

Asthma in Utah

Burden Report 2012



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Executive Summary

The Asthma in Utah Burden Report 2012 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 impact of asthma 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 vision of the Utah Asthma Task Force—Utah communities working together to improve the quality of life for people with asthma—will be realized.

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 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 lessen 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 that year and created the Utah Asthma Program and Asthma Task Force. Continued funding was received through renewals of the cooperative agreement with the CDC, which has enabled continued expansion of the capacity of the Utah Asthma Task Force.



Executive Summary

The goals of the Utah Asthma Program include: increasing awareness and knowledge of asthma; developing and implementing policies that create communities conducive to people with asthma living the highest quality of life; helping individuals with asthma to recognize and reduce exposure to asthma triggers; improving the quality of asthma care; and maintaining an asthma surveillance system. All aspects of these efforts are contained in the Utah Asthma Plan 2012-2016. The Asthma in Utah report connects with key aspects of the Utah Asthma Plan by providing baseline data for decision-making processes.

Key Findings

Asthma Prevalence

- In 2010, 6.9% of children and 9.1% of adults had current asthma.
- Asthma prevalence has followed an increasing trend during the past decade, both in Utah and nationally.

Asthma Symptoms and Management

- Higher percentages of children with current asthma received urgent treatment for asthma during the past 12 months, either in an urgent care center or doctor's office, compared to adults with current asthma.

Asthma Risk Factors

- Significantly higher percentages of Utah adults who were obese reported having current asthma (11.7%), compared to normal and overweight adults (7.2% and 7.7%, respectively).
- More than half of children and adults with current asthma said they allowed pets inside their home (59.6% and 59.9%, respectively).

Occupational Asthma

- Among adults with lifetime asthma, 5.1% said they were told by a health professional that their asthma was work-related.

Asthma in Utah Schools

- Among school-aged children with asthma, 40.9% missed at least one day of school during the past 12 months due to their asthma.
- Only 24.2% of parents of children with current asthma reported that their children had an asthma action plan on file at their school.

Asthma-related Emergency Department Visits

- Male children had significantly higher emergency department visit rates for asthma compared to female children for every age group younger than 15.
- For every adult age group, females had significantly higher emergency department visit rates for asthma compared to males.

Asthma Hospitalizations

- Among adults, asthma hospitalization rates generally increased with age, with the highest hospitalization rate among female adults ages 75+ (12.7 visits per 10,000 population).

Costs of Asthma Care

- Between 2001 and 2010, total charges for asthma hospitalizations in Utah more than doubled (from \$7.9 to \$16.2 million).
- Asthma emergency department charges more than tripled from 2001 to 2009 (from \$2.4 to \$7.3 million).

Asthma Mortality

- In Utah and the United States, the asthma mortality rate appears to have followed a decreasing trend for the years 2001-2010.

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Introduction

Asthma Problem at a Glance

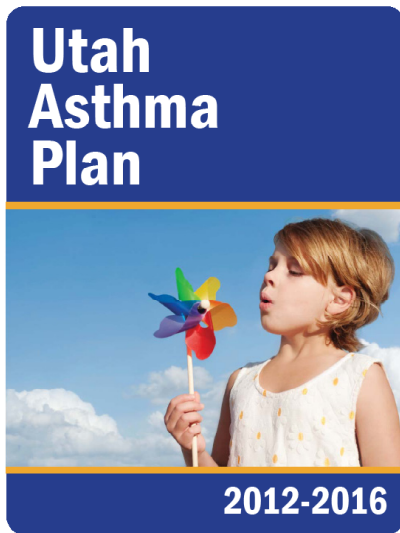
Asthma is a chronic condition that involves increased difficulty in breathing due to airway inflammation and constriction caused by sensitivity to a variety of environmental triggers. Exposure to a trigger (e.g., cold air, cigarette smoke) causes the airways to produce excessive mucus and the muscles 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 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 on 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 on asthma-related issues in Utah.



Introduction



Utah Asthma Plan

In December 2011, 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 emergency department visits and hospitalizations due to asthma and the overall burden of asthma in Utah. The vision statement and goals of the revised asthma plan are as follows:

Utah Asthma Task Force Vision

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

Goals

- **Education:** Increase awareness and knowledge of asthma among individuals with asthma, their caretakers, their health providers, and individuals in other settings who interact closely with them.
- **Policy:** Develop and implement policies that create communities conducive to people with asthma living the highest quality of life.
- **Environment:** Individuals with asthma will be able to recognize and reduce sources of contaminants, identify and reduce the risk of exposure to personal triggers, and have a management plan for unavoidable triggers.
- **Health care access:** Reach providers and patients to improve asthma education, ensure appropriate utilization of resources, and improve quality of care using research and National Asthma Education and Prevention Program guidelines.
- **Data and monitoring:** Assure availability of quality data to guide interventions that improve quality of life for people with asthma.

The Asthma in Utah Burden Report 2012 contains asthma surveillance data that will help guide interventions to achieve the goals and vision of the Utah Asthma Plan.

Healthy People 2020 Objectives

Healthy People 2020 (HP2020) 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 11 years to achieve the objectives contained in HP2020. This effort will continue and the burden report is part of the ongoing information needed to track such measures. The asthma objectives are:

Objective RD-1: Reduce asthma deaths

Objective RD-2: Reduce hospitalizations for asthma

Objective RD-3: Reduce hospital emergency department visits for asthma

Objective RD-4: Reduce activity limitations among persons with current asthma

Objective RD-5: Reduce the proportion of persons with asthma who miss school or work days

Objective RD-6: Increase the proportion of persons with current asthma who receive formal patient education

Objective RD-7: Increase the proportion of persons with current asthma who receive appropriate asthma care according to National Asthma Education and Prevention Program (NAEPP) guidelines

Objective RD-8: Increase the number of States and Territories with a comprehensive asthma surveillance system for tracking asthma cases, illness, and disability at the State level

Asthma Prevalence

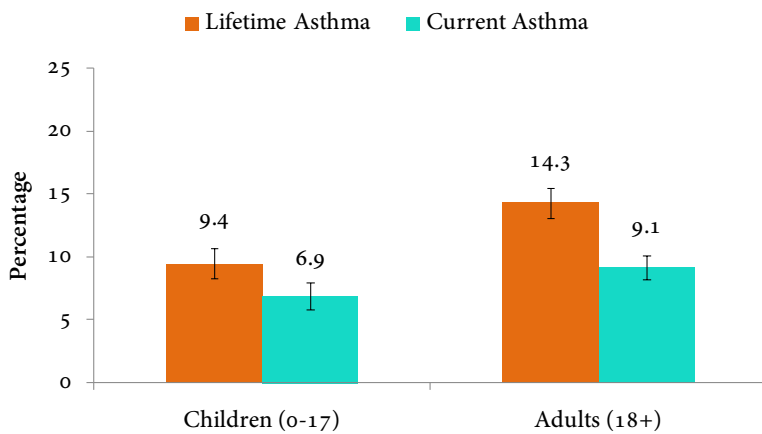


Asthma prevalence is one of the foremost indicators to measure and track the burden of disease among population groups. Tracking asthma prevalence across age groups, gender, geographic areas, income and education levels, and by racial and ethnic groups makes it possible to target the most vulnerable sections of the population. For example, Utah has a higher prevalence of asthma in certain urban and rural health districts when compared to the overall asthma prevalence in the state. Since 2001, asthma prevalence has been on an upward trend in Utah, which is similar to increasing trends nationwide.

Key Findings

- In 2010, 6.9% of children and 9.1% of adults had current asthma.
- Male children appeared to have a higher prevalence of lifetime and current asthma compared to female children, whereas adult females seemed to have a higher lifetime and current asthma prevalence compared to adult males.
- Asthma prevalence has followed an increasing trend during the past decade, both in Utah and nationally.
- Among adults of different ethnicities, the current asthma prevalence for the Hispanic population (5.2%) was the lowest compared to the state and other ethnic populations.
- The following three geographic small areas reported current asthma prevalence that was significantly higher compared to the state: Carbon/Emery Counties, Magna, and West Valley West.

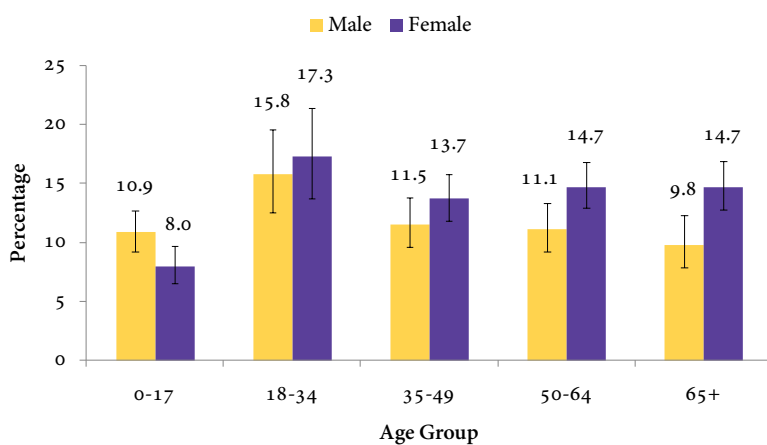
Asthma Prevalence



Source: Utah BRFSS, 2010. Crude prevalence is presented with 95% confidence intervals.

Figure 1. Prevalence of Lifetime and Current Asthma, Utah, 2010

Lifetime asthma is defined as having ever been diagnosed with asthma by a doctor or other health professional, regardless of whether or not that individual still has asthma. 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. In 2010, 6.9% of children and 9.1% of adults reported having current asthma. Significantly higher percentages reported having lifetime asthma.



Source: Utah BRFSS, 2010. Crude prevalence is presented with 95% confidence intervals.

