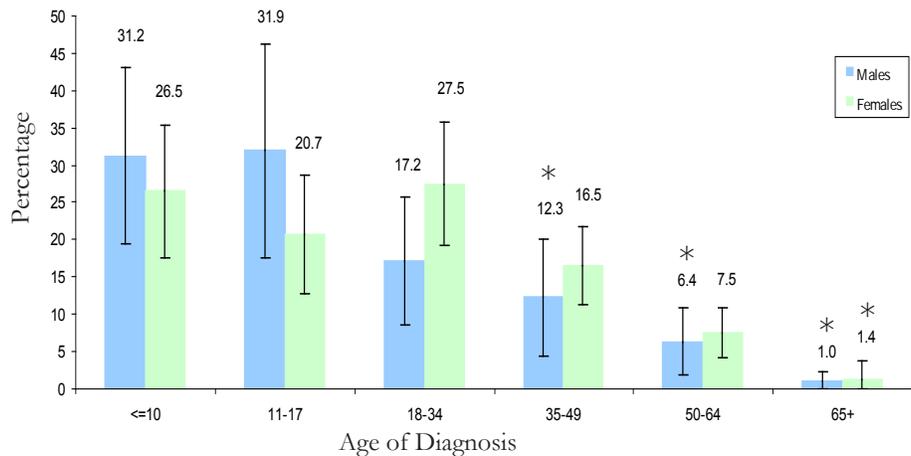
Figure 8. Age at First Diagnosis Among Adults With Lifetime Asthma, Utah, 2007



Source: Utah Behavioral Risk Factor Surveillance System Call-back Survey, 2007. Crude prevalence.

The majority of Utah adults who have ever been diagnosed with asthma (54.6%) were diagnosed by age 17. More than three-quarters of adults (77.3%) reported having been diagnosed by the age of 34 and only 8.2% were diagnosed after the age of 50.

Figure 9. Age at First Diagnosis Among Adults With Lifetime Asthma by Sex, Utah, 2007



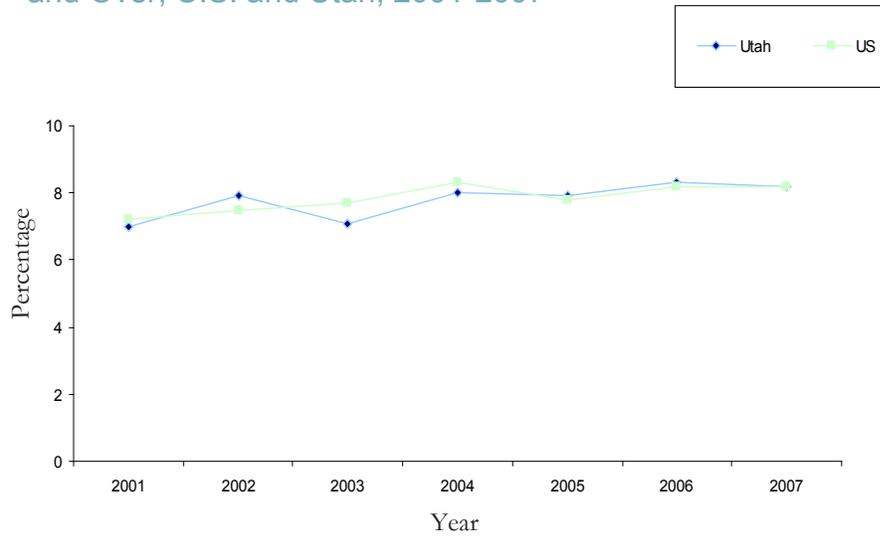
Source: Utah Behavioral Risk Factor Surveillance System Call-back Survey, 2007. Crude prevalence.

\* The estimate has a coefficient of variation greater than 30% and does not meet Utah Department of Health standards for reliability.

Nearly two-thirds of males (63.1%) who have ever been diagnosed with asthma were diagnosed by age 17, compared to less than half of females (47.2%) who had been diagnosed by that age. For age groups 18 years and older, it appeared that a higher percentage of females were diagnosed compared to males among every age group. While these data suggest that males tend to be diagnosed with asthma at younger ages than females, differences in age at diagnosis between sexes were not statistically significant.

## Trends Over Time

Figure 10. Prevalence of Current Asthma Among Adults Aged 18 and Over, U.S. and Utah, 2001-2007



Source: U.S. and Utah Behavioral Risk Factor Surveillance System, 2001-2007. Age-adjusted prevalence.

The prevalence of asthma in Utah has been generally increasing over time, rising by 17.1% between 2001 (7.0%) and 2007 (8.2%). This is similar to national trends of increasing asthma prevalence.



# Asthma Management and Quality of Life

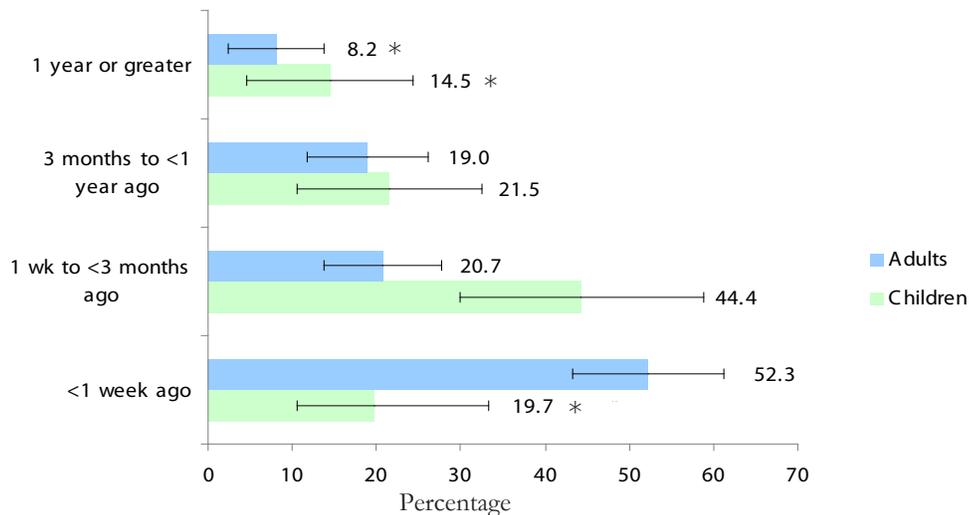
Frequency and severity of asthma symptoms and quality of life are indicators of one's management of asthma. People with well-controlled asthma should not experience symptoms such as wheezing or coughing, lost sleep, missed work or school, inability to participate in physical activities, and hospitalizations due to asthma.<sup>1</sup> Through appropriate medication use, medical care, and self-management, the majority of asthma symptoms are preventable.<sup>2</sup> Data in the Asth-

ma Management and Quality of Life section provide information on asthma management in Utah. They support the Utah Asthma Plan by helping to achieve the following objectives: "Increase awareness of how asthma affects daily life activities" and "improve access to asthma management systems."

## Asthma Management and Quality of Life

### Symptoms

Figure 11. Most Recent Asthma Symptoms, Adults and Children With Current Asthma, Utah, 2007



Source: Utah Behavioral Risk Factor Surveillance System Call-back Survey, 2007. Crude prevalence.

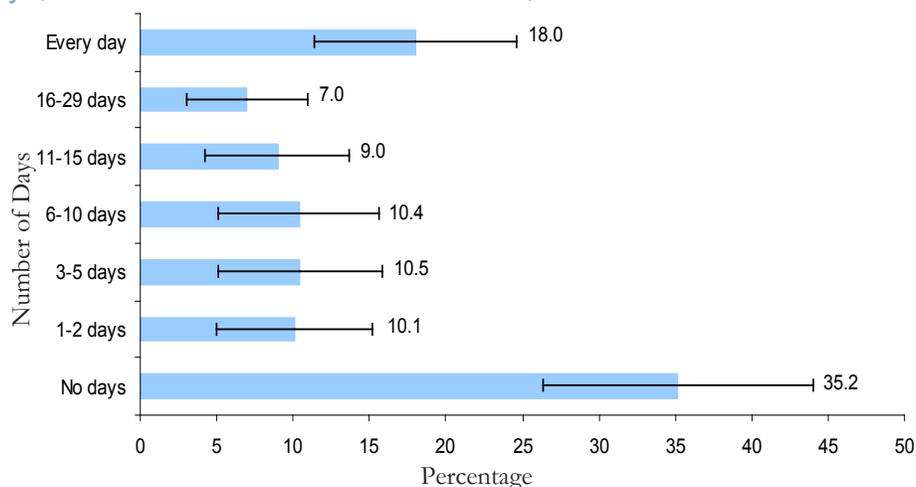
\*The estimate has a coefficient of variation greater than 30% and does not meet Utah Department of Health standards for reliability.

Over half (52.3%) of adults experienced their most recent asthma symptom less than one week ago, compared to only 19.7% of children with symptoms within the past week. Nearly one in 10 adults (8.2%) and 14.5% of children with current asthma reported remaining symptom-free during the past year.

Some of the differences in symptoms experienced by children versus adults may be due to a difference in reporting methods for the two age groups. Asthma symptoms for children were reported by a parent or guardian, while adult symptoms were self-reported.

# Asthma Management and Quality of Life

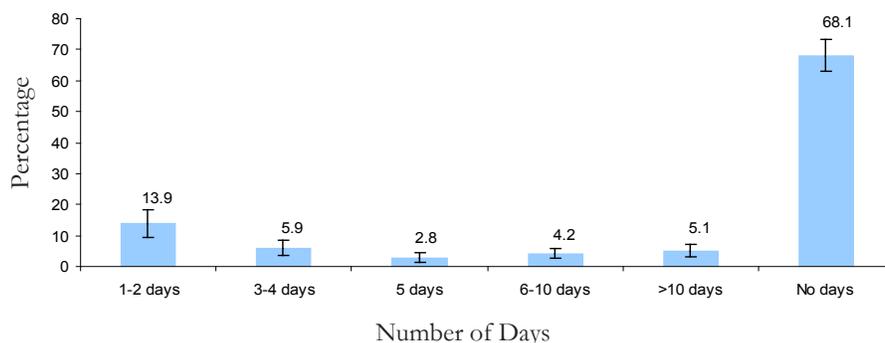
Figure 12. Number of Days With Asthma Symptoms During Past 30 Days, Utah Adults With Current Asthma, 2007



Source: Utah Behavioral Risk Factor Surveillance System Call-back Survey, 2007. Crude prevalence.

Adults with current asthma were asked to report the number of days they experienced asthma symptoms during the past 30 days. Over one-third of respondents said they experienced no asthma symptoms (35.2%). Nearly one-fifth (18.0%) reported experiencing asthma symptoms every day.

Figure 13. Number of Days of Lost Sleep in the Past 30 Days Due to Symptoms of Asthma, Utah Adults With Current Asthma, 2006 and 2007

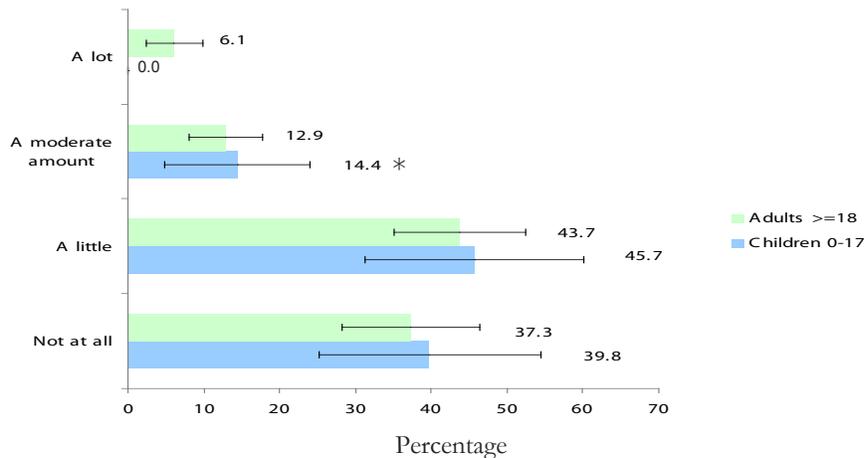


Source: BRFSS, 2006 Adult Asthma History Module and 2007 Call-back Survey combined. Crude prevalence.

Adults with current asthma were asked how many days they have lost sleep during the past 30 days due to asthma symptoms. Nearly one-quarter (22.6%) reported having lost 1-5 days of sleep during the past 30 days. The majority of adults (68.1%) reported no days of lost sleep due to asthma.

# Asthma Management and Quality of Life

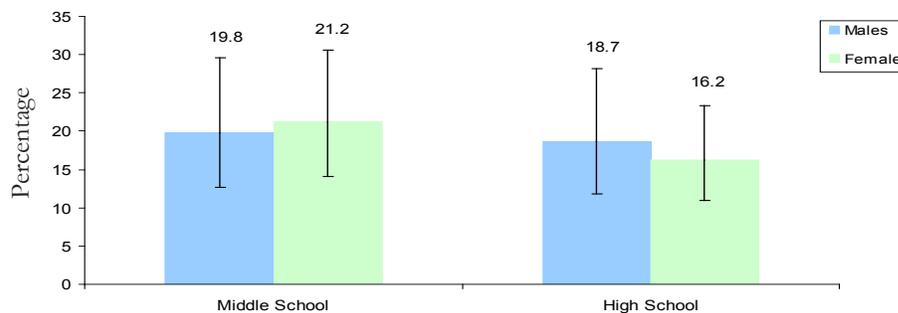
Figure 14. Activity Limitations Due to Asthma During Past 12 Months, Utah Adults and Children With Current Asthma, 2007



Source: Utah Behavioral Risk Factor Surveillance System Call-back Survey, 2007. Crude prevalence.  
 \* The estimate has a coefficient of variation >30% and does not meet Utah Department of Health standards for reliability.

Individuals with asthma were asked if their asthma had limited their activities a lot, a moderate amount, a little, or not at all during the past 12 months. Nearly half of respondents indicated that their activities had been limited a little due to asthma (43.7% of adults, 45.7% of children). Over one-third reported no activity limitations (37.3% of adults, 39.8% of children).

Figure 15. Students Whose Activities Were Limited One or More Times per Week Due to Asthma Symptoms, Utah Students With Current Asthma, 2003, 2005, and 2007

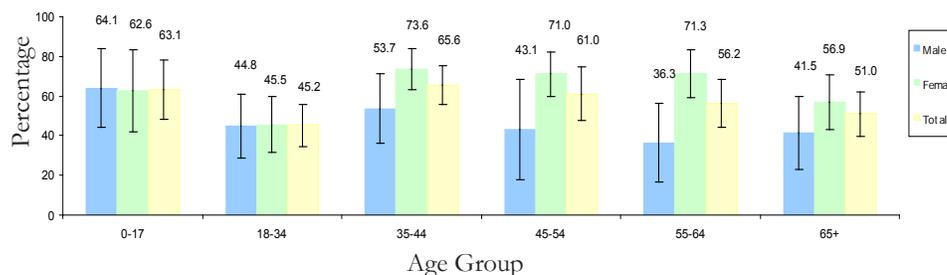


Source: Utah Youth Tobacco Survey, Utah, 2003, 2005, and 2007 combined.  
 Note: Current asthma includes those with doctor-diagnosed asthma who had an asthma attack in the past 12 months.

Middle and high school students were asked about the frequency of activity limitations due to asthma symptoms during the past 12 months. Nearly one-fifth of middle and high school students with current asthma said they experienced activity limitations at least one time per week due to asthma symptoms.

# Asthma Management and Quality of Life

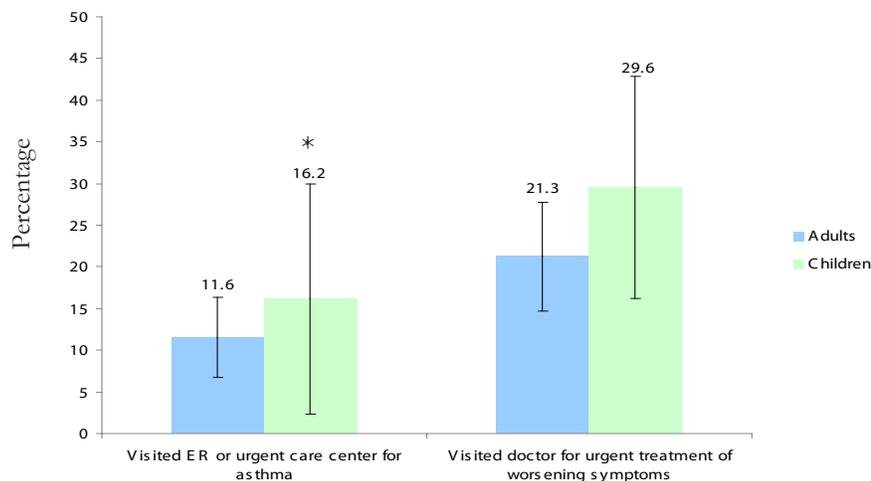
Figure 16. Asthma Attack During Past 12 Months, Utah Residents With Current Asthma, 2006 and 2007



Source: Ages 18 and older: BRFSS, 2006 Adult Asthma History Module and 2007 Call-back Survey combined. Ages 0-17: 2007 Call-back Survey. Crude prevalence.

Among adults ages 35 years and older, a higher percentage of females appeared to have experienced an asthma attack during the past 12 months compared to males, though the difference between males and females was statistically significant only for age group 55-64 (36.3% for males, 71.3% for females). A significantly higher percentage of adults ages 35-44 (65.6%) experienced an asthma attack compared to adults ages 18-34 (45.2%).

Figure 17. Received Urgent Treatment for Asthma During Past 12 Months, Adults and Children With Current Asthma, Utah, 2007



Source: Utah Behavioral Risk Factor Surveillance System Call-back Survey, 2007. Crude prevalence.

\* The estimate has a coefficient of variance >30% and does not meet Utah Department of Health standards for reliability.

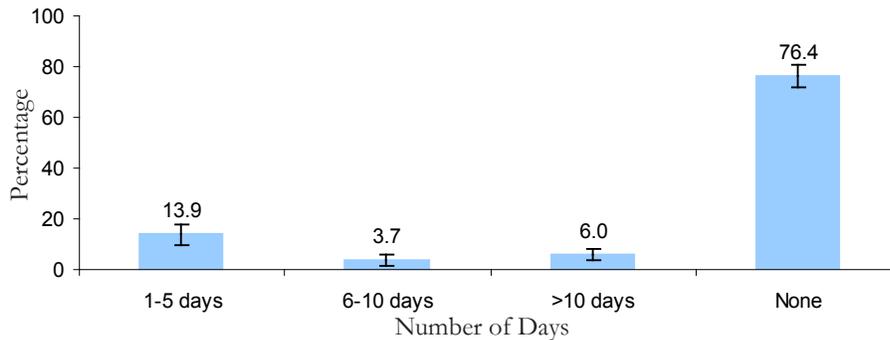
Emergency department, urgent care center, or doctor's office visits for urgent treatment of asthma symptoms are indicators of poorly controlled asthma. More than one in ten individuals with current asthma reported having visited an emergency room or urgent care center for

# Asthma Management and Quality of Life

asthma within the past 12 months, and more than one out of five reported visiting a doctor or other health professional for urgent treatment of worsening symptoms. Reported urgent treatment for asthma within the past 12 months was similar for adults and children.

## Missed Work and School Days

Figure 18. Number of Days Unable to Work or Carry Out Usual Activities During the Past 12 Months, Adults With Current Asthma, Utah, 2006-2007

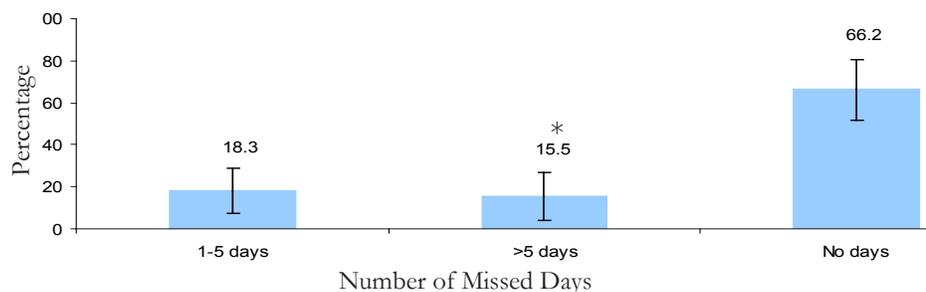


Source: Utah Behavioral Risk Factor Surveillance System. 2006 Adult Asthma History Module and 2007 Call-back Survey combined. Crude prevalence.

Among adults with current asthma, 6.0% reported being unable to work or carry out their usual activities more than 10 days during the past 12 months due to asthma. Most adults (76.4%) responded that they did not experience any days during the past 12 months when asthma prevented them from working or carrying out their usual activities.

# Asthma Management and Quality of Life

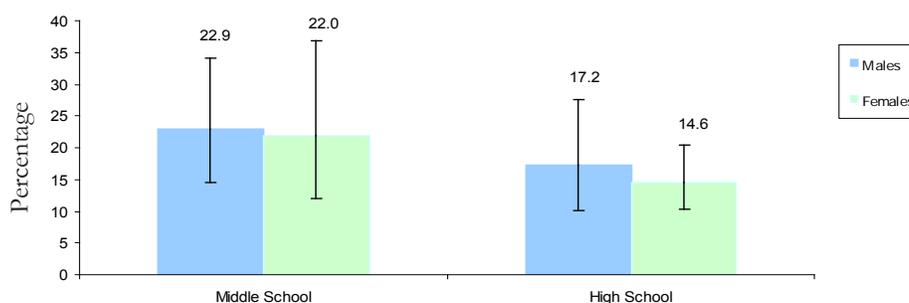
Figure 19. Number of Missed School Days Due to Asthma During Past 12 Months, Utah, School-aged Children With Current Asthma, 2007



Source: Utah Behavioral Risk Factor Surveillance System Call-back Survey, 2007. Crude prevalence.  
 \* The estimate has a coefficient of variation greater than 30% and does not meet Utah Department of Health standards for reliability.

Nationally, asthma is a leading cause of school absenteeism.<sup>3</sup> In Utah it contributes to school absenteeism. Among parents of school-aged children with asthma, 18.3% reported that their child missed 1-5 days of school because of asthma during the past 12 months, and 15.5% said their child missed more than 5 days due to asthma. Two-thirds of parents (66.2%) reported that their child missed no days of school due to asthma.

Figure 20. Students Who Missed at Least 1 Day of School Per Month Due to Asthma, Utah Students With Current Asthma, 2003, 2005, and 2007



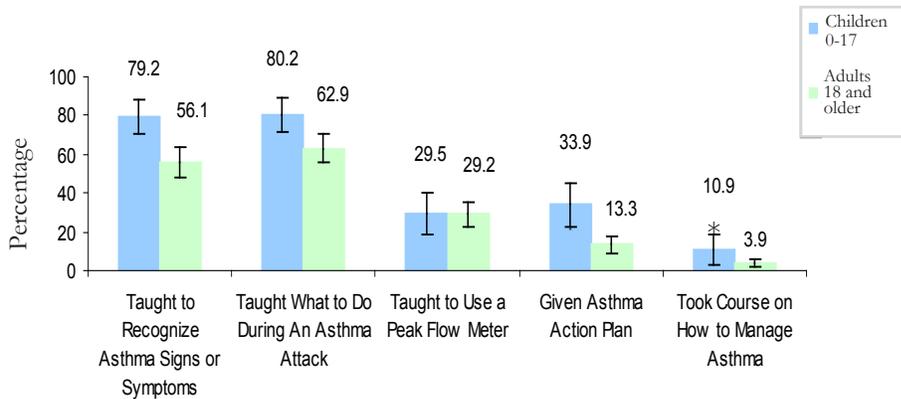
Source: Utah Youth Tobacco Survey, Utah, 2003, 2005, and 2007 combined.  
 Note: Current asthma includes those with doctor-diagnosed asthma who had an asthma attack in the past 12 months.

In a statewide survey administered in middle and high schools, students with asthma were asked to report the frequency of missed school days during the past 12 months due to asthma symptoms. Over one-fifth of middle school children with asthma reported missing at least one day of school each month due to asthma symptoms (22.9% of males, 22.0% of females). The percentage of high school students missing at least one day of school each month due to asthma appeared to be slightly lower. There was no difference in missed school days for asthma between male and female students.

# Asthma Management and Quality of Life

## Asthma Knowledge

Figure 21. Asthma Self-management Knowledge, Adults and Children With Lifetime Asthma, Utah, 2007



Source: Utah Behavioral Risk Factor Surveillance System Call-back Survey, 2007. Crude prevalence.  
 \* The estimate has a coefficient of variation greater than 30% and does not meet UDOH standards for reliability.

Asthma self-management education is an integral part of effective asthma care and improves patient outcomes by reducing limitations on activities and improving quality of life for those with asthma. It is recommended that health care providers teach self-management skills by providing every asthma patient with a written asthma action plan and encouraging self-monitoring and self-management of asthma symptoms.<sup>4</sup>

In 2007, 79.2% of parents of children with lifetime asthma reported that either they or their children were taught by a health professional to recognize early signs or symptoms of an asthma episode and 80.2% reported being taught what to do during an asthma attack. This is significantly higher than the percent of adults with lifetime asthma who reported being taught to recognize signs or symptoms of an asthma episode (56.1%) or what to do during an asthma attack (62.9%).

# Asthma Management and Quality of Life

## Medication Use

Table 1. Asthma Medication Use Among Adults and Children With Current Asthma, Utah, 2007

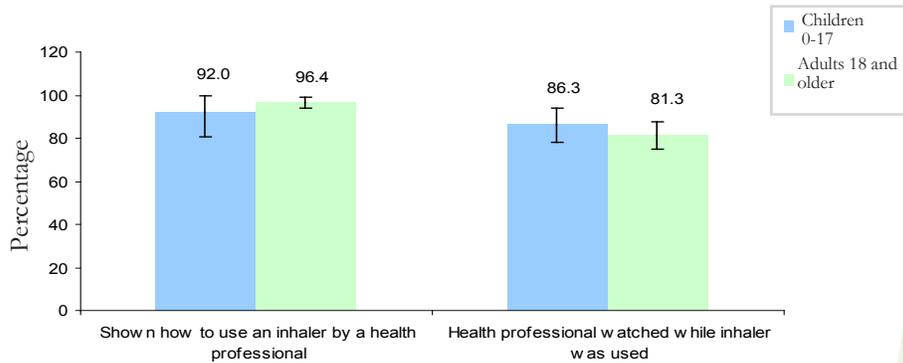
	<b>Adults (18+)</b> Percent (95% CI)	<b>Children (0-17)</b> Percent (95% CI)
Ever used over-the-counter medication for asthma	35.6 (27.1-44.1)	17.0 (7.7-26.4)
Ever used a prescription inhaler	98.0 (96.4-99.6)	87.6 (79.7-95.5)
Took prescription asthma medication using an inhaler during past 3 months	63.0 (54.3-71.7)	49.5 (35.0-64.1)
Took asthma medication in pill form during past 3 months	20.5 (13.1-27.9)	23.3 (11.2-35.5)
Took asthma medication using nebulizer during past 3 months	9.6 (4.6-14.6)	16.8 (6.9-26.6)

Source: Utah Behavioral Risk Factor Surveillance System Asthma Call-back Survey, 2007.