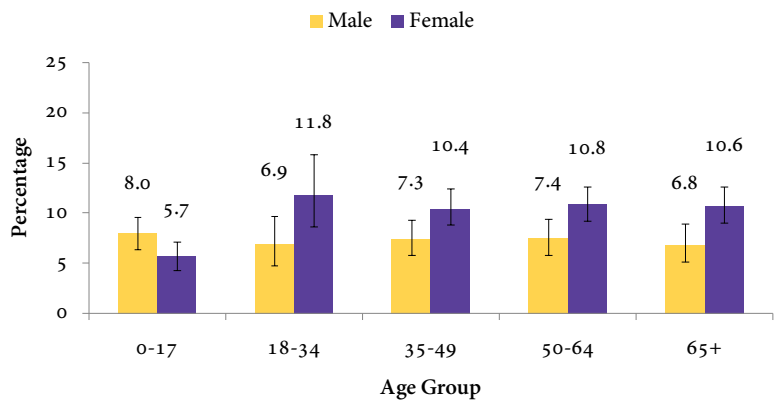
Figure 2. Prevalence of Lifetime Asthma by Age and Sex, Utah, 2010

In 2010, adult females appeared to have a higher prevalence of lifetime asthma when compared to males for every age group. The opposite appeared to be true among children ages 0-17. However, differences were not statistically significant.

Asthma Prevalence

Figure 3. Prevalence of Current Asthma by Age and Sex, Utah, 2010

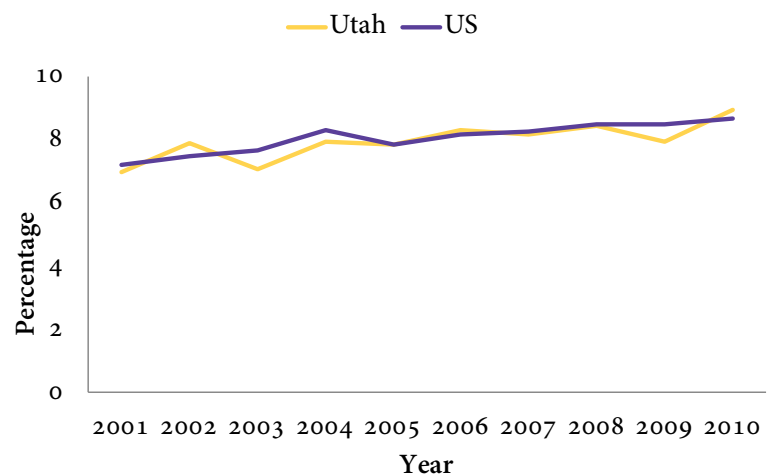
Males ages 0-17 appeared to have a higher prevalence of current asthma when compared to females. For adults ages 18 and older, females seemed to have a higher prevalence of asthma for every age group. However, the only significant difference in asthma prevalence between males and females was found among adults ages 65 and older.



Source: Utah BRFSS, 2010. Crude prevalence is presented with 95% confidence intervals.

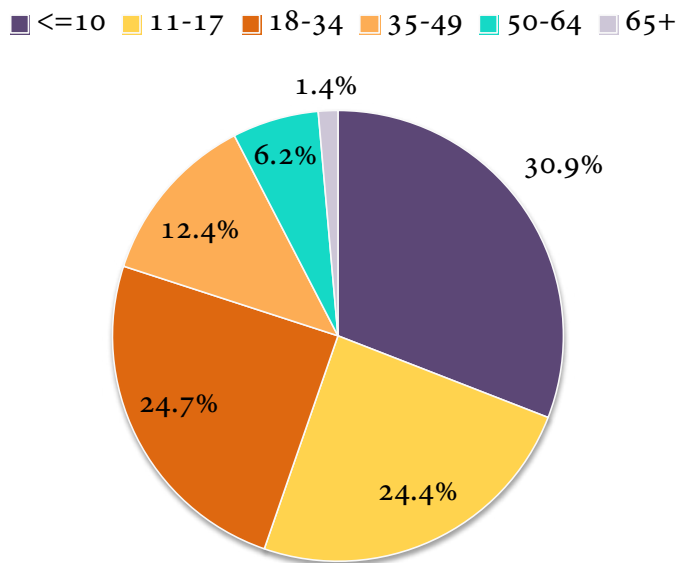
Figure 4. Prevalence of Current Asthma Among Adults Ages 18 and Older, U.S. and Utah, 2001-2010

From 2001 to 2010, asthma prevalence increased among adults both in Utah and nationwide. Adult asthma prevalence increased by 28.6% in Utah during that time period, from 7.0% to 9.0%. Utah adult asthma prevalence has remained similar to national adult asthma prevalence.

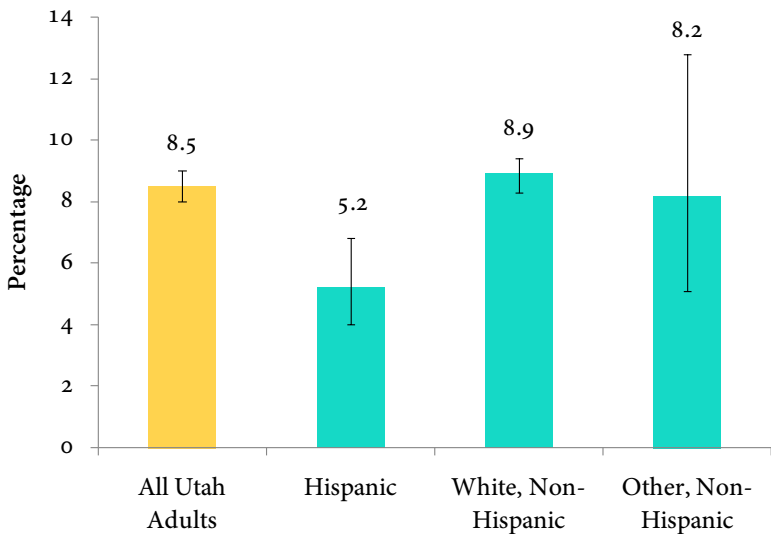


Source: Utah and U.S. BRFSS, 2001-2010. Age-adjusted prevalence.

Asthma Prevalence



Source: Utah BRFSS, 2010. Crude prevalence.



Source: Utah BRFSS, 2008-2010 combined. Age-adjusted prevalence is presented with 95% confidence intervals.

Figure 5. Age at First Diagnosis Among Adults Who Were Ever Diagnosed with Asthma, Utah, 2010

Approximately half of Utah adults who have ever been diagnosed with asthma were diagnosed by age 17 (55.3%), and four-fifths (80.0%) reported being diagnosed by age 34.

Figure 6. Prevalence of Current Asthma by Ethnicity, Utah Adults, 2008-2010

Asthma prevalence varied among Utah’s ethnic populations. Hispanic adults reported the lowest asthma prevalence (5.2%), which was 38.8% lower than the statewide adult asthma prevalence (8.5%). 2008-2010 data were combined to obtain reliable estimates. Among children, reliable estimates for ethnicity were unavailable.

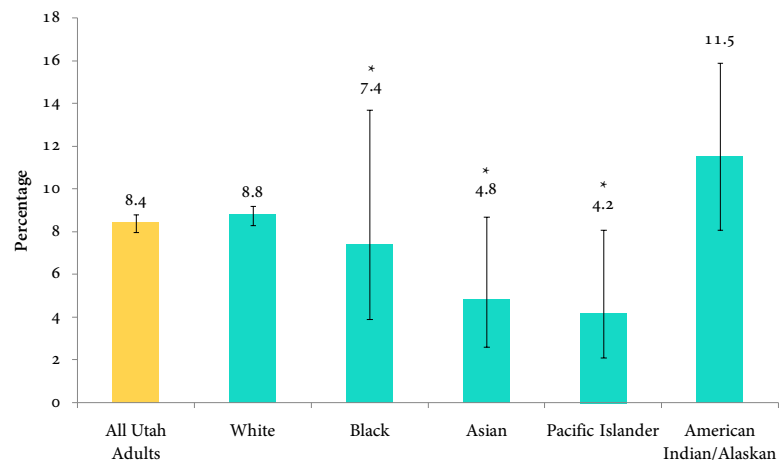
Asthma Prevalence

Figure 7. Prevalence of Current Asthma by Race, Utah Adults, 2006-2010

Adult asthma prevalence appears to vary among populations differing by race. Pacific Islanders reported the lowest asthma prevalence (4.2%), while American Indian/Alaskan Natives reported the highest prevalence (11.5%). However, the only differences that were statistically significant were between White and Pacific Islander populations. True differences may exist between other racial groups, but may be masked due to small populations for some races and resulting large confidence intervals that overlap. Years 2006-2010 were combined to obtain reportable estimates for adults. Reliable estimates were unavailable for children.

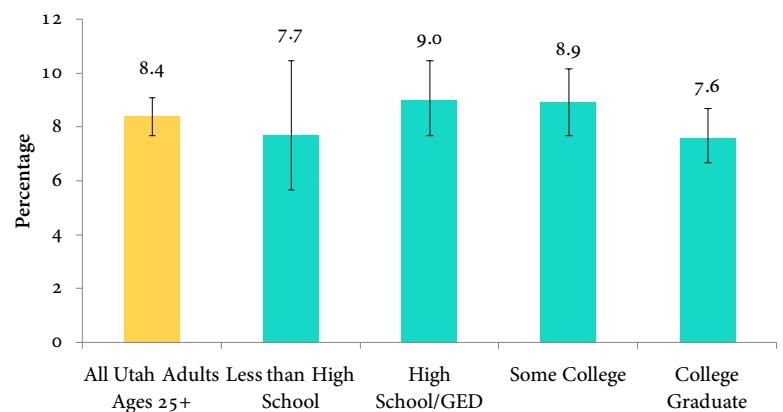
Figure 8. Prevalence of Current Asthma by Education Level, Utah Adults Ages 25 and Older, 2010

Asthma prevalence was compared based on highest education level achieved among adults ages 25 and older. No significant differences in asthma prevalence were apparent based on education.



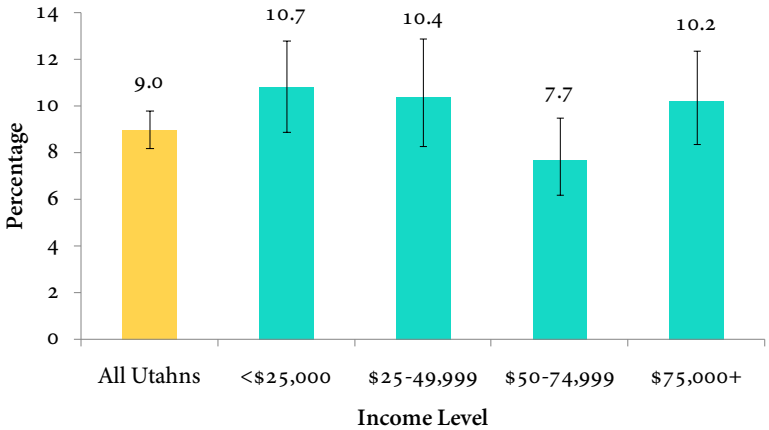
Source: Utah BRFSS, 2006-2010 combined. Age-adjusted prevalence is presented with 95% confidence intervals.

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



Source: Utah BRFSS, 2010. Age-adjusted prevalence is presented with 95% confidence intervals.

Asthma Prevalence



Source: Utah BRFSS, 2010. Age-adjusted prevalence is presented with 95% confidence intervals.

Figure 9. Prevalence of Current Asthma by Income Level, Utah Adults Ages 18 and Older, 2010

There were no statistically significant differences in asthma prevalence among Utah adults, based on reported income level.

Asthma Prevalence

Figure 10. Prevalence of Current Asthma by Small Area, Utah Adults, 2006-2010

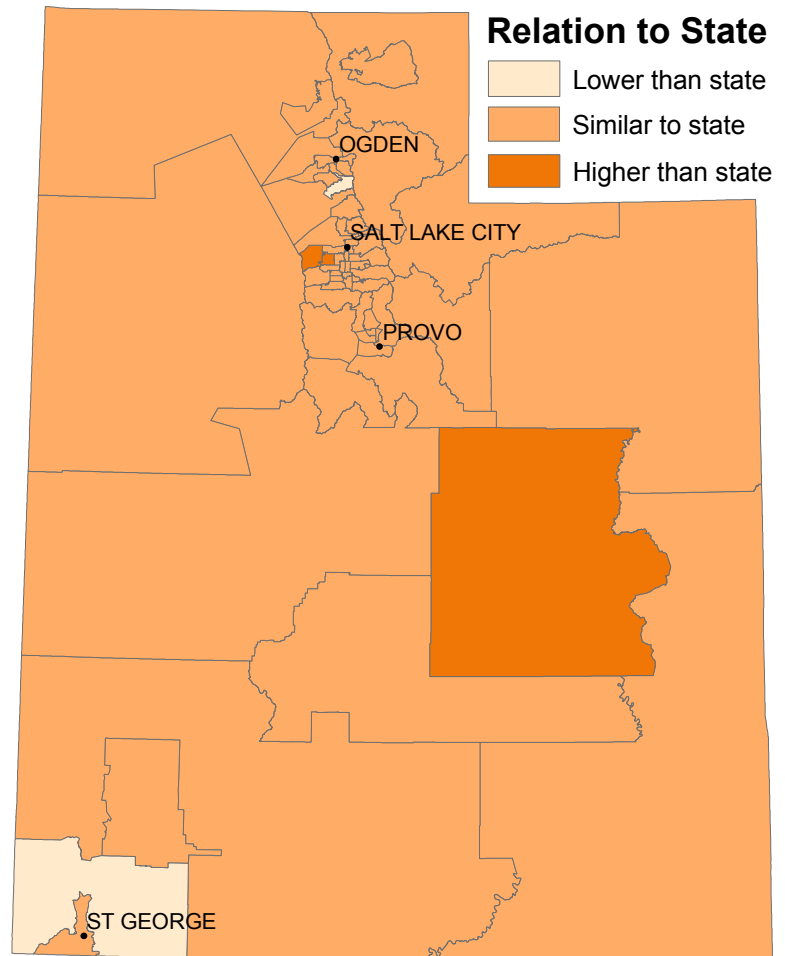


Table 1. Small Areas with Significantly Different Asthma Prevalence Compared to State, Utah 2006-2010

Area Name	Age-adjusted Prevalence with 95% CI*
State	8.4 (8.0-8.8)
Lower than State	
Layton	5.5 (3.9-7.7)
Other Washington County	5.0 (3.3-7.6)
Higher than State	
Carbon/Emery Counties	11.6 (9.6-14.1)
Magna	13.4 (8.9-19.7)
West Valley West	12.8 (9.8-16.5)

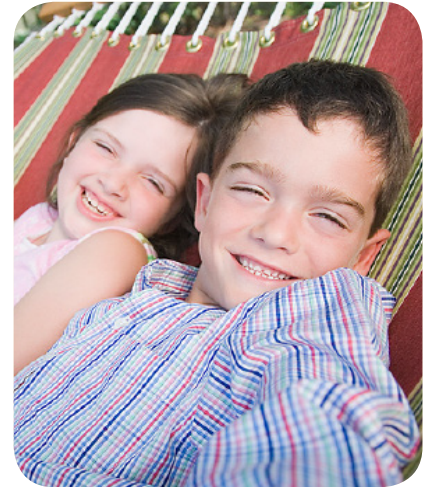
*95% Confidence Interval

Source: Utah BRFSS, 2006-2010 combined. Age-adjusted prevalence is presented. Due to small area boundary changes that occurred in 2009, prevalence for the following small areas was calculated using only data from 2009-2010: W. Jordan Northeast, W. Jordan Southeast, and West Jordan West/Copperton.

Asthma Symptoms and Management

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 days, inability to participate in physical activities, and hospitalizations due to asthma.¹ Through appropriate medication use, medical care, and self-management, the majority of asthma symptoms are preventable.²

Data in this section provide information on asthma symptoms and management in Utah. They support the Utah Asthma Plan by helping to increase awareness of asthma symptoms experienced by people with asthma and by identifying areas where improvement in asthma management may be needed.



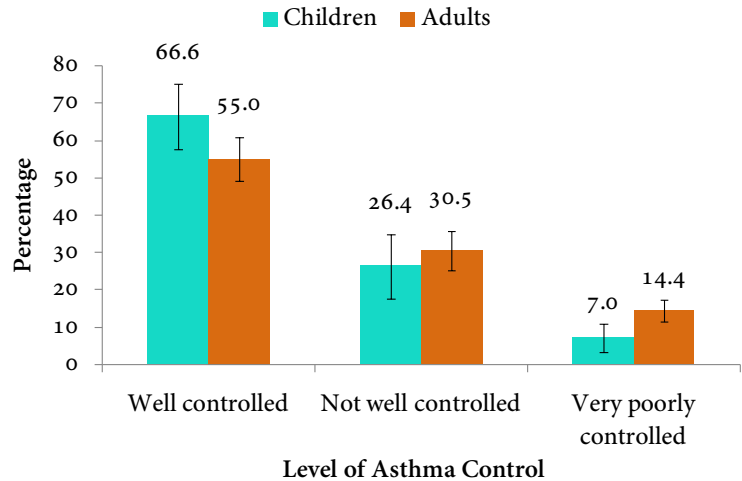
Key Findings

- Two-thirds of children (66.6%) and just over half of adults (55.0%) with current asthma reported that their asthma was well controlled.
- Higher percentages of adult females with current asthma reported experiencing an asthma attack during the past 12 months compared to adult males for every age group.
- Among school-aged children with asthma, 40.9% missed at least one day of school during the past 12 months due to asthma.
- Higher percentages of children with current asthma received urgent treatment for asthma during the past 12 months, either in an urgent care center or doctor's office, compared to adults with current asthma.
- Significantly higher percentages of children with current asthma have ever received an asthma action plan (42.8%), compared to adults with current asthma (23.8%).

Asthma Symptoms and Management

Figure 11. Level of Asthma Control Among Children and Adults with Current Asthma, Utah, 2009-2010

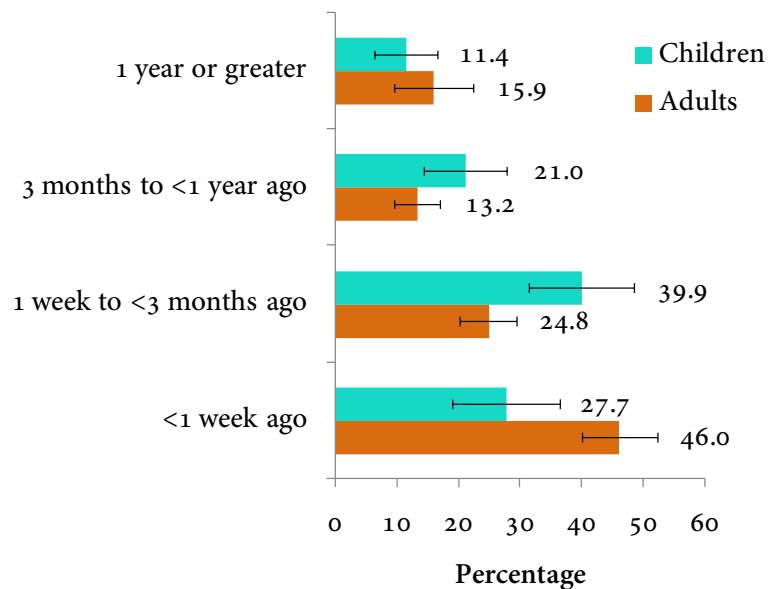
Using asthma symptoms, nighttime awakenings, and rescue medication use as measures of asthma control, 66.6% of children and 55.0% of adults with asthma met criteria for well-controlled asthma (control definitions are listed below Figure 11).