Table 1 gives information on general asthma medication use for adults and children with current asthma. A higher percentage of adults have used over-the-counter medication and a prescription inhaler for asthma when compared to children. Reported asthma medication use during the past 3 months was similar among adults and children.

# Asthma Management and Quality of Life

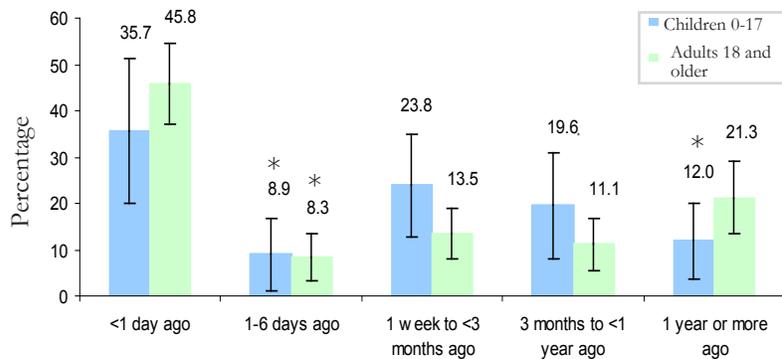
Figure 22. Taught to Use Inhaler by a Health Professional, Adults and Children Who Ever Used an Inhaler, Utah, 2007



Source: Utah Behavioral Risk Factor Surveillance System Call-back Survey, 2007. Crude prevalence.

Of those who have ever used an inhaler, nearly all were taught by a health professional to use the inhaler (92.0% of children and 96.4% of adults). The majority were also watched by a health professional as they used the inhaler (86.3% of children and 81.3% of adults).

Figure 23. Length of Time Since Last Asthma Medication Was Taken, Adults and Children With Current Asthma, Utah, 2007



Source: Utah Behavioral Risk Factor Surveillance System Call-back Survey, 2007. Crude prevalence.

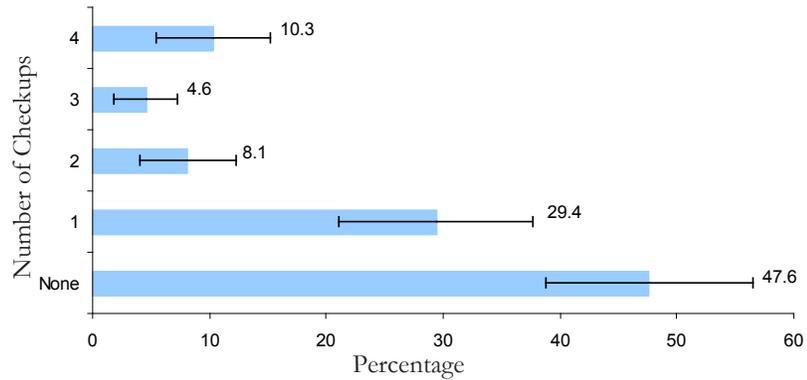
\* The estimate has a coefficient of variation greater than 30% and does not meet UDOH standards of reliability.

Less than one-half of both children (35.7%) and adults (45.8%) with current asthma reported having taken any type of asthma medication within the past day. Nearly one-third of both children (31.6%) and adults (32.4%) had not taken any asthma medication within the past three months. Length of time since last taking asthma medication was similar for adults and children.

# Asthma Management and Quality of Life

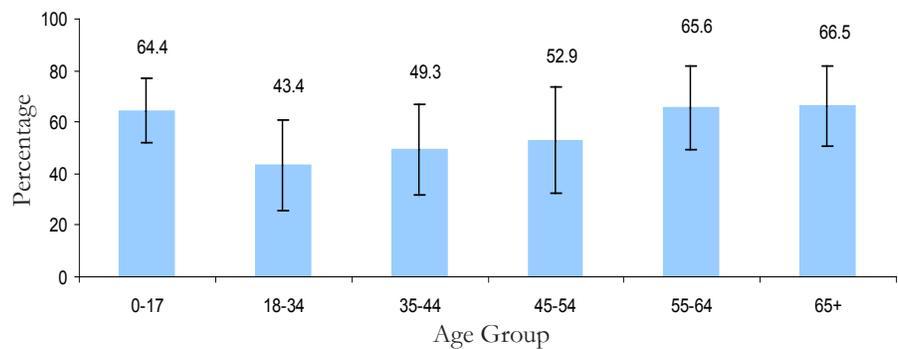
## Routine Care

Figure 24. Number of Routine Asthma Checkups During Past 12 Months, Utah Adults With Current Asthma, 2007



Source: Utah Behavioral Risk Factor Surveillance System Call-back Survey, 2007. Crude prevalence. In 2007, just over half (52.4%) of adults with current asthma reported that they had received at least one routine checkup for their asthma within the past 12 months.

Figure 25. Received Routine Asthma Checkup During Past 12 Months, Utah Residents With Current Asthma, 2007



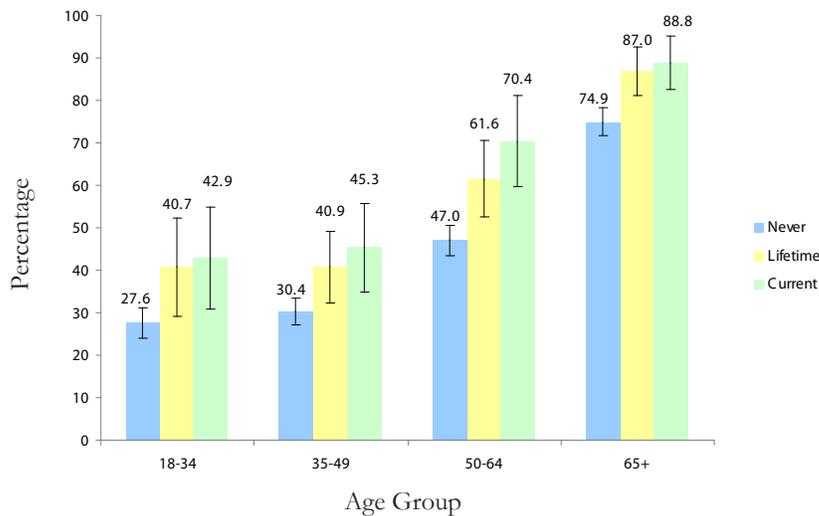
Source: Utah Behavioral Risk Factor Surveillance System Call-back Survey, 2007. Crude prevalence.

Among those with current asthma, it appears that children ages 0-17 and adults ages 55 and older were most likely to get a yearly routine asthma checkup. However, differences between age groups were not statistically different.

# Asthma Management and Quality of Life

## Influenza Vaccination

Figure 26. Percentage Who Received an Influenza Vaccination According to Asthma Status, Utah Adults, 2007



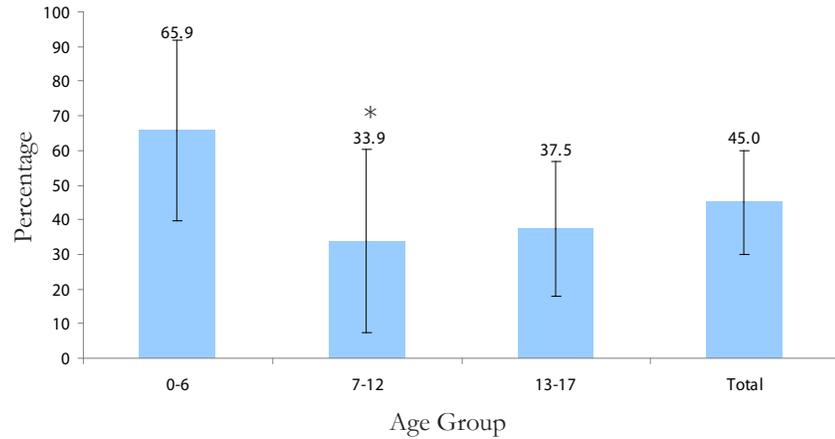
Source: Utah Behavioral Risk Factor Surveillance System, 2007. Crude prevalence.

Note: The percent shown includes those who responded that they received either a flu shot or a flu vaccine that is sprayed in the nose during the past 12 months.

Among all Utah adults, regardless of asthma status, the prevalence of those who received an influenza vaccination within the past 12 months was higher with increasing age, with the highest prevalence among those ages 65 years and older. For every age group except 18-34, a significantly higher percentage of adults with current asthma received a flu vaccination within the past 12 months compared to adults who have never been diagnosed with asthma. The prevalence of those who received a flu vaccination was similar for adults with current and lifetime asthma.

# Asthma Management and Quality of Life

Figure 27. Percentage Who Received an Influenza Vaccination, Utah Children Ages 0-17 With Current Asthma, 2007



Source: Utah Behavioral Risk Factor Surveillance System Call-back Survey, 2007. Crude prevalence.  
\* The estimate has a coefficient of variation >30% and does not meet Utah Department of Health standards for reliability.

Note: The percents shown include those who responded that they had received either a flu shot or a flu vaccine that is sprayed into the nose during the past 12 months.

Nearly half of children with current asthma ages 0-17 (45.0%) received a flu vaccination during the past 12 months. It appeared that a higher percentage of children ages 0-6 (65.9%) received a flu vaccination when compared to older children. Due to small sample sizes, the differences were not statistically significant.

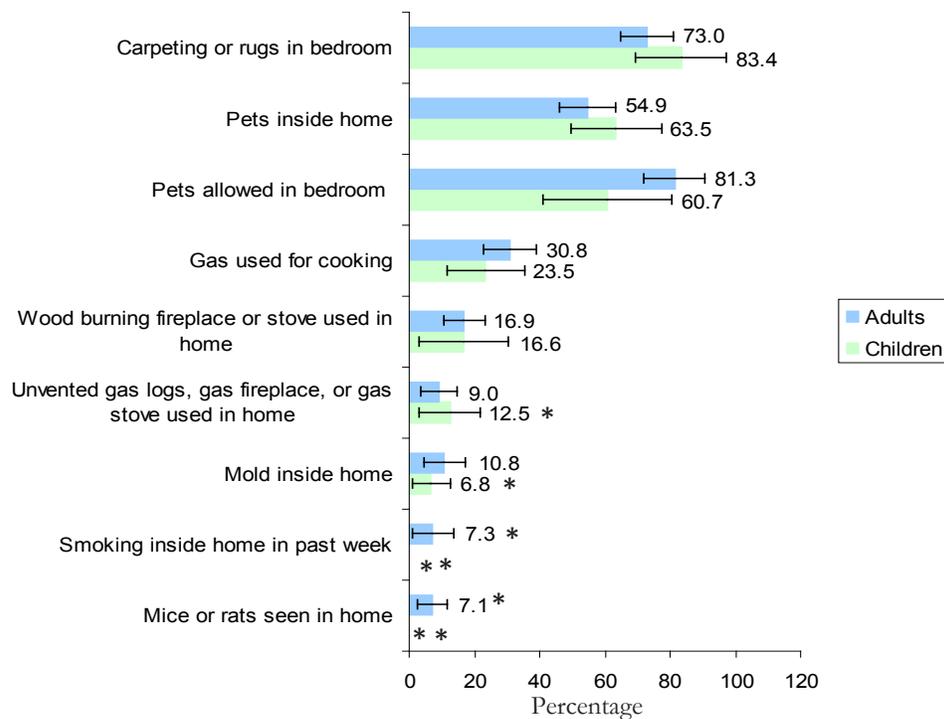
# Indoor Environmental Exposures

Because people generally spend the majority of their time indoors, environmental factors in the home can play a significant role in triggering asthma attacks. Not everyone with asthma is affected the same way by exposure to certain allergens or irritants. However, commonly recognized asthma triggers that can be found indoors include secondhand smoke, dust mites, mold, cockroaches

and other pests, household pets, and combustion byproducts.<sup>5</sup> Environmental modifications can be made in the home to reduce exposure to these triggers and thus reduce worsening of asthma symptoms.

## Indoor Environmental Exposures

Figure 28. Environmental Triggers in the Homes of Adults and Children With Current Asthma, Utah, 2007



Source: Utah Behavioral Risk Factor Surveillance System Call-back Survey, 2007. Crude prevalence.

\* The estimate has a coefficient of variation >30% and does not meet Utah Department of Health standards of reliability.