Source: Utah BRFS Adult and Child Call-back Surveys, 2009-2010 combined. Crude percentages are presented with 95% confidence intervals.
 Note: Asthma control level was determined based on NAEPP guidelines.
 Well controlled: Asthma symptoms ≤ 8 days in past 30 days, nighttime awakenings ≤ 2 times in past 30 days, and rescue medication used ≤ 0.29 times per day.
 Not well controlled: Asthma symptoms > 8 days in past 30 days, nighttime awakenings 3-12 times in the past 30 days, or rescue medication used > 0.29 to < 2.00 times per day.
 Very poorly controlled: Asthma symptoms every day in the past 30 days and throughout the day, nighttime awakenings ≥ 13 times in the past 30 days, or rescue medication used ≥ 2.00 times per day.

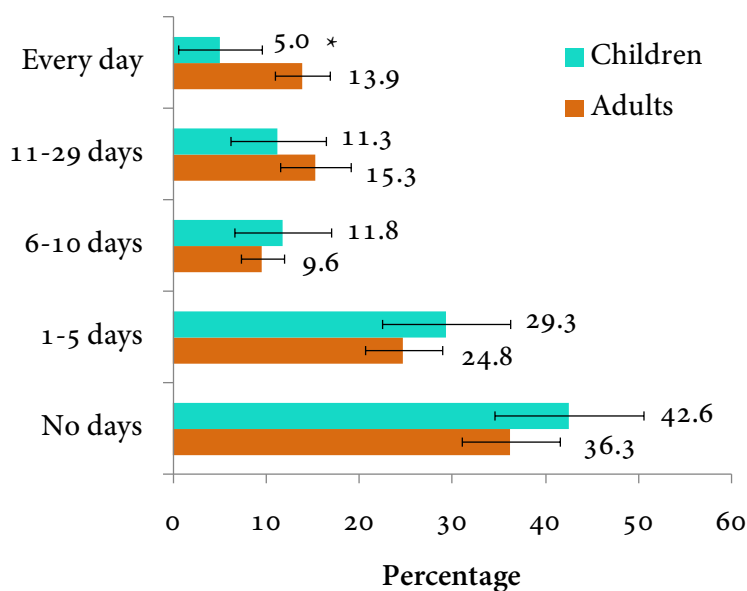
Figure 12. Most Recent Asthma Symptoms, Children and Adults with Current Asthma, Utah, 2009-2010

Nearly half (46.0%) of adults experienced their most recent asthma symptoms less than one week ago, compared to only 27.7% of children who experienced symptoms during the past week. Around one in six adults (15.9%) and one in 10 children (11.4%) with current asthma reported remaining symptom-free during the past year.



Source: Utah BRFS Adult and Child Call-back Surveys, 2009-2010 combined. Crude percentages are presented with 95% confidence intervals.

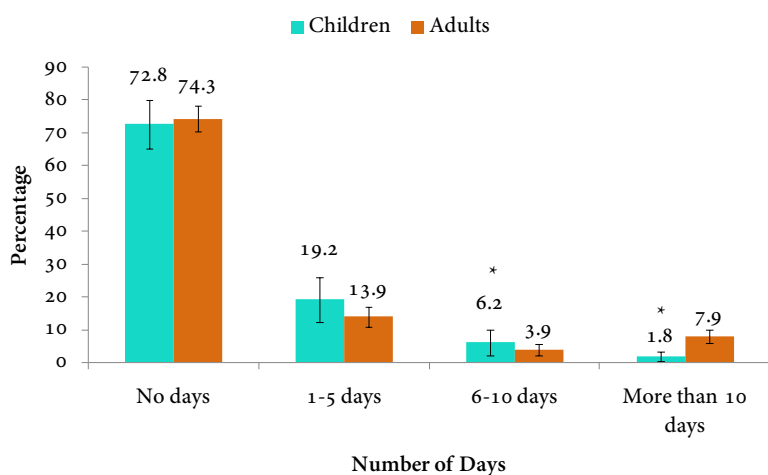
Asthma Symptoms and Management



Source: Utah BRFSS Adult and Child Call-back Surveys, 2008-2010 combined. Crude percentages are presented with 95% confidence intervals.

Figure 13. Number of Days with Asthma Symptoms During Past 30 Days, Utah Children and Adults with Current Asthma, 2008-2010

More than one-third of children and adults (42.6% and 36.3%) said they experienced no asthma symptoms during the past 30 days. 5.0% of children and 13.9% of adults reported experiencing asthma symptoms every day.



Source: Utah BRFSS Adult and Child Call-back Surveys, 2008-2010 combined. Crude percentages are presented with 95% confidence intervals.

*The estimate has a coefficient of variation >30% and should be interpreted with caution.

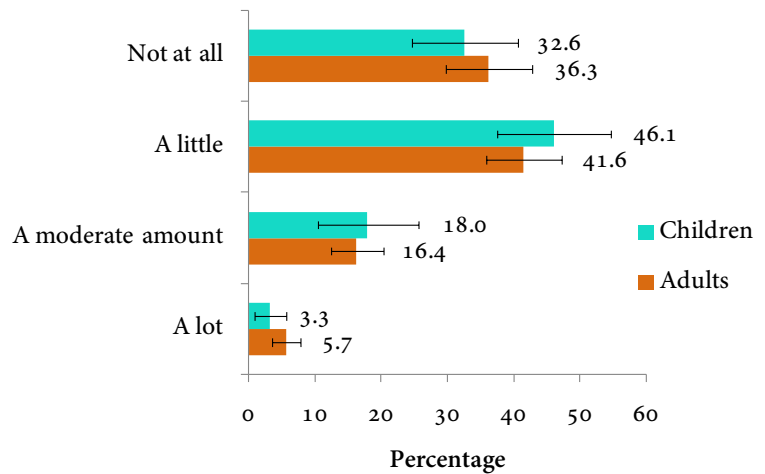
Figure 14. Number of Days of Lost Sleep in the Past 30 Days Due to Asthma Symptoms, Utah Children and Adults with Current Asthma, 2008-2010

Among adults with current asthma, 7.9% reported having lost more than 10 days of sleep during the past 30 days due to asthma symptoms. The majority of children and adults with current asthma (72.8% and 74.3%, respectively) reported no days of lost sleep due to asthma during the past 30 days.

Asthma Symptoms and Management

Figure 15. Activity Limitations Due to Asthma During Past 12 Months, Utah Children and Adults with Current Asthma, 2009-2010

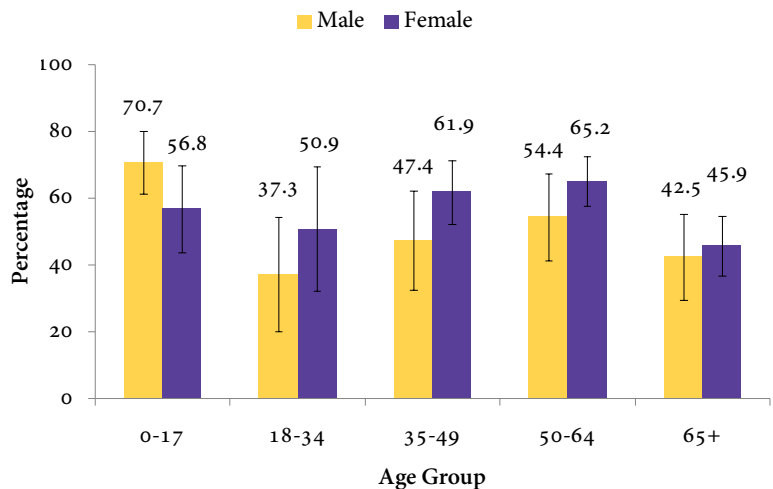
Individuals with asthma were asked if their asthma had limited their activities a lot, a moderate amount, a little, or not at all during the past 12 months. Nearly half of respondents indicated that their activities had been limited a little due to asthma (46.1% of children, 41.6% of adults). Around one-third reported no activity limitations (32.6% of children, 36.3% of adults).



Source: Utah BRFSS Adult and Child Call-back Surveys, 2009-2010 combined. Crude percentages are presented with 95% confidence intervals.

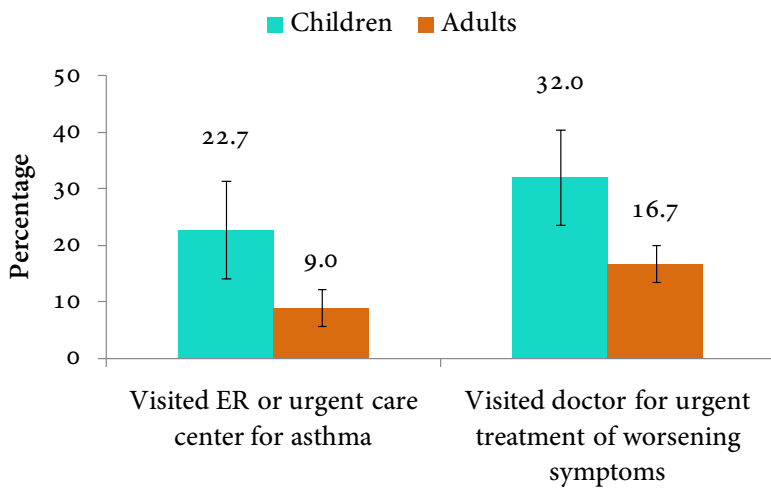
Figure 16. Asthma Attack During Past 12 Months, Utah Residents with Current Asthma, 2009-2010

Among children in the 0-17 age group, a higher percentage of males reported experiencing an asthma attack during the past 12 months compared to females (70.7% vs. 56.8%). For all adult age groups, a higher percentage of females reported experiencing an asthma attack, compared to males (differences were not statistically significant).



Source: Utah BRFSS Adult and Child Call-back Surveys, 2009-2010 combined. Crude percentages are presented with 95% confidence intervals.

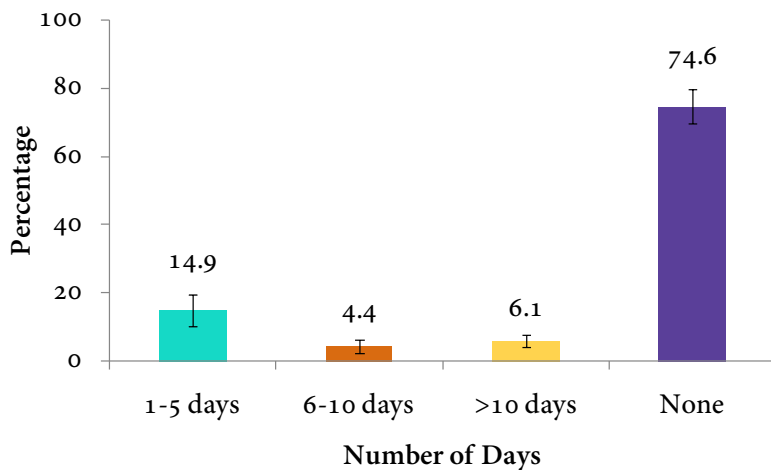
Asthma Symptoms and Management



Source: Utah BRFSS Adult and Child Call-back Surveys, 2009-2010 combined. Crude percentages are presented with 95% confidence intervals.

Figure 17. Received Urgent Treatment for Asthma During Past 12 Months, Children and Adults with Current Asthma, Utah, 2009-2010

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 five children (22.7%) and nearly one in 10 adults (9.0%) with current asthma reported visiting an emergency room or urgent care center for asthma within the past 12 months. Even higher percentages reported visiting a health professional for urgent treatment of worsening symptoms. Higher percentages of children reported receiving urgent treatment for asthma within the past 12 months, compared to adults.



Source: Utah BRFSS Adult Call-back Survey, 2009-2010 combined. Crude percentages are presented with 95% confidence intervals.

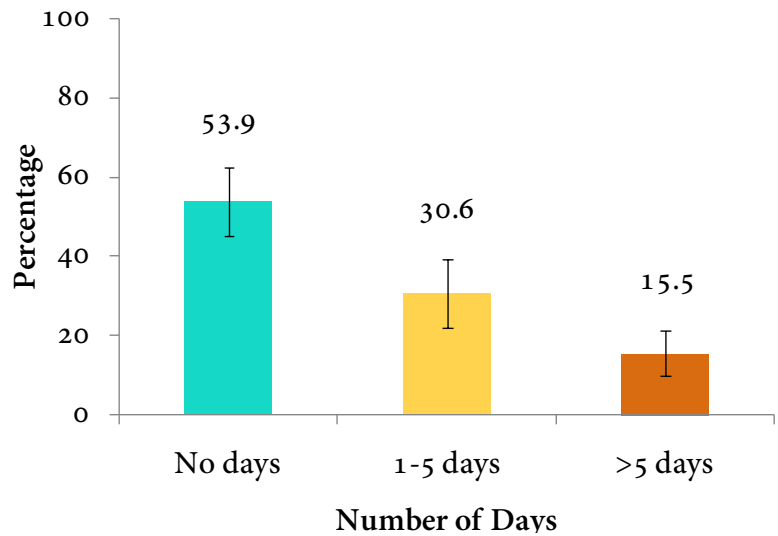
Figure 18. Number of Days Unable to Work or Carry Out Usual Activities During the Past 12 Months Due to Asthma, Adults With Current Asthma, Utah, 2009-2010

Among adults with current asthma, 6.1% 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 (74.6%) 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 Symptoms and Management

Figure 19. Number of Missed School Days Due to Asthma During Past 12 Months, Utah, School-aged Children with Current Asthma, 2009-2010

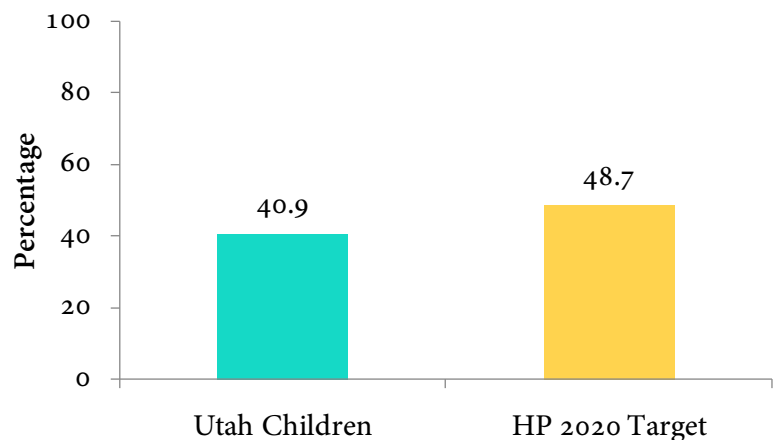
Among parents of school-aged children with asthma, nearly one-third (30.6%) reported that their child missed 1-5 days of school because of asthma during the past 12 months, and 15.5% said their child missed more than 5 days due to asthma. More than half of parents (53.9%) reported that their child missed no days of school due to asthma.



Source: Utah BRFSS Child Call-back Survey, 2009-2010 combined. Crude percentages are presented with 95% confidence intervals.

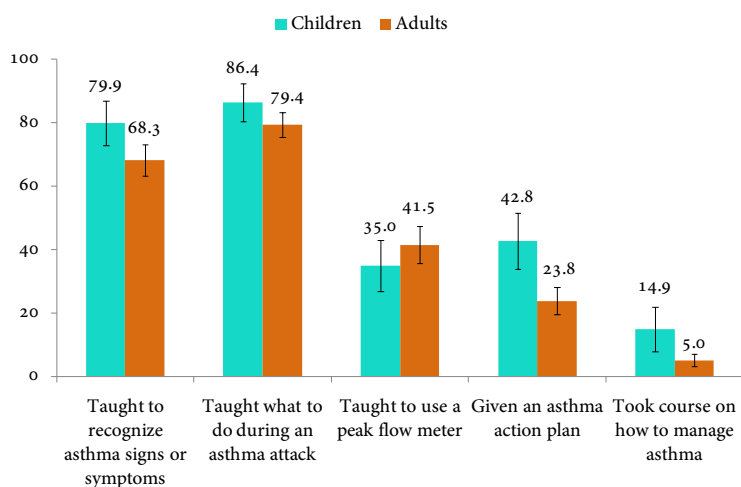
Figure 20. School-aged Children with Current Asthma Who Missed School During the Past 12 Months Due to Asthma, Utah Compared to Healthy People 2020 Target, 2010

In 2010, 40.9% of Utah children with current asthma reported missing school during the past 12 months due to their asthma. This percentage was lower than the national target.



Source: Utah BRFSS Child Call-back Survey, 2010 and Healthy People 2020 Objectives.

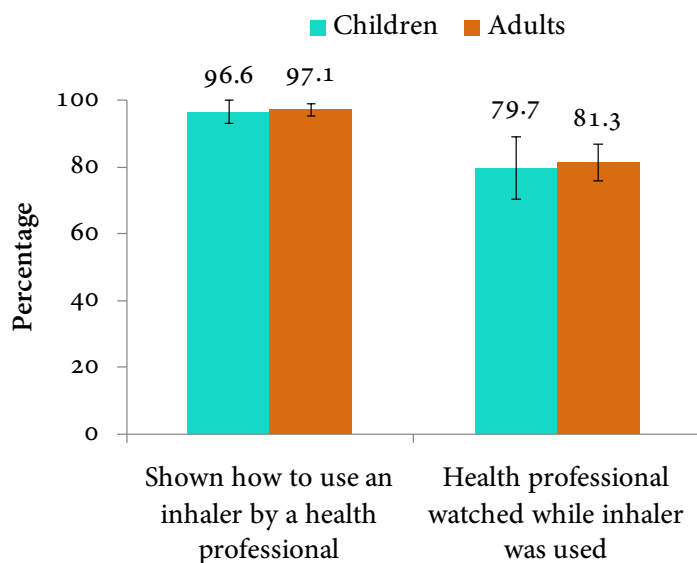
Asthma Symptoms and Management



Source: Utah BRFSS Adult and Child Call-back Surveys 2009-2010 combined. Crude percentages are presented with 95% confidence intervals.

Figure 21. Asthma Self-management Education, Children and Adults with Current Asthma, Utah, 2009-2010

During 2009-2010, it was reported that the majority of adults and children had been taught by a health professional to recognize early signs or symptoms of an asthma episode or what to do during an asthma attack. Fewer than half of adults and children with current asthma reported having been taught to use a peak flow meter, been given an asthma action plan, or taken a course on how to manage asthma.



Source: Utah BRFSS Adult and Child Call-back Surveys, 2010. Crude percentages are presented with 95% confidence intervals.

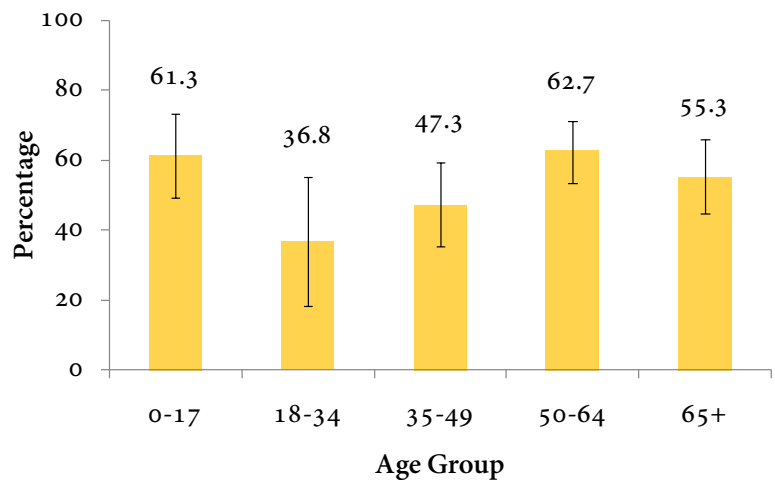
Figure 22. Taught to Use Inhaler by a Health Professional, Children and Adults Who Ever Used an Inhaler for Asthma, Utah, 2010

Among children and adults who ever used an inhaler, nearly all said they were taught by a health professional to use the inhaler (96.6% of children and 97.1% of adults). Significantly lower percentages reported being watched by a health professional as they used the inhaler (79.7% of children and 81.3% of adults).