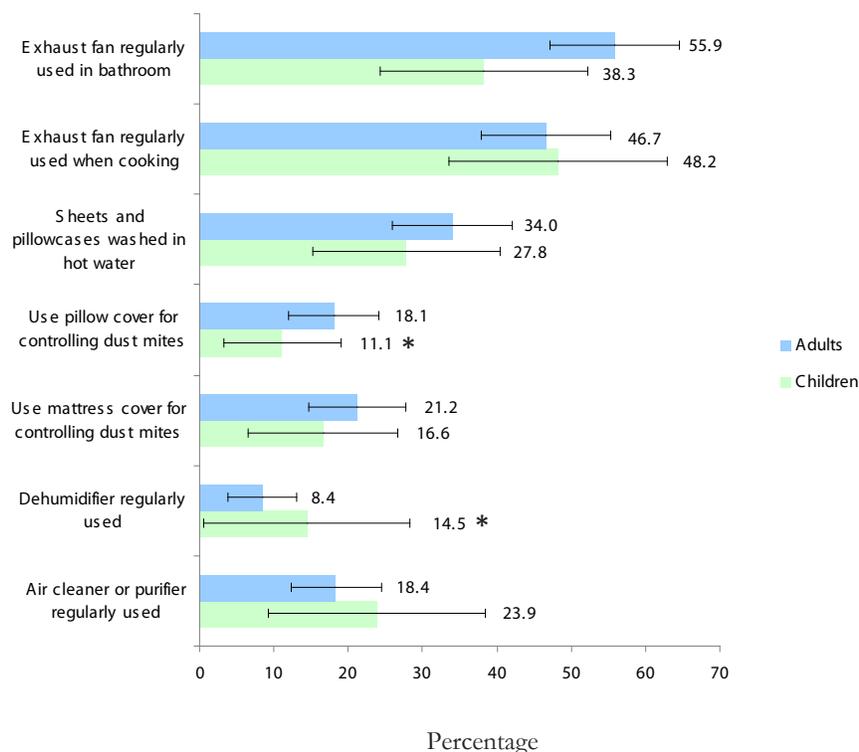
\*\* The estimate has a coefficient of variation >50% and is not considered appropriate for publication.

Note: Categories are not mutually exclusive and do not add up to 100%.

Adults and children with current asthma were asked several questions regarding exposure to potential indoor environmental triggers. The majority of adults and children reported exposure to carpeting/rugs or pets inside the home. Less than 30% of respondents reported exposure to the other indoor triggers. Exposure to indoor asthma triggers was similar for adults and children.

# Indoor Environmental Exposures

Figure 29. Environmental Modifications in the Homes of Adults and Children With Current Asthma, Utah, 2007



Source: Utah Behavioral Risk Factor Surveillance System Call-back Survey, 2007. Crude prevalence.  
 \* The estimate has a coefficient of variation >30% and does not meet Utah Department of Health standards of reliability.  
 Note: Categories are not mutually exclusive and do not add up to 100%.

Approximately half of adults and children with current asthma lived in homes where exhaust fans were regularly used in the bathroom or when cooking. The other environmental modifications were implemented in one-third or fewer homes. Environmental modifications were similar in homes of adults and children with asthma.

More than one in four adults (26.8%) and children (27.9%) with current asthma reported having ever been advised by a health professional to change things in their home, school, or work environment to improve their asthma (data not shown on graph).

## Asthma in Utah Schools

The Centers for Disease Control (CDC) encourages schools to do their part to help children with asthma manage their disease by implementing measures to become more “asthma-friendly.” This means adopting policies and procedures and coordinating student services to better assist students with asthma. When school administrators, teachers, staff, students and parents work together, chances for successful management of children’s asthma is increased. Six specific strategies are recommended by the CDC for addressing asthma within the school system: 1) Establish management and support systems for asthma-friendly schools; 2) Provide appropriate school health and mental health services for students with asthma; 3) Provide asthma education and awareness programs for students and school staff; 4) Provide a safe and

healthy school environment to reduce asthma triggers; 5) Provide safe, enjoyable physical education and activity opportunities for students with asthma; and 6) Coordinate school, family, and community efforts to better manage asthma symptoms and reduce school absences among students with asthma.<sup>6</sup>

## Asthma in Utah Schools

The School Health Profiles (Profiles) survey is administered in Utah schools on a biannual basis and is used to gather information on a variety of school characteristics that affect children’s health, including: school health education; physical education; school health policies related to HIV infection/AIDS; tobacco-use prevention; nutrition; asthma management activities; and family and community involvement in school health programs. Information is gathered from school principals and lead health education teachers in secondary public schools housing grades 6 through 12. Through this survey, School-level Impact Measures (SLIMs) for asthma management are collected and can be used by state and local health agencies to assess the percentage of asthma-friendly schools and monitor the impact of program activities in Utah’s secondary public schools.

# Asthma in Utah Schools

Table 2. Asthma Management School-level Impact Measures, Utah, 2008

School-level Impact Measure (SLIM)	Percentage of Schools Meeting SLIM
The percentage of schools that have ever assessed their asthma policies, activities, and programs by using the School Health Index or similar self-assessment tool.	18
The percentage of schools in which students' family or community members have helped develop or implement asthma management policies and programs.	19
The percentage of schools that have on file an asthma action plan for all students with known asthma.	38
The percentage of schools that implement a policy permitting students to carry and self-administer asthma medications in both of the following ways: <ul style="list-style-type: none"> <li>•Communicate the policy to students, parents, and families</li> <li>•Designate an individual responsible for implementing the policy.</li> </ul>	54
The percentage of schools requiring that all school staff members receive training on recognizing and responding to severe asthma symptoms that require immediate action, as a part of annual staff development.	35
The percentage of schools that have a full-time registered school nurse on-site during school hours.	4
The percentage of schools that have a designated and secure storage location for quick relief asthma medications that is accessible at all times by the school nurse or his/her designee.	92
The percentage of schools that identify students diagnosed with asthma using two or more sources of school health information (e.g., student emergency cards, medication records, health room visit information, emergency care plans, physical exam forms, parent notes).	87

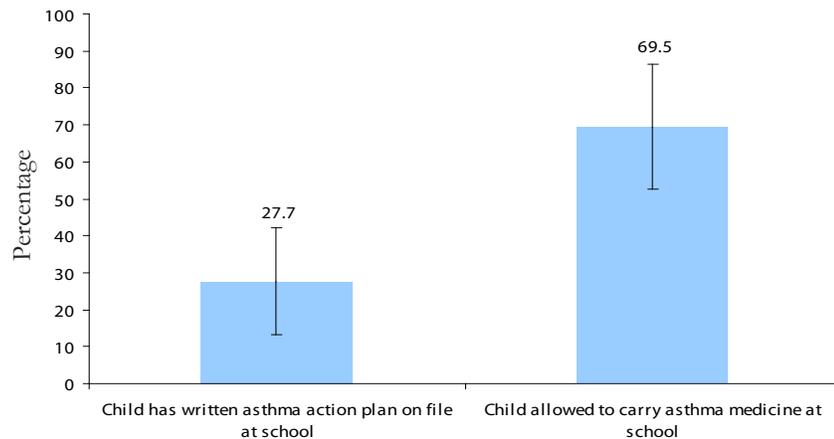
# Asthma in Utah Schools

School-level Impact Measure (SLIM)	Percentage of Schools Meeting SLIM
<p>The percentage of schools that identify students with poorly controlled asthma by keeping track of them in at least three of the following ways:</p> <ul style="list-style-type: none"> <li>•Frequent absences from school.</li> <li>•Frequent visits to the school health office due to asthma.</li> <li>•Frequent asthma symptoms at school.</li> <li>•Frequent non-participation in physical education class due to asthma.</li> <li>•Students sent home early due to asthma.</li> <li>•Calls from school to 911 or other local emergency numbers due to asthma.</li> </ul>	53
<p>The percentage of schools that provide intensive case management for students with poorly controlled asthma at school. These intensive services should include all of the following:</p> <ul style="list-style-type: none"> <li>•Providing referrals to primary health care clinicians or child health insurance programs.</li> <li>•Ensuring an appropriate written asthma action plan is obtained.</li> <li>•Ensuring access to and appropriate use of asthma medications, spacers, and peak flow meters at school.</li> <li>•Offering asthma education for the student with asthma and his/her family.</li> <li>•Minimizing asthma triggers in the school environment.</li> <li>•Addressing social and emotional issues related to asthma.</li> <li>•Providing additional psychosocial counseling or support services as needed.</li> <li>•Ensuring access to safe, enjoyable physical education and activity.</li> <li>•Ensuring access to preventive medications before physical activity.</li> </ul>	10
<p>The percentage of schools that provide parents and families of students with asthma information to increase their knowledge about asthma management.</p>	12

Source: Utah School Health Profiles Survey, 2008.

# Asthma in Utah Schools

Figure 30. Asthma Action Plan and Medicine at School, Utah School-aged Children With Current Asthma, 2007



Source: Utah Behavioral Risk Factor Surveillance System Call-back Survey, 2007. Crude prevalence.

The Utah Asthma Program encourages schools to maintain a written asthma action plan on file for all students with current asthma. In 2007, less than one-third of parents of children with current asthma reported that their children had an asthma action plan on file at their school (27.7%).

Utah Senate Bill 32, which permits students with asthma to possess and self-administer inhaled asthma medications in the school setting, was passed in 2004 to encourage self-management of students' asthma during school hours. As of April of that year, Utah was one of 38 states allowing self-medication among students at school.<sup>7</sup> However, in 2007, only 69.5% of parents of children with asthma reported that their children were allowed to carry their asthma medications at school. A higher percentage of parents of middle school students (88.3%) reported that their children were able to carry their asthma medications when compared to parents of elementary (60.4%) and high school students (65.5%), though differences were not statistically significant (data not shown on graph).

# Health Care Utilization

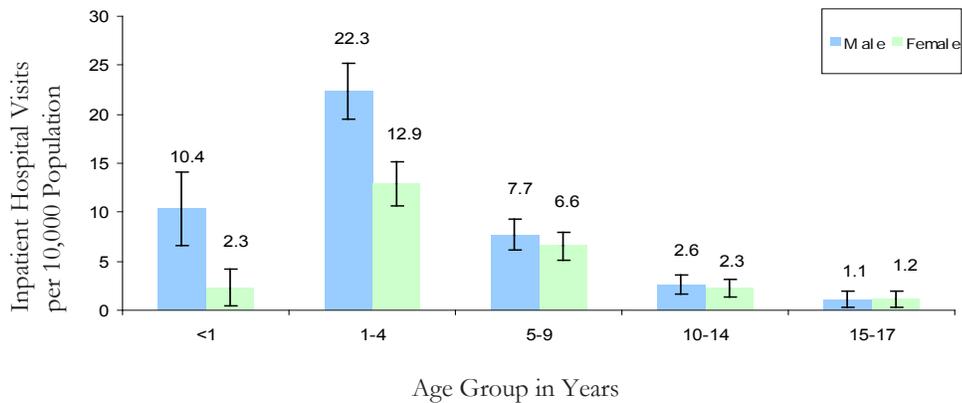
Asthma morbidity can be measured by the numbers of visits asthma sufferers make to the emergency department (ED), as well as in hospitalizations resulting from asthma episodes or attacks. This is where the reality of the true burden of asthma can be seen in individuals whose condition is poorly controlled.

Data are taken from the Utah Inpatient Hospital Discharge Database and the Utah Emergency Department Encounter Database. Because hospitalizations for asthma are often part of ED visits (“treat and admit” to hospital), only “treat and release” encounters were included in the ED data.

## Health Care Utilization

### Hospitalizations

Figure 31. Asthma Hospitalizations by Age and Sex, Utah Children Ages 0-17, 2007



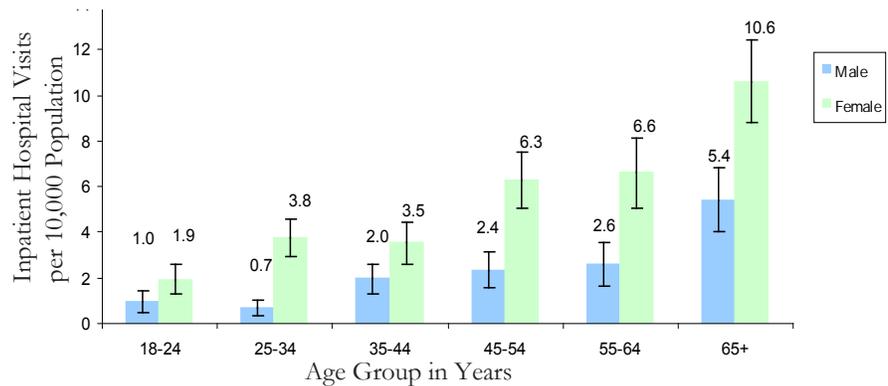
Source: Utah Hospital Discharge Database, 2007. Crude rates.

Note: The primary diagnosis code ICD 493 was used to identify hospitalizations due to asthma.

Children under the age of 5 had the highest rates of hospitalization due to asthma. Males less than 1 year old and 1-4 years of age had a significantly higher rate of hospitalizations (10.4 and 22.3 per 10,000 residents) due to asthma compared to females (2.3 and 12.9 per 10,000 residents). After children reached the age of 5, asthma hospitalizations tended to decrease with increasing age and reached a rate as low as 1.1 per 10,000 residents for males and 1.2 per 10,000 residents for females by ages 15-17.

# Health Care Utilization

**Figure 32. Asthma Hospitalization by Age and Sex, Utah Adults Ages 18 and Over, 2007**

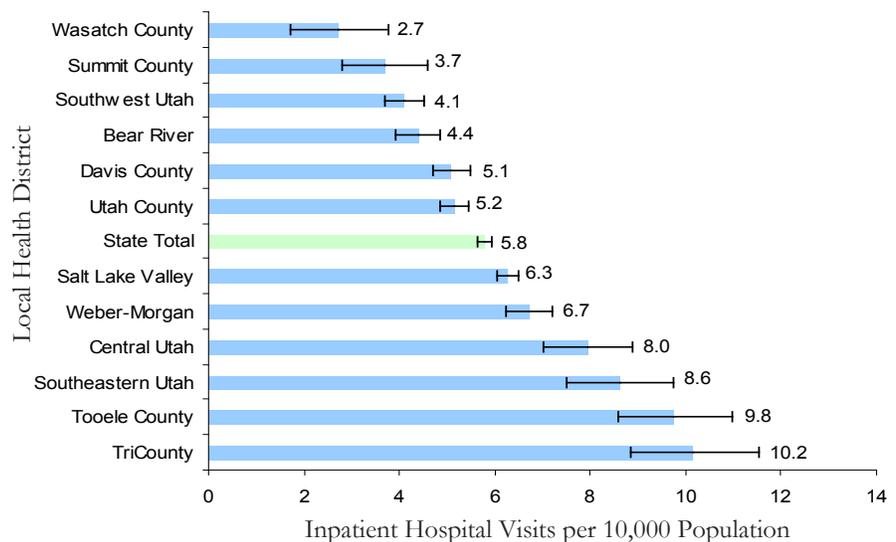


Source: Utah Hospital Discharge Database, 2007. Crude rates.

Note: The primary diagnosis code ICD 493 was used to identify hospitalizations due to asthma.

Female adults had a higher rate of hospitalization due to asthma compared to adult males in every age group. The highest rates of hospitalization for both male and female adults were among those ages 65 years and older (5.4 and 10.6 per 10,000 residents).

**Figure 33. Asthma Hospitalizations by Local Health District, Utah Residents, 2003-2007**



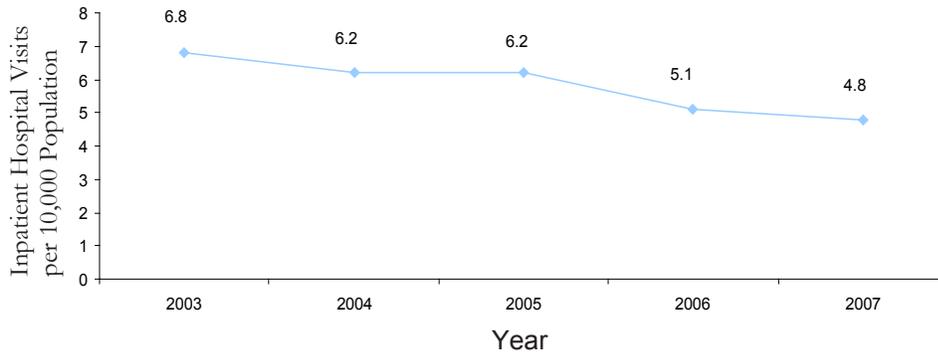
Source: Utah Hospital Discharge Database, 2003-2007 combined. Age-adjusted rates.

Note: The primary diagnosis code ICD 493 was used to identify hospitalizations due to asthma.

For years 2003-2007 combined, the asthma hospitalization discharge rate in Utah was 5.8 per 10,000 residents. Residents of TriCounty Health District had the highest asthma hospitalization rate of 10.2 per 10,000 residents. Wasatch County residents experienced the lowest hospitalization rate due to asthma (2.7 per 10,000 residents).

# Health Care Utilization

Figure 34. Asthma Hospitalizations, Utah Residents, 2003-2007



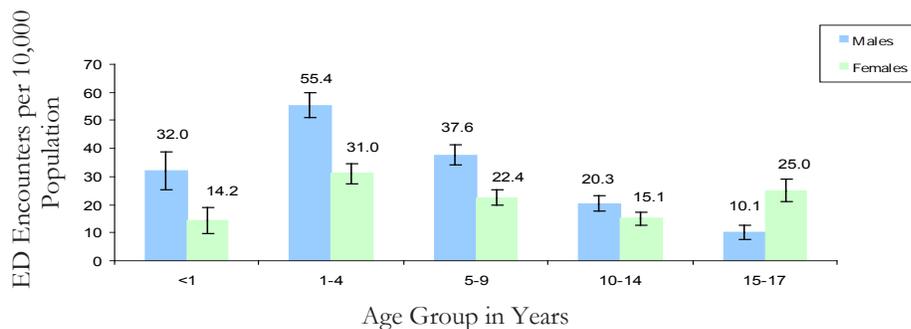
Source: Utah Hospital Discharge Database, 2003-2007. Age-adjusted rates.

Note: The primary diagnosis code ICD 493 was used to identify hospitalizations due to asthma.

Asthma hospitalization discharges in Utah decreased over the past five years, from 6.8 per 10,000 residents in 2003 to 4.8 per 10,000 residents in 2007.

## Emergency Department Visits

Figure 35. Asthma Emergency Department Treat and Release Visits, Utah Children Ages 0-17, 2006



Source: Utah Emergency Department Encounter Database, 2006. Crude rates.

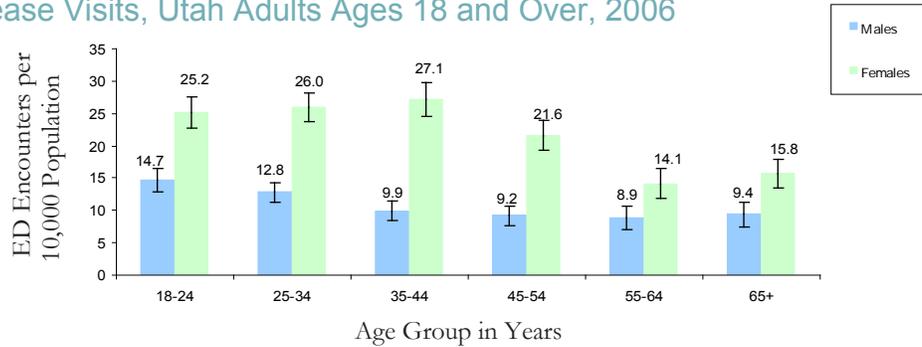
Note: The primary diagnosis code ICD 493 was used to identify emergency department visits due to asthma.

Data include only those who were treated and released but not admitted as inpatients.

The highest rate of emergency department treat and release encounters for children was among males in the age group 1-4 (55.4 encounters per 10,000 residents). For every age group except 15-17, males had a higher rate of emergency department encounters for asthma when compared to females.

# Health Care Utilization

Figure 36. Asthma Emergency Department Treat and Release Visits, Utah Adults Ages 18 and Over, 2006

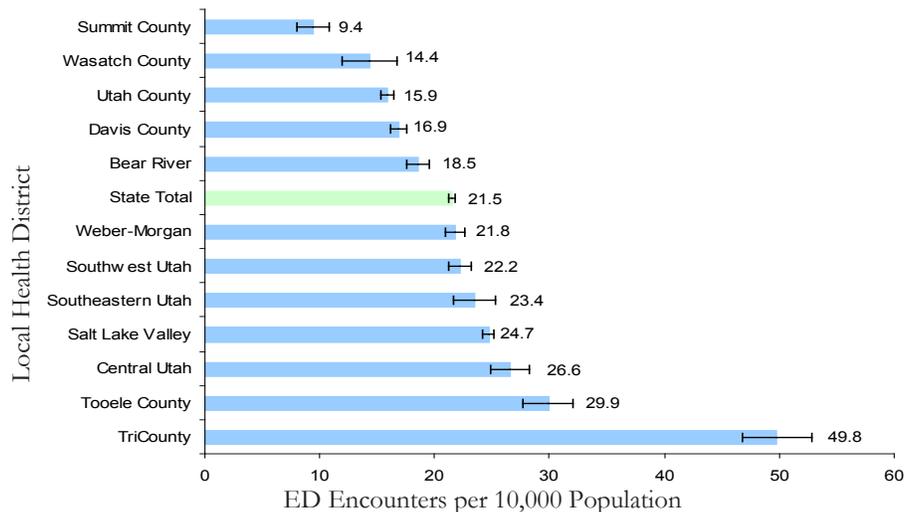


Source: Utah Emergency Department Encounter Database, 2006. Crude rates.

Note: The primary diagnosis code ICD 493 was used to identify emergency department visits due to asthma. Data include only those who were treated and released but not admitted as inpatients.

Among adults ages 18 and older, females experienced a higher rate of emergency department encounters for asthma when compared to males in every age group. The rate of emergency department encounters was the lowest among adults ages 55-64 for both males (8.9 encounters per 10,000 residents) and females (14.1 encounters per 10,000 residents).

Figure 37. Asthma Emergency Department Treat and Release Visits by Local Health District, Utah, 2002-2006



Source: Utah Emergency Department Encounter Database, 2002-2006 combined. Age-adjusted rates.

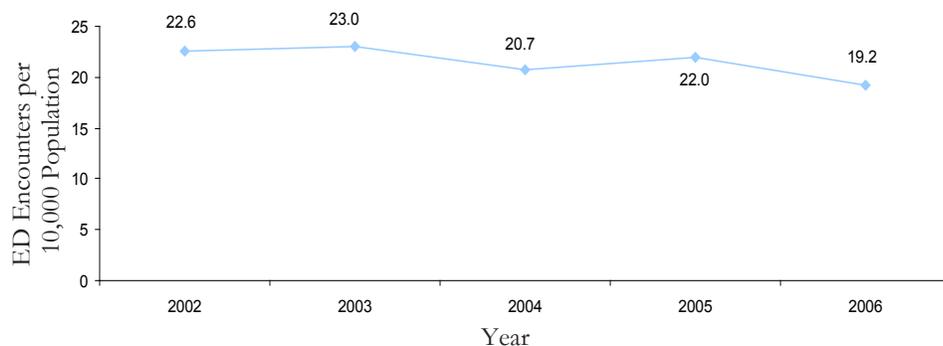
Note: The primary diagnosis code ICD 493 was used to identify emergency department visits due to asthma. Data include only those who were treated and released but not admitted as inpatients.

Rates of emergency department treat and release visits for asthma differed among some local health districts. For years 2002-2006 combined, residents of the TriCounty area experienced the highest rate of emergency department encounters (49.8 encounters per 10,000 residents), which was greater than five times the rate among residents of

## Health Care Utilization

Summit County (9.4 encounters per 10,000 residents). Emergency department encounter rates may be affected by the proximity and availability of health care facilities and do not necessarily reflect differences in asthma severity among residents of local health districts.

**Figure 38. Asthma Emergency Department Treat and Release Visits, Utah, 2002-2006**



Source: Utah Emergency Department Encounter Database, 2002-2006. Age-adjusted rates.  
Note: The primary diagnosis code ICD 493 was used to identify emergency department visits due to asthma. Data include only those who were treated and released but not admitted as inpatients

Utah has experienced some fluctuations in the rate of emergency department treat and release visits for asthma from year to year. However, there has been an overall decrease in rates of emergency department encounters for asthma, decreasing from 22.6 encounters per 10,000 Utah residents in 2002 to 19.2 encounters per 10,000 Utah residents in 2006.

# Health Care Utilization

## Costs of Care

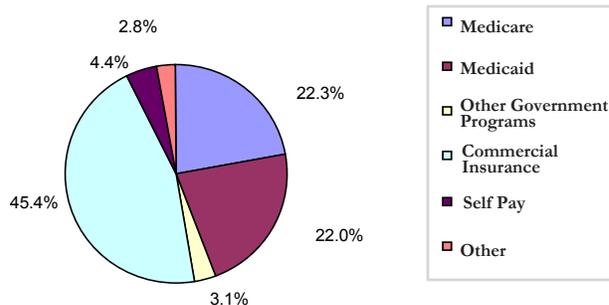
Table 3. Number of Asthma Hospitalizations, Average Length of Stay, Average Charge Per Hospitalization, and Total Hospitalization Charges for Asthma by Sex and Age, Utah Residents, 2007

	Number of Hospitalizations	Average Length of Stay (Days)	Average Charge Per Hospitalization	Total Hospitalization Charges
<b>Sex</b>				
Male	567	2.4	\$7,076	\$4,011,879
Female	716	2.9	\$9,336	\$6,684,499
<b>Age (0-17)</b>				
<1	35	2.5	\$6,639	\$232,372
1-4	368	2.2	\$5,429	\$1,997,801
5-9	170	2.2	\$5,180	\$880,657
10-14	51	2.0	\$4,903	\$250,029
15-17	14	2.5	\$6,144	\$86,013
Total (0-17)	638	2.2	\$5,403	\$3,446,871
<b>Age (18+)</b>				
18-24	49	2.4	\$7,133	\$349,526
25-34	95	2.8	\$10,478	\$995,378
35-44	88	3.0	\$10,766	\$947,407
45-54	133	3.3	\$12,152	\$1,616,202
55-64	97	3.3	\$11,206	\$1,087,028
65+	183	3.6	\$12,317	\$2,253,967
Total (18+)	645	3.2	\$11,240	\$7,249,508
<b>Total Utah Population</b>	<b>1,283</b>	<b>2.7</b>	<b>\$8,337</b>	<b>\$10,696,379</b>

Source: Utah Hospital Discharge Database, 2007.

Notes: The primary diagnosis code ICD 493 was used to identify hospitalizations due to asthma. Some hospitalizations did not have charge data.

Figure 39. Asthma Hospitalization Charges by Primary Source of Payment, Utah, 2007



Source: Utah Hospital Discharge Database, 2007.