Asthma Symptoms and Management

Figure 23. Received Routine Asthma Checkup During Past 12 Months, Utah Residents With Current Asthma, 2010

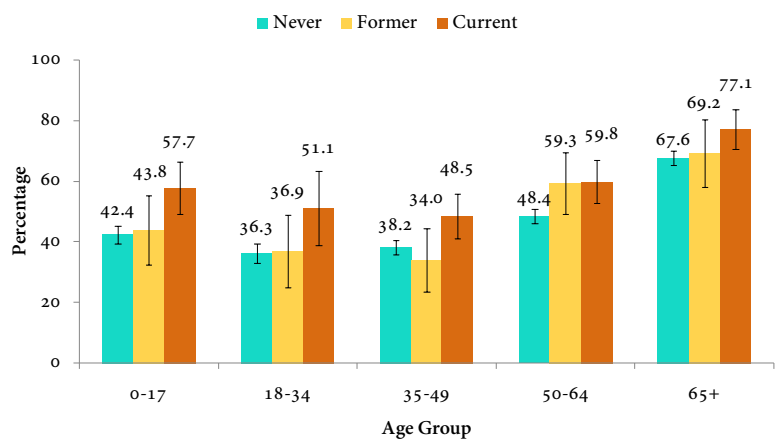
Among those with current asthma, the highest percentages of people with asthma who reported receiving a routine asthma checkup during the past year were children ages 0-17 (61.3%) and adults ages 50-64 (62.7%). However, differences between age groups were not statistically significant.



Source: Utah BRFSS Adult and Child Call-back Surveys, 2010. Crude percentages are presented with 95% confidence intervals.

Figure 24. Percentage of Utah Residents Who Received an Influenza Vaccination During the Past 12 Months, by Asthma Status, 2010

For every age group except 18-34, a significantly higher percentage of adults with current asthma reported receiving a flu vaccination within the past 12 months compared to adults who had never been diagnosed with asthma. These data suggest that messages emphasizing the importance of flu vaccinations, especially for more vulnerable populations such as people with asthma, have been somewhat effective.



Source: Utah BRFSS, 2010. Crude percentages are presented with 95% confidence intervals.

Asthma Risk Factors

An asthma attack can occur when someone with asthma is exposed to certain things in the environment that affect his/her asthma. These are called asthma triggers. Asthma triggers vary from person to person. However, some common asthma triggers include tobacco smoke, dust mites, cockroach allergens, pets, mold, and wood smoke.³ People with asthma should seek to reduce exposure to these triggers and thus reduce the risk of an asthma attack.

Several studies have shown an association between asthma prevalence and obesity, with higher asthma prevalence among obese individuals compared to those who were of normal weight^{4,5}. However, it is unclear which disease comes first and whether obesity is a cause or result of asthma. Studies have shown that, among people with asthma, obesity can be a risk factor for poorer outcomes, including poorer asthma-related quality of life, poorer asthma control, and a history of asthma-related hospitalizations.^{5,6}

Utah data were analyzed to assess exposure to smoking, indoor environmental factors, and obesity as risk factors for asthma.

Key Findings

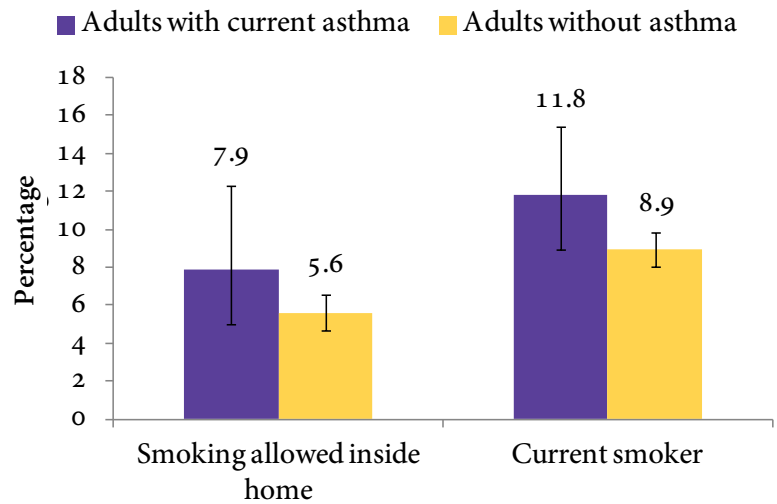
- Among adults with current asthma, 11.8% reported being a current smoker and 7.9% reported that smoking was allowed inside their home.
- Significantly higher percentages of Utah adults who were obese reported having current asthma (11.7%), compared to normal weight and overweight adults (7.2% and 7.7%, respectively).
- More than half of children and adults with current asthma said they allowed pets inside their home (59.6% and 59.9%, respectively).



Asthma Risk Factors

Figure 25. Percentage of Utah Adults Who Allow Smoking Inside the Home or are Current Smokers, by Current Asthma Diagnosis, 2010

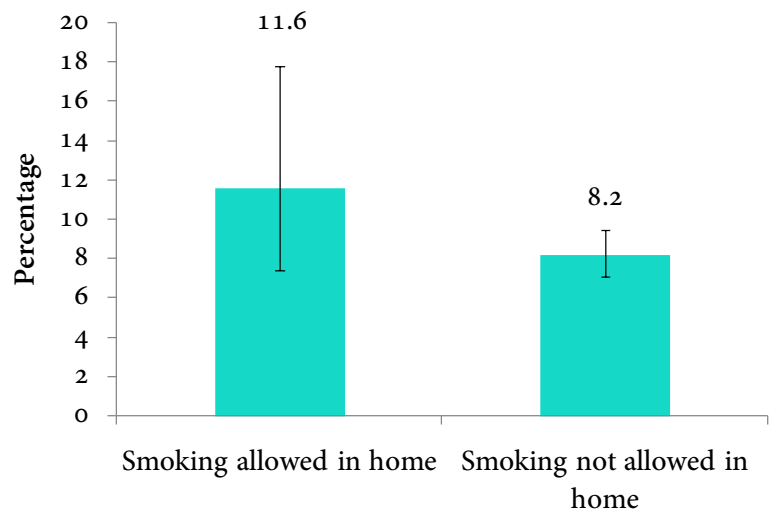
Though exposure to tobacco smoke is a common asthma trigger, higher percentages of adults with current asthma reported being current smokers or allowing smoking in their home, compared to Utah's adult population without asthma (differences were not statistically significant).



Source: Utah BRFSS, 2010. Crude percentages are presented with 95% confidence intervals.

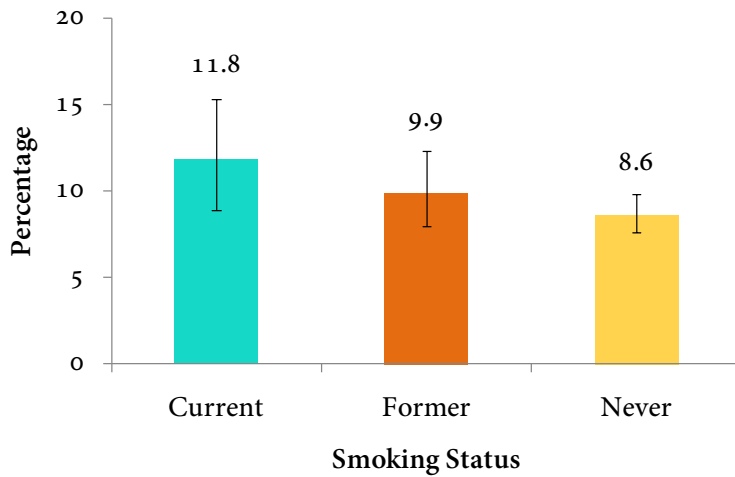
Figure 26. Current Asthma Prevalence Based on Rules About Smoking in Home, Utah Adults, 2010

Among adults who allowed smoking in the home, higher percentages reported being diagnosed with current asthma, compared to adults who did not allow smoking in the home (11.6% vs. 8.2%; differences were not statistically significant).



Source: Utah BRFSS, 2010. Crude percentages are presented with 95% confidence intervals.

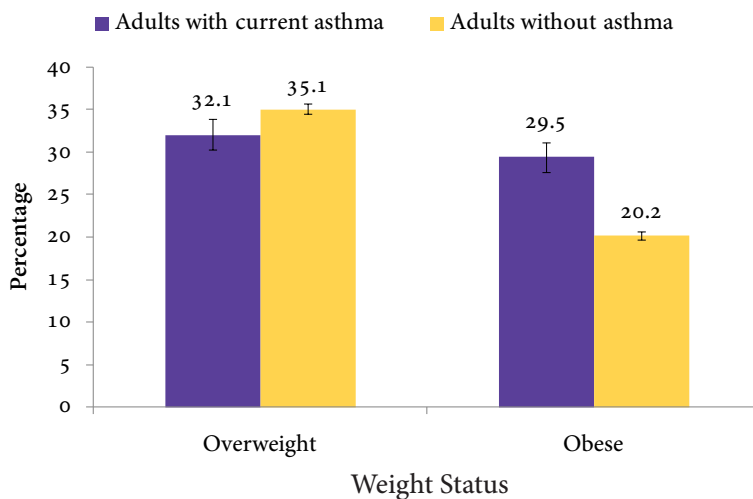
Asthma Risk Factors



Source: Utah BRFSS, 2010. Crude percentages are presented with 95% confidence intervals.

Figure 27. Current Asthma Prevalence Based on Smoking Status, Utah Adults, 2010

Though differences were not statistically significant, data suggest that higher percentages of adults who were current or former smokers had current asthma (11.8% and 9.9%), compared to adults who had never smoked (8.6%).



Source: Utah BRFSS, 2010. Crude percentages are presented with 95% confidence intervals. Overweight adults had a body mass index (BMI) of 25-29.9. Obese adults had a BMI of 30 or greater.