Note: The primary diagnosis code ICD 493 was used to identify hospitalizations due to asthma.

In 2007, the percentage of asthma hospitalization charges that were primarily paid for by commercial (45.4%) and government health plans (47.4%) were very similar, with each covering approximately half of the costs. Commercial plans include those such as Blue Cross/Blue Shield and other managed care programs, and government plans include those such as Medicare, Medicaid, and the Children's Health Insurance Program (CHIP). Sources of payment included in the "Other" category include Industrial and Worker's Compensation, charity, and unknown sources.

# Health Care Utilization

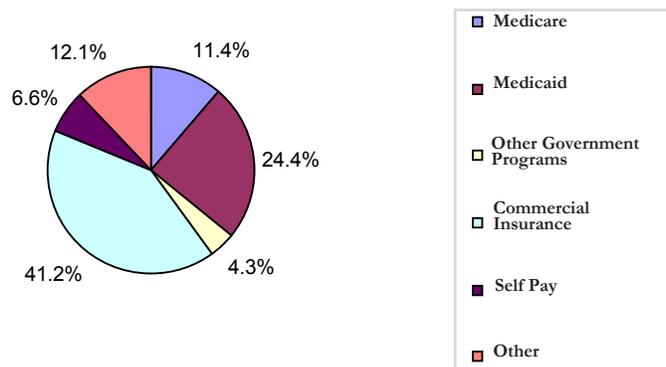
Table 4. Number of Asthma Emergency Department Treat and Release Encounters, Average Charge Per Encounter, and Total Treat and Release Encounter Charges for Asthma by Sex and Age, Utah Residents, 2006

	Number of ED Treat and Release Encounters	Average Charge Per Encounter	Total ED Treat and Release Charges
<b>Sex</b>			
Male	2381	\$709	\$1,687,631
Female	2939	\$804	\$2,363,315
<b>Age (0-17)</b>			
<1	122	\$541	\$66,015
1-4	878	\$536	\$470,622
5-9	690	\$558	\$384,788
10-14	362	\$603	\$218,354
15-17	214	\$593	\$126,896
Total (0-17)	2266	\$559	\$1,266,675
<b>Age (18+)</b>			
18-24	667	\$676	\$450,556
25-34	812	\$855	\$693,923
35-44	588	\$958	\$563,029
45-54	466	\$993	\$462,760
55-64	237	\$1,113	\$263,838
65+	284	\$1,233	\$350,165
Total (18+)	3054	\$912	\$2,784,271
<b>Total Utah Population</b>	<b>5320</b>	<b>\$761</b>	<b>\$4,050,946</b>

Source: Utah Emergency Department Encounter Database, 2006.

Note: The primary diagnosis code ICD 493 was used to identify emergency department visits due to asthma. Data include only costs for those who were treated and released but not admitted as inpatients.

Figure 40. Emergency Department Treat and Release Encounter Charges by Primary Source of Payment, Utah, 2006



Source: Utah Emergency Department Encounter Database, 2006.

Note: The primary diagnosis code ICD 493 was used to identify emergency department visits due to asthma. Data include only costs for those who were treated and released but not admitted as inpatients.

In 2006, the majority of emergency department encounter charges for asthma were paid by government insurance programs such as Medicare, Medicaid and CHIP (40.1% of charges) and by commercial plans such as Blue Cross/Blue Shield and other managed care programs (41.2% of charges). Sources of payment included in the “Other” category include Industrial and Workers Compensation, charity, and unknown sources.



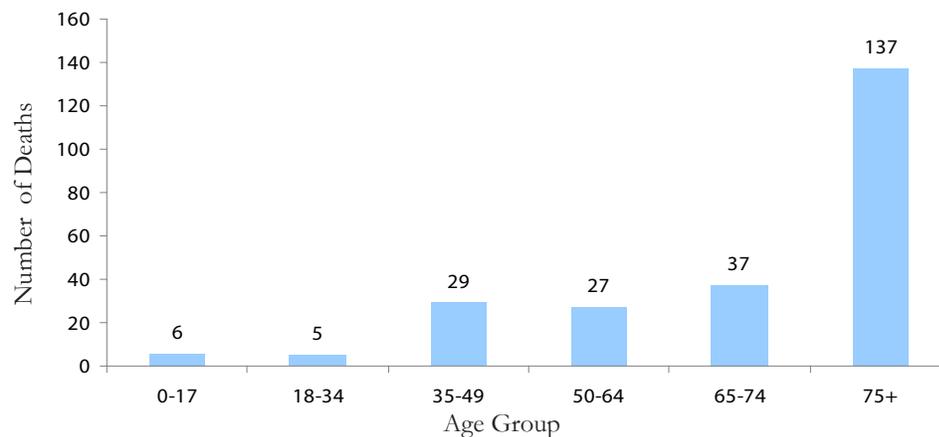
# Asthma Mortality

Asthma-related deaths are rare and most commonly occur among the elderly population. During the seven-year period 2001-2007, asthma was listed as the primary cause of death for 241 individuals; over half of those deaths (56.8%) occurred in individuals ages 75 years and older. The most recently published national

asthma mortality rate of 1.3 per 100,000 population in 2005<sup>8</sup> was similar to Utah's rate for the same year (1.5 per 100,000 population; see Figure 43).

## Asthma Mortality

Figure 41. Number of Asthma Deaths by Age, Utah Residents, 2001-2007



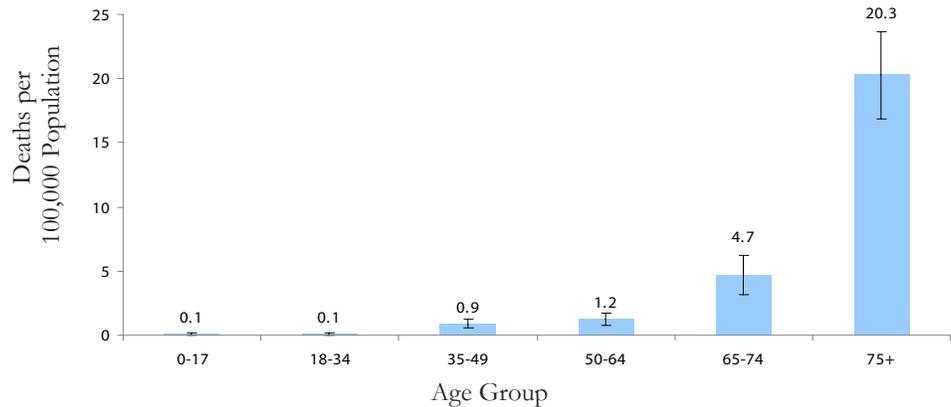
Source: Utah Death Certificate Database, 2001-2007 combined.

Note: ICD-10 codes J45 and J46 were used to identify asthma as the primary cause of death.

During the seven-year period 2001-2007, the highest number of asthma deaths occurred among adults ages 75 years and older. The lowest number of deaths occurred among adults ages 18-34.

# Asthma Mortality

Figure 42. Asthma Mortality Rate by Age, Utah Residents, 2001-2007

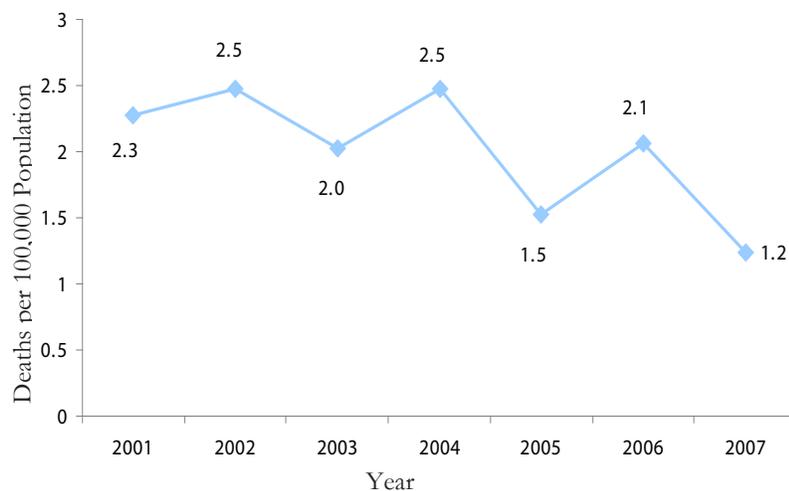


Source: Utah Death Certificate Database, 2001-2007 combined. Crude rates.

Note: ICD-10 codes J45 and J46 were used to identify asthma as the primary cause of death.

During the years 2001-2007, the highest death rate due to asthma occurred among adults ages 75 and older (20.3 per 100,000 Utah residents). The rates were lowest among children ages 0-17 (0.1 per 100,000 Utah residents) and adults ages 18-34 (0.1 per 100,000 Utah Residents).

Figure 43. Asthma Mortality Rate by Year, Utah Residents, 2001-2007



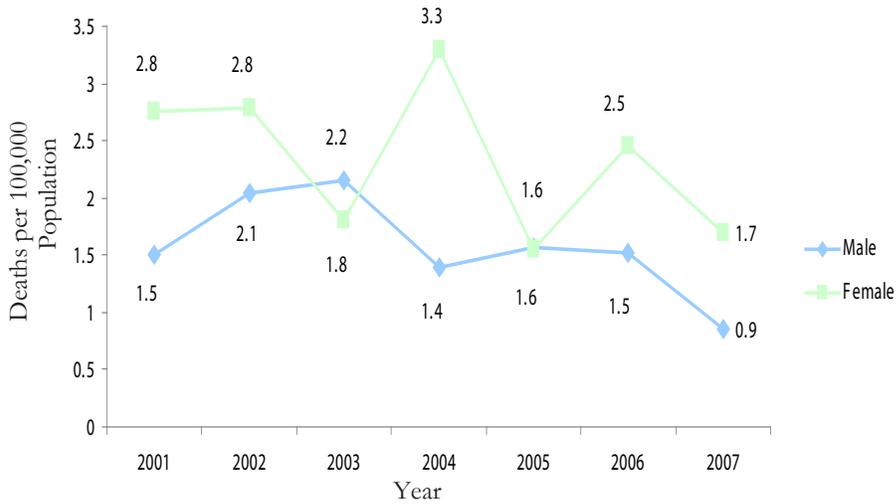
Source: Utah Death Certificate Database, 2001-2007. Age-adjusted rates.

Note: ICD-10 codes J45 and J46 were used to identify asthma as the primary cause of death.

The asthma death rate in Utah was lower in 2007 (1.2 per 100,000 residents) compared to the previous six years. Overall, the asthma death rate dropped by nearly half (47.8%) from 2001 to 2007.

# Asthma Mortality

Figure 44. Asthma Mortality Rate by Year and Sex, Utah Residents, 2001-2007



Source: Utah Death Certificate Database, 2001-2007. Age-adjusted rates.

Note: ICD-10 codes J45 and J46 were used to identify asthma as the primary cause of death.

From 2001 to 2007, females experienced a higher asthma mortality rate compared to males for all years except 2003 and 2005. Overall, both males and females experienced a decrease in asthma death rates between 2001 and 2007 (2.8 to 1.7 for females, 1.5 to 0.9 for males), though the decreasing trend was not constant during all seven years.



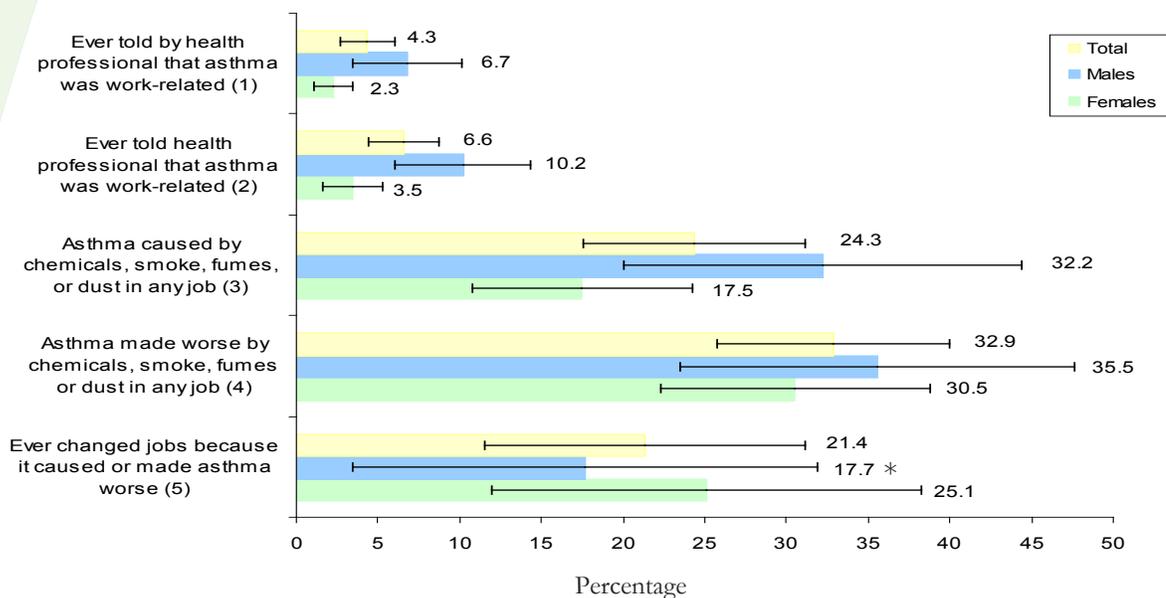
# Occupational Asthma

The United States Department of Labor estimates that 11 million workers across a range of industries and occupations are exposed to one or more agents known to be associated with occupational asthma.<sup>9</sup> Some occupational groups at high risk for the development of work-related asthma include chemical workers, construction workers, bakers, cleaners, textile workers, animal handlers, and health care workers.<sup>10</sup>

Asthma in the workplace is one of the priority areas for the Utah Asthma Program and Task Force as outlined in the Utah Asthma Plan. The outlined objective is “to promote awareness of asthma risk associated with social, economic, ethnic, occupational, and other related factors to reduce asthma morbidity and improve quality of life.” Tracking occupational asthma is accomplished through the Behavioral Risk Factor Surveillance System.

## Occupational Asthma

Figure 45. Prevalence of Work-related Asthma Among Adults With Lifetime Asthma, Utah, 2007



Source: 2006 BRFSS Adult Asthma History Module and 2007 BRFSS Call-back Survey combined (1-2); 2007 BRFSS Call-back Survey (3-5). Crude prevalence.

\* The estimate has a coefficient of variation >30% and does not meet Utah Department of Health standards for reliability.

# Occupational Asthma

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The prevalence of work-related asthma in Utah was assessed by asking the adult working population who had ever been diagnosed with asthma if their asthma was caused or worsened by their current or previous job.

Overall, 4.3% of respondents with lifetime asthma said that a health professional has told them their asthma was work-related, and 6.6% said they have told a health professional that their asthma was work-related. A higher percentage of males had told a health professional that their asthma was work-related (10.2%) when compared to females (3.5%). However, a much higher percentage of individuals with lifetime asthma believed that their asthma was caused (24.3%) or made worse (32.9%) by their jobs, with no significant difference by sex. Approximately one-fifth of individuals who have ever been diagnosed with asthma reported having left a job because it caused or worsened their asthma symptoms (21.4%).

# Asthma in the Medicaid Population

The Utah Medicaid program provides health insurance for low income individuals who cannot afford the cost of health care and who have resources or assets under the federal limit for the category of Medicaid. An individual must qualify each month for continued coverage, and enrollment levels vary from month to month within the program.<sup>11</sup>

Data for the Medicaid population have become increasingly important in light of recent efforts to extend asthma interventions to the most

vulnerable groups. To more fully understand the burden of asthma among low income populations, 2008 Medicaid data were analyzed for recipients 0-64 years of age who were enrolled in either a fee-for-service or managed care program. Analysis provided key information regarding health care utilization rates for this group, which can be used to help guide future interventions. Results are specific to the Medicaid population and are not generalizable to the Utah population as a whole.

## Asthma in the Medicaid Population

### Health Care Utilization for Asthma

For calculations of health care utilization rates, only recipients who were continuously enrolled in a Medicaid program for at least 11 months during 2008 were included (see Appendix B for full methodology). During that year, 151,741 recipients were continuously enrolled, with a nearly equal enrollment of males and females (46.3% males, 53.7% females). The majority of Medicaid recipients (67.0%) were ages 17 or younger (see Table 5).

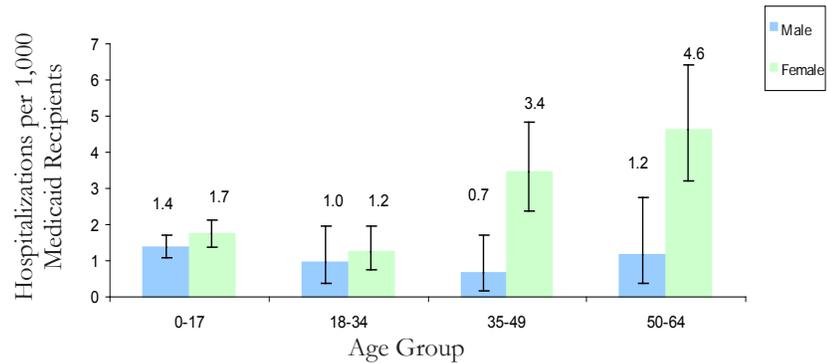
Table 5. Utah Medicaid Recipients Continuously Enrolled in 2008

	Female Number (% of Total)	Male Number (% of Total)	Unknown Number (% of Total)	Total Number (% of Total)
<b>0-17</b>	49,043 32.3%	52,587 34.7%	13 <1.0%	101,643 67.0%
<b>18-34</b>	15,304 10.1%	7,375 4.9%	0 0.0%	22,679 14.9%
<b>35-49</b>	9,592 6.3%	5,982 3.94%	0 0.0%	15,574 10.3%
<b>50-64</b>	7,579 5.0%	4,266 2.8%	0 0.0%	11,845 7.8%
<b>Total</b>	81,518 53.7%	70,210 46.3%	13 <1.0%	151,741 100.0%

Source: Utah Medicaid Data Warehouse, 2008.

# Asthma in the Medicaid Population

Figure 46. Inpatient Hospitalization Rates for Asthma Among the Utah Medicaid Population by Age and Sex, 2008

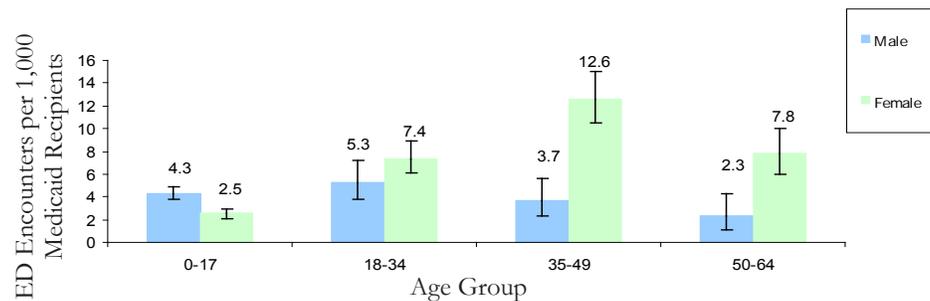


Source: Utah Medicaid Data Warehouse, 2008. Crude rates.

Note: Only Medicaid recipients who were continuously enrolled for 11-12 months during 2008 were included in calculations of the rates.

Among continuously enrolled Medicaid recipients, the highest rate of inpatient hospitalizations for asthma was among females ages 50-64 (4.6 encounters per 1,000 Medicaid recipients). Females experienced a higher rate of hospitalizations for asthma than males for age groups 35-49 and 50-64.

Figure 47. Emergency Department Encounter Rates for Asthma Among the Utah Medicaid Population by Age and Sex, 2008



Source: Utah Medicaid Data Warehouse, 2008. Crude rates.

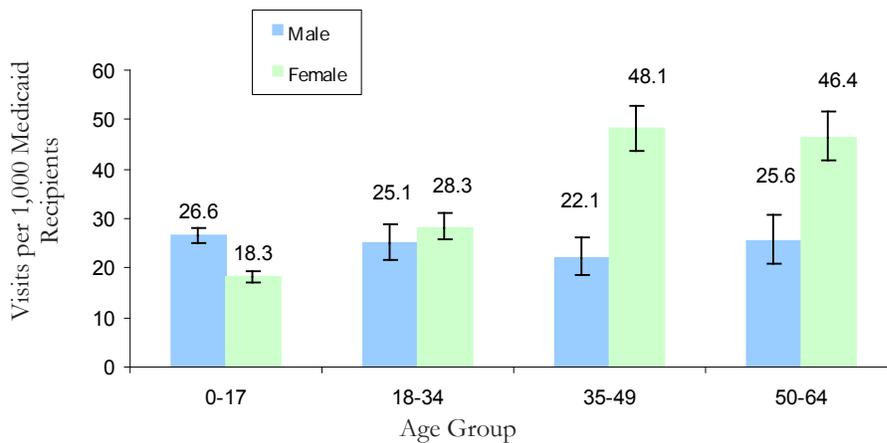
Note: Only Medicaid recipients who were continuously enrolled for 11-12 months during 2008 were included in calculation of the rates.

Females ages 35-49 experienced the highest rate of emergency department encounters for asthma among the Medicaid population (12.6 encounters per 1,000 Medicaid recipients). Males ages 0-17 experienced a higher rate of

# Asthma in the Medicaid Population

emergency department encounters (4.3 encounters per 1,000 Medicaid recipients) when compared to females (2.5 encounters per 1,000 Medicaid recipients); however, females experienced a higher rate of emergency department encounters than males for all other age groups (for age group 18-34, the difference was not statistically significant).

Figure 48. Outpatient Visit Rates for Asthma Among the Utah Medicaid Population by Age and Sex, 2008



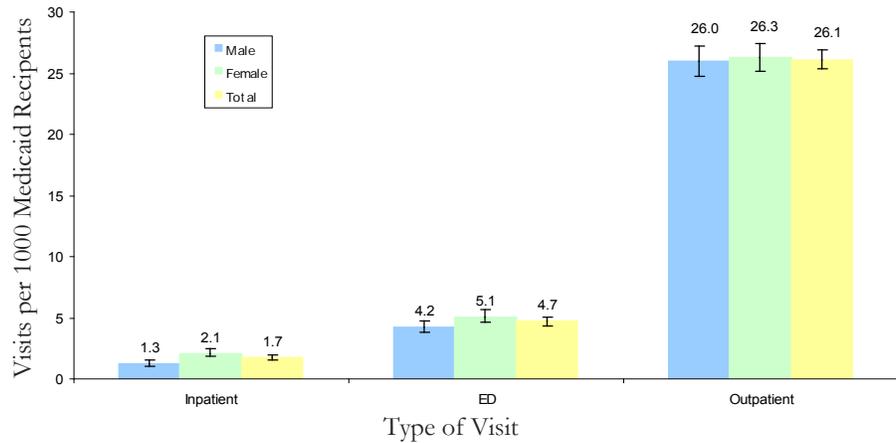
Source: Utah Medicaid Data Warehouse, 2008. Crude rates.

Note: Only Medicaid recipients who were continuously enrolled for 11-12 months during 2008 were included in rate calculations.

An outpatient visit is one where the patient is not required to stay overnight in a hospital and may occur in a setting such as a doctor's office, clinic, or hospital outpatient center. Females ages 35-49 and 50-64 experienced the highest rates of outpatient visits for asthma (48.1 and 46.4 visits per 1,000 Medicaid recipients). Their rates were significantly higher than the rate for males in the same age groups (22.1 and 25.6 visits per 1,000 Medicaid recipients). Only males ages 0-17 had a higher rate of outpatient visits for asthma (26.6 visits per 1,000 Medicaid recipients) compared to females.

# Asthma in the Medicaid Population

Figure 49. Inpatient Hospitalization, Emergency Department, and Outpatient Visit Rates for Asthma by Sex, Utah, 2008



Source: Utah Medicaid Data Warehouse, 2008. Crude rates.

Note: Only Medicaid recipients who were continuously enrolled for 11-12 months during 2008 were included in calculation of the rates.

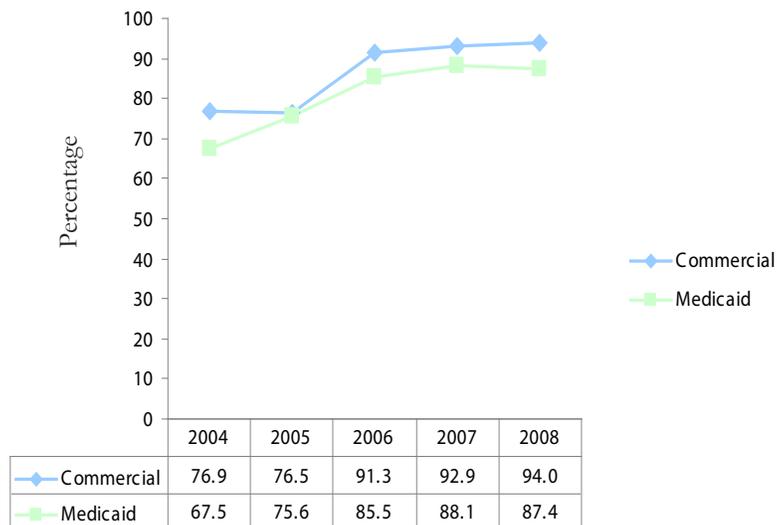
In 2008, the highest rate of health care utilization for asthma occurred in the outpatient setting. The overall rates of inpatient hospitalizations, emergency department encounters, and outpatient visits were all statistically different, with the inpatient hospitalization rate for asthma being the lowest (1.7 per 1,000 Medicaid recipients) and the outpatient visit rate being the highest (26.1 per 1,000 Medicaid recipients) among the general Medicaid population. This trend was observed for both males and females.