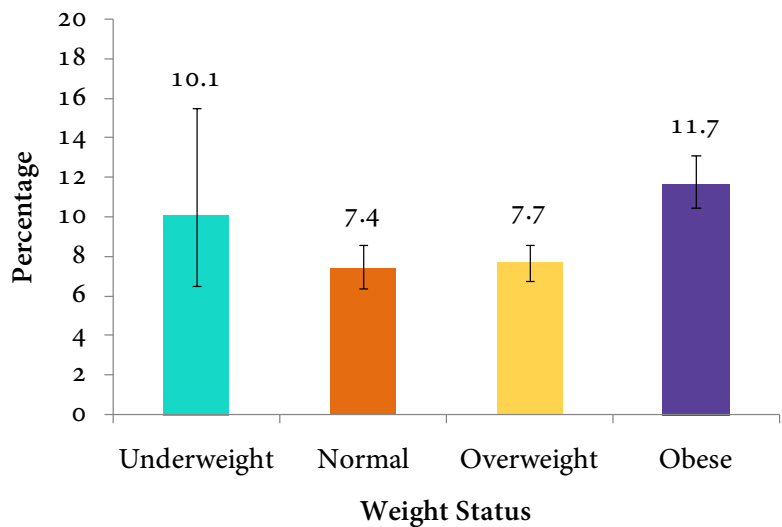
Figure 28. Percentage of Utah Adults Who are Overweight or Obese, by Current Asthma Diagnosis, 2010

Significantly higher percentages of adults with current asthma reported being obese compared to adults without asthma (29.5% vs. 20.2%).

Asthma Risk Factors

Figure 29. Current Asthma Prevalence Based on Weight Status, Utah Adults, 2009-2010

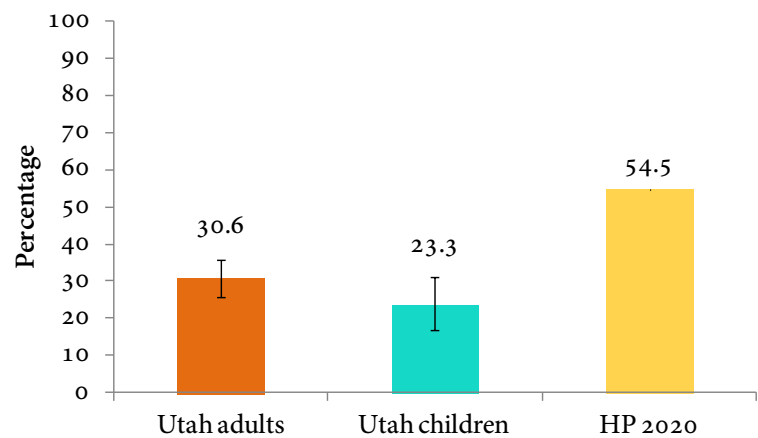
Among Utah adults who were obese, significantly higher percentages reported having current asthma (11.7%), compared to normal and overweight adults (7.2% and 7.7%, respectively).



Source: Utah BRFSS, 2009-2010 combined. Crude percentages are presented with 95% confidence intervals. Weight categories for adults were based on the following BMI: underweight = <18.5; normal = 18.5-24.9; overweight = 25-29.9; obese = 30 or greater.

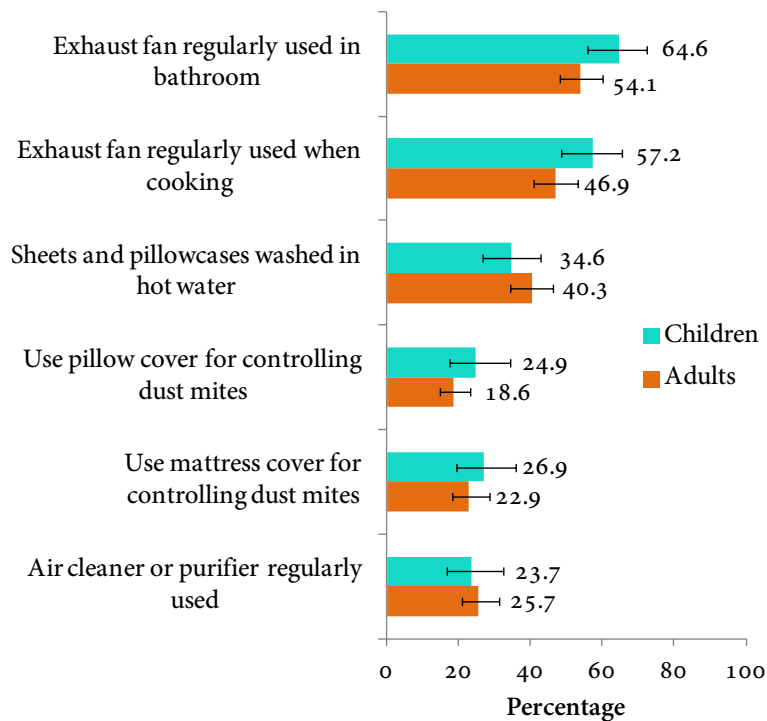
Figure 30. Adults and Children with Current Asthma Who have been Advised by a Health Professional to Make Changes to Their Environment, Utah Compared to Healthy People 2020 Target, 2009-2010

During 2009-2010, the percentages of Utah adults and children who had been advised to make changes to their home, school, or work environments to reduce exposure to asthma irritants were lower than the national Healthy People 2020 target of 54.5%.



Source: BRFSS Adult and Child Call-back Surveys, 2009-2010 combined. Crude percentages are presented. Utah estimates are shown with 95% confidence intervals.

Asthma Risk Factors



Source: BRFSS Adult and Child Call-back Surveys, 2009-2010 combined. Crude rates are presented with 95% confidence intervals.
 Note: Categories are not mutually exclusive and do not add up to 100%.

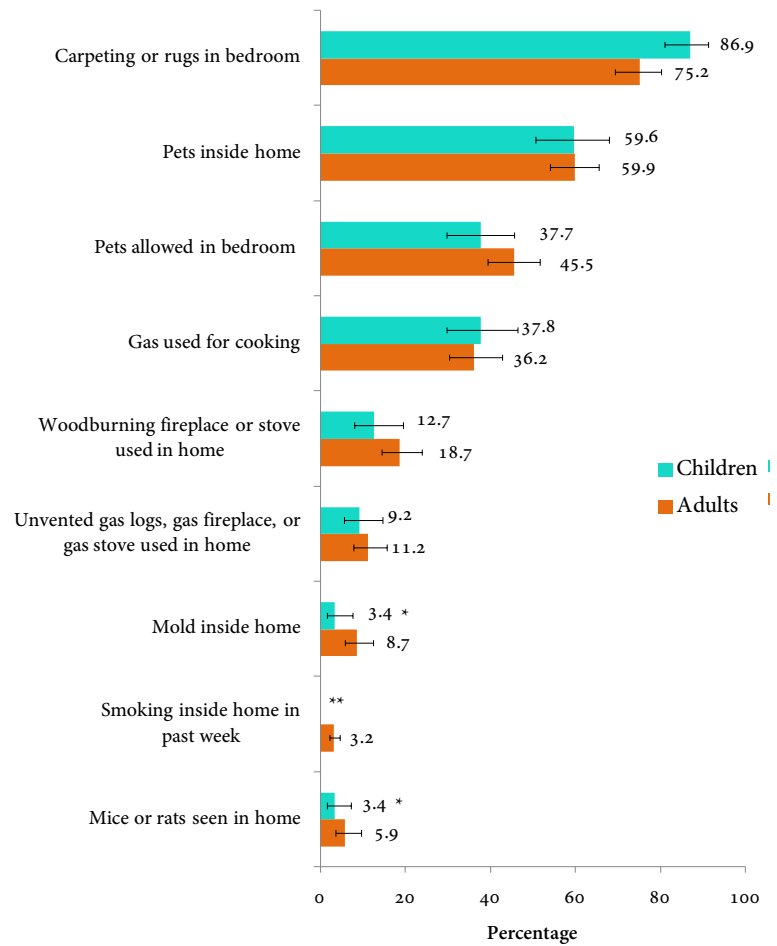
Figure 31. Environmental Modifications in the Homes of Children and Adults with Current Asthma, Utah, 2009-2010

Indoor environmental modifications are actions taken in an indoor environment to control asthma triggers. The most prevalent indoor modifications reported among adults and children with current asthma included using an exhaust fan regularly in the bathroom or when cooking, and washing sheets and pillowcases in hot water. Other actions to control indoor triggers were implemented in one-third or fewer homes.

Asthma Risk Factors

Figure 32. Environmental Triggers in the Homes of Children and Adults with Current Asthma, Utah, 2009-2010

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. Fewer than 10% reported exposure to mold, smoking, or rodents. Reported exposure to indoor asthma triggers was similar for adults and children.



Source: BRFSS Adult and Child Call-back Surveys, 2009-2010 combined. Crude rates are presented with 95% confidence intervals.

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

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

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

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.⁷ 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.⁸

The Utah Asthma Program tracks occupational asthma through the Behavioral Risk Factor Surveillance System. Data were analyzed to assess the prevalence of work-related asthma in Utah and to assess exposure to workplace environments that may have caused or exacerbated asthma.

Key Findings

- Among adults with lifetime asthma, 5.1% said they were told by a health professional that their asthma was work-related.
- 5.0% of adults with lifetime asthma said they had ever changed or quit a job because it caused or made their asthma worse.



Occupational Asthma

Figure 33. Prevalence of Work-related Asthma Among Adults with Lifetime Asthma, Utah, 2009-2010

Approximately one in 20 Utah adults (5.1%) who were ever diagnosed with asthma said they were told by a health professional that their asthma was work-related. A slightly higher percentage (7.2%) reported having told a health professional their asthma was work-related. Percentages for males and females were not significantly different.