# Asthma in the Medicaid Population

## Healthcare Effectiveness Data and Information Set (HEDIS)

For calculations of HEDIS measures, only recipients in a managed care plan who were continuously enrolled in the year of analysis and the prior year were included. Persistent asthma was determined according to 2008 NCQA guidelines for HEDIS measures.<sup>12</sup>

Figure 50. HEDIS Measure: Use of Appropriate Medications for People With Persistent Asthma, Ages 5-56 Years, Utah, 2004-2008

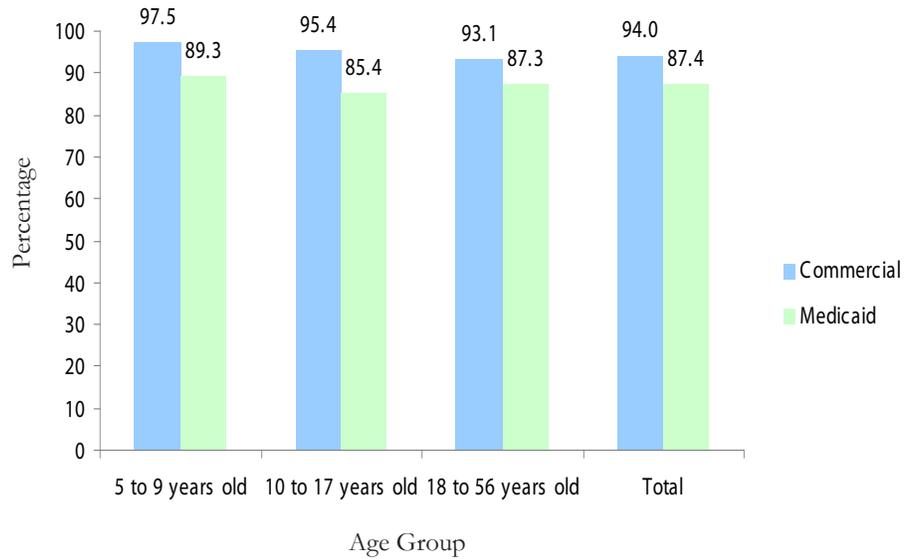


Source: The Healthcare Effectiveness Data and Information Set (HEDIS) 2004-2008.

HEDIS is used to measure the performance of health plans relating to important aspects of care and service. For asthma, the use of appropriate medications among individuals with persistent asthma can be assessed through the analysis of health care-related claims. Over the past five years, appropriate medication use by those with persistent asthma has increased for those on both commercial and Medicaid health plans, with adherence among commercial plans remaining slightly higher than Medicaid. Among Medicaid recipients, adherence to appropriate medication use has increased nearly 30%, from 67.5% in 2004 to 87.4% in 2008.

# Medicaid

Figure 51. HEDIS Measure: Use of Appropriate Medications for People With Persistent Asthma by Age Group, Utah, 2008



Source: The Healthcare Effectiveness Data and Information Set (HEDIS) 2008.

In 2008, commercial insurance plans showed a higher percentage of adherence to proper medication use (94.0%) among individuals with persistent asthma when compared to Medicaid plans. Adherence to proper medication use was the highest among the 5-9 age group for both commercial (97.5%) and Medicaid (89.3%) plans.

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11. Utah Department of Health. Utah Medicaid Program. Available at [http://health.utah.gov/medicaid/provhtml/what\\_is\\_medicaid\\_.html](http://health.utah.gov/medicaid/provhtml/what_is_medicaid_.html) [Last accessed February 26, 2009]
12. National Committee for Quality Assurance. HEDIS 2008 Volume 2: Technical Specifications. Washington, DC: National Committee for Quality Assurance, 2008

## Appendix A: Data Sources

**Behavioral Risk Factor Surveillance System (BRFSS).** The BRFSS is a state-based system of health surveys that was established by the Centers for Disease Control and Prevention (CDC) to assess the prevalence of and trends in health-related behaviors in the non-institutionalized adult population aged 18 years and older. Data are collected monthly from a random telephone sample of adults living in households with land line telephones. Currently, data are collected monthly in all 50 states, the District of Columbia, Puerto Rico, the U.S. Virgin Islands, and Guam. More than 350,000 adults are interviewed each year, making the BRFSS the largest telephone health survey in the world. Utah has participated continuously in the BRFSS since its inception in 1984.

The BRFSS questionnaire is modified each year by the CDC in collaboration with participating state agencies. The questionnaire has three parts. The first part is a core set of questions that is asked by all states. The second part consists of a series of topical modules developed by the CDC. States have the option of adding modules as they wish. Utah has used several of the CDC modules relating to asthma, including the Adult Asthma History and Occupational Asthma Modules. The final part of the questionnaire consists of questions designed and administered by individual states to address issues of local concern. These have been revised annually in Utah to maximize the survey's ability to address the needs of Utah's health programs. Participants in the Utah BRFSS are asked about a wide variety of behaviors such as seat belt use, exercise, tobacco and alcohol consumption, health services utilization, and basic demographic information. Participation in the BRFSS is completely anonymous and voluntary. Prior to analysis, BRFSS data are weighted so that the findings can be generalized to the Utah adult population.

**Utah Emergency Department Encounter Database (EDED) and Utah Inpatient Hospital Discharge Database (HDDDB).** The EDED contains consolidated information on complete billing, medical codes, characteristics describing a patient, services received, and charges billed for each patient emergency department (ED) encounter. The Bureau of Emergency Medical Services/Office of Health Care Statistics receives quarterly emergency department encounter data from hospitals. The data are converted into a standardized format and validated through a process of automated editing and report verification. Each record is subjected to a series of edit checks for accuracy, consistency, completeness, and conformity with

## Appendix A: Data Sources

the definitions specified in the Utah Hospital Emergency Patient Encounter Data Submittal Manual. Records failing the edit check are returned to the data supplier for correction.

The HDDDB contains consolidated information for complete billing, medical codes, characteristics describing a patient, services received, and charges billed for each inpatient hospital stay. The Office of Health Care Statistics (OHCS) receives quarterly discharge data from hospitals. The data are converted into a standardized format and validated using automated editing and report verification. Each record is subjected to a series of edits to check for accuracy, consistency, completeness, and conformity with the definitions specified in the Data Submittal Manual. Records failing the edit check are returned to the data supplier for correction.

Since the data source is billing forms, all visits or encounters have a diagnosis code. There is some difference of opinion regarding whether some providers emphasize diagnosis codes that yield higher reimbursements. The hospital and ED data are considered “Administrative Data” because they were created for use in billing and remittance of payment. As such, they were not constructed for public health surveillance purposes, and are weak in areas such as external causes of injury and race or ethnicity. In general, however, they are extremely valuable and reasonably complete and valid.

### **Utah Youth Tobacco Survey (YTS)**

The YTS is a state-based survey that collects uniform, state-specific data prevalence rates of many different tobacco products, knowledge and attitudes regarding tobacco use, the impact of media and advertising, minors’ access to tobacco products, knowledge of tobacco in school curricula, cessation attempts and successes, and exposure to environmental tobacco smoke. The survey also includes questions about asthma diagnosis, treatment, and activity limitations due to asthma.

The survey instrument was developed in 1998-1999 through a collaborative process by participating states and the CDC Office on Smoking and Health. The survey was conducted in Utah in 2003, 2005, and 2007. The survey is conducted in both middle and high schools. School and student participation in the survey project is completely voluntary and student responses to the questionnaire are completely confidential. Active consent is obtained from parents of participating students. Students who do not have parental consent do not participate in the survey.

# Appendix A: Data Sources

## **Utah Death Certificate Database**

Utah requires that death certificates be filed by funeral directors. Funeral directors obtain demographic information from an informant, usually a close family member of the deceased. The cause of death is certified by the decedent's physician or the physician who attended the death. Accidental and suspicious deaths are certified by the Medical Examiner. Death Certificate data are assessed for completeness and consistency. The Office of Vital Records and Statistics (OVRs) conducts annual training for funeral directors and local registrars. When death certificates are received, the cause of death literals are computer-entered by personnel at the OVRs. The data are then shipped to the National Center for Health Statistics (NCHS), where they are machine-coded into ICD-10 codes. NCHS returns the ICD-10 codes to OVRs and the records are updated.

## **Utah Medicaid Data Warehouse**

The Utah Medicaid Data Warehouse is housed within the Utah Department of Health's Division of Health Care Financing and contains records for all Medicaid recipients across the state. Within the data warehouse, records that are maintained include member personal identification and eligibility information, medical and pharmacy claims, reimbursement amounts, provider type, and all other information that is associated with health-related claims. Records are maintained within tables that can be linked to determine health care utilization for individual members or sub-populations within the Medicaid population. Data are processed and updated on a daily basis and reflect continuous fluctuations that occur among member eligibility and health care utilization.

## **Utah School Health Profiles**

The School Health Profiles (Profiles) assist states and local education and health agencies in monitoring and assessing characteristics of: school health education; physical education; school health policies related to HIV infection/AIDS, tobacco-use prevention; nutrition; asthma management activities; and family and community involvement in school health programs. Data from Profiles can be used to improve school health programs.

## Appendix A: Data Sources

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Two questionnaires are used to collect data—one for school principals and one for lead health education teachers. The two questionnaires were mailed to 250 secondary public schools containing any of grades 6 through 12 in Utah during the spring of 2008. Usable questionnaires were received from 73% of principals and 75% of teachers. Because the response rates for these surveys were  $\geq 70\%$ , the results are weighted and are representative of all regular public secondary schools in Utah having at least one of grades 6 through 12.

The Profiles questionnaires were developed by the Division of Adolescent and School Health, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention in collaboration with representatives of state, local, and territorial departments of health and education.

# Appendix B: Technical Notes and Methodology

## Report Terminology

### Prevalence

The prevalence can be interpreted as the percentage of the population with the given health condition of interest. The numerator includes the count of those with the condition and the denominator includes a count of the total population of interest, resulting in a proportion.

#### A. Crude Prevalence

In general, prevalence is called "crude prevalence" if it has not been adjusted for the age and sex composition of a population.

#### B. Age- and Sex-specific Prevalence

An age- or sex-specific prevalence estimate is calculated by dividing the total number of individuals with a health condition for the specific age group of interest by the total population in that age or sex group.

### Rates

The count alone will be less useful when comparing populations of unequal size. Knowing population sizes is useful, but computing a rate will allow direct comparison between similar populations. A rate is a fraction that typically has four components:

1. A specified time period.
2. The numerator, which is the number of people for whom an event occurred during a given period of time.
3. The denominator, which is the total number of people in the population at risk for the same period of time. This is also referred to as the "person-years at risk."
4. A constant. The result of the fraction is usually multiplied by some constant (such as 100,000) to make the number more legible.

#### A. Crude Rates

In general, a rate is called a "crude rate" if it has not been adjusted for the age and sex composition of a population.

#### B. Age- and Sex-specific Rates

An age- or sex-specific rate is calculated by dividing the total number of health events for the specific age or sex group of interest by the total population in that age group.

## Appendix B: Technical Notes and Methodology

### Age-adjustment

Crude rates (or crude prevalence estimates) are valuable for comparing similar populations of different sizes, but the word "similar" is a key concept, because crude rates can be misleading when comparing rates for populations with different age compositions. The crude mortality rate for a population depends on the mortality rate in each age group as well as the proportion of people in each age group. For instance, the crude rate for most causes of death will be higher in populations with a large proportion of elderly individuals and lower in populations with a large proportion of young individuals. An age-adjusted rate may be used to compare mortality or disease risk in two populations with different age compositions.

An adjusted rate is an overall summary measure that helps control for age differences between populations. When comparing across geographic areas, some method of age-adjusting is typically used to control for area-to-area differences in health events that can be explained by different age distributions in the area populations. For example, an area with an older population will have higher crude death rates for cancer, even though its exposure levels and cancer rates within specific age groups may be the same as those in other areas. One might incorrectly attribute the high cancer rates to some characteristic of the area other than age. Age-adjusted rates control for age effects, allowing better comparability of rates across areas. Age-adjustment may also be used to control for age effects when comparing across several years of data, as the age distribution of the population changes over time.

Calculating age-adjusted rates using "direct age standardization" is the same as calculating a weighted average. It adjusts the age-specific rates observed in a given population (such as a county or ethnic group) to the age distribution of a standard population (Lilienfeld & Stolley, 1994).

## Appendix B: Technical Notes and Methodology

### **Confidence Interval**

Observed health statistics (counts, rates, percentages, etc.) from sample data are not always a true reflection of the health status in the general population. Health data gathered can vary from sample to sample or from year to year, and for this reason confidence intervals are used to estimate the true underlying risk of a health problem within a community. A 95% confidence interval is the range within we can be 95% confident that the estimate reflects the true health status we are trying to convey for a given population. Confidence intervals are included within many of the graphs and tables throughout this report and should be interpreted accordingly.

### **Statistical Significance**

Because health data can vary from year to year or from sample to sample, 95% confidence intervals are used to estimate the true underlying risk of a health problem within a community (see above). At times the prevalence or rate estimates for two different groups can appear to be different from one another based on the point estimates alone when in reality, the difference may be due to sampling variation rather than true differences in the underlying populations. Prevalence estimates or rates are considered to be statistically different from one another if their confidence intervals do not overlap, which suggests true differences in the underlying populations.

# Appendix B: Technical Notes and Methodology

## Medicaid Data Analysis

For calculation of Medicaid hospitalization, emergency department and outpatient visit rates, the following criteria were used to determine the denominator population:

- 0-64 years (age as of December 31, 2008 was used)
- Continuously enrolled in 2008, with no more than 1 month gap in enrollment (11 or more months of enrollment)
- Fee-for-service and managed care programs were included

The above criteria, in addition to the following, were used to determine the numerator when calculating rates:

- Primary Diagnosis Code 493 and CPT and Revenue codes from 2008 HEDIS guidelines<sup>12</sup> used to identify visits as hospitalization, ED, or outpatient visits for asthma.
- Used ending service date of claim, not date when claim was paid.
- Used “fully adjusted” claims to avoid counting the same claim more than once.
- Used ID number and ending date of service to combine fully adjusted claims without duplication.
- All encounters were included in the numerator, and there may be multiple claims per recipient. Same claim types on the same dates of service for the same individual were included as one claim so as not to duplicate claims.



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