Only 5.0% of adults said they had ever changed or quit a job because it caused or made their asthma worse, though much higher percentages reported having been in a job that caused or made their asthma worse (18.5% and 30.7%).



Source: BRFSS Adult Call-back Survey, 2009-2010 combined. Crude percentages are presented with 95% confidence intervals.

Asthma in Utah Schools

The Centers for Disease Control and Prevention (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, the chance 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.
- 6) Coordinate school, family, and community efforts to better manage asthma symptoms and reduce school absences among students with asthma.⁹



Key Findings

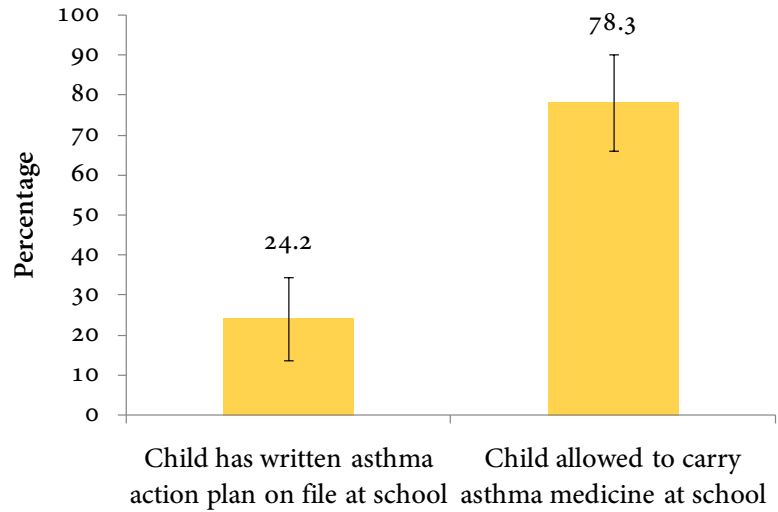
- Only 24.2% of parents of children with current asthma reported that their children had an asthma action plan on file at school.
- Just over three-fourths (78.3%) of parents of children with current asthma reported that their children were allowed to carry their asthma medication at school.
- Significantly higher percentages of high school-age students with current asthma reported being allowed to carry their asthma medications at school (93.2%), compared to elementary age students with current asthma (64.6%).

Asthma in Utah Schools

Figure 34. Asthma Action Plan and Medication at School, Utah School-aged Children with Current Asthma, 2010

The Utah Asthma Program encourages schools to keep a written asthma action plan on file for all students with current asthma. In 2010, only about one-quarter (24.2%) of parents of children with current asthma reported that their children had an asthma action plan on file at their school.

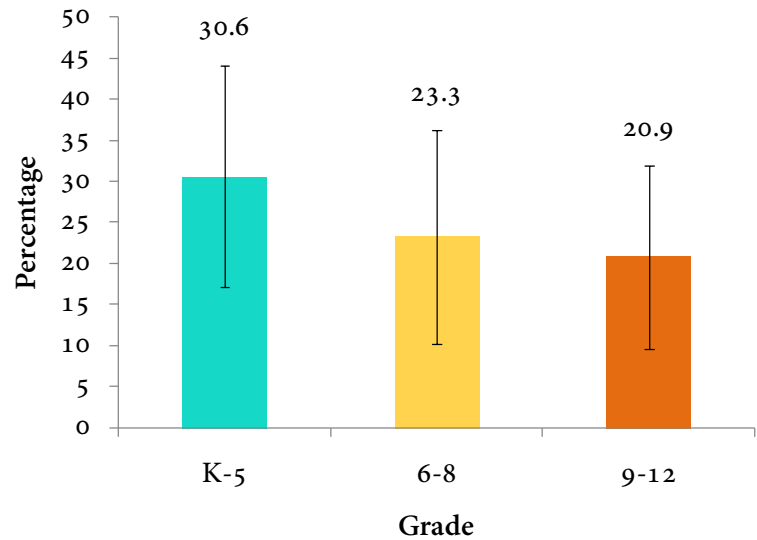
Utah law permits students with asthma to possess and self-administer inhaled asthma medications in the school setting. However, in 2010, only 78.3% of parents of children with asthma reported that their children were allowed to carry their asthma medications at school.



Source: Utah BRFSS Child Call-back Survey, 2010. Crude percentages are presented with 95% confidence intervals

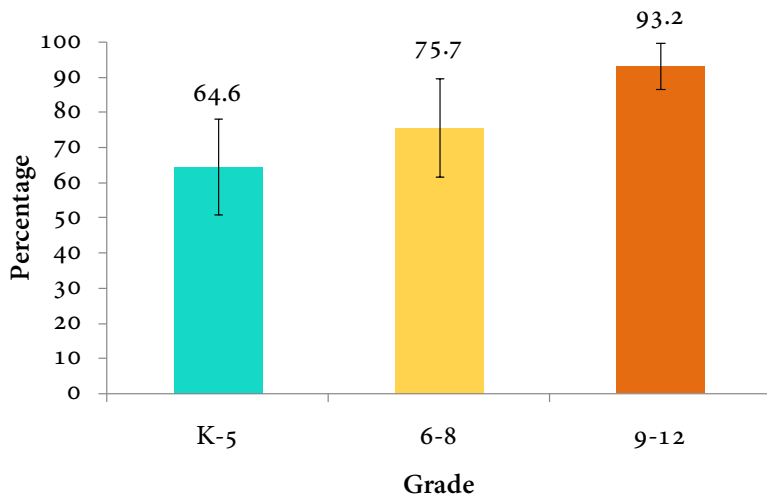
Figure 35. Children with Current Asthma Who have an Asthma Action Plan on File at School by School Grade, Utah, 2008-2010

The percentage of children who had an asthma action plan on file at school seemed to decrease with increasing grade level. However, differences were not statistically significant.



Source: Utah BRFSS Child Call-back Survey, 2008-2010 combined. Crude percentages are presented with 95% confidence intervals.

Asthma in Utah Schools



Source: BRFSS Child Call-back Survey, 2008-2010 combined. Crude percentages are presented with 95% confidence intervals

Figure 36. Children with Current Asthma Whose School Allows Them to Carry Their Asthma Medication at School by School Grade, Utah, 2008-2010

The percentage of children whose school allowed them to carry their asthma medication appeared to increase with increasing grade level. Significantly higher percentages of children in grades 9-12 were allowed to carry their asthma medications, compared to children in grades K-5.

Asthma in Utah Schools

Table 2. Asthma Management in Utah Public Schools, 2010

In 2010, school surveys were administered to determine what actions Utah public schools had implemented to help their schools be more asthma friendly.

Surveys found that 58.5% of elementary schools and 60.3% of secondary schools identify students with poorly controlled asthma by keeping track of them in at least three of the following ways:

- Frequent absences from school.
- Frequent visits to the school health office due to asthma.
- Frequent asthma symptoms at school.
- Frequent non-participation in physical education class due to asthma.
- Students sent home early due to asthma.
- Calls from school to 911 or other local emergency numbers due to asthma.

Additional results are included in Table 2.

School-Level Impact Measure	Elementary School Percentage (Grades K-5)	Secondary School Percentage (Grades 6-12)
Percentage of schools in which students' family and community members have helped develop or implement asthma management policies and programs.	11.1	9.9
Percentage of schools with an asthma action plan on file for all students with known asthma.	64.9	49.8
Percentage of schools that implement a policy permitting students to carry and self-administer asthma medications by designating an individual responsible for implementing the policy and communicating the policy to students, parents, and families.	51.5	45.3
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.	50.2	28.5
The percentage of schools that have a full-time registered school nurse on-site during school hours.	2.1	4.9
The percentage of schools that provide intensive case management for students with poorly-controlled asthma at school.	11.5	10.0

Source: Utah School Health Profiles Survey, 2010.

Note: Elementary school data include responses from school principals, while secondary school data include combined responses from both principals and teachers. Thus, elementary and secondary school responses may not be directly comparable.

Asthma Emergency Department Visits

Emergency department visits are an indicator of uncontrolled asthma. Asthma morbidity can be measured by the numbers of visits asthma sufferers make to the emergency department, and this is where the reality of the true burden of asthma can be seen in individuals whose condition is poorly controlled.

The Utah Department of Health maintains a database that contains emergency department visit data for nearly all emergency department facilities statewide. By tracking emergency department visits, the Utah Asthma Program is able to assess changes in asthma morbidity over time, and also use this measure to compare outcomes among various populations. These data are used to identify populations in most need and to target interventions specific to those populations.

Key Findings

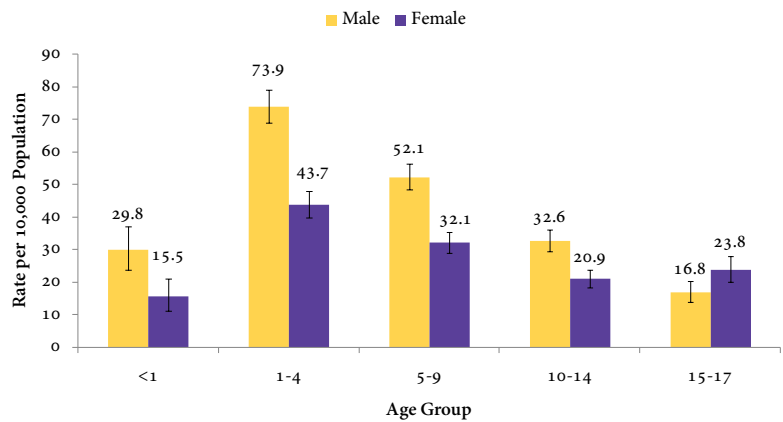
- Male children had significantly higher emergency department visit rates for asthma compared to female children for every age group younger than 15.
- For every adult age group, females had significantly higher emergency department visit rates for asthma compared to males.
- Utah emergency department visit rates for asthma were lower than Healthy People 2020 targets for every age group except 65+.



Asthma Emergency Department Visits

Figure 37. Asthma Emergency Department Visits by Age and Sex, Utah Children Ages 0-17, 2009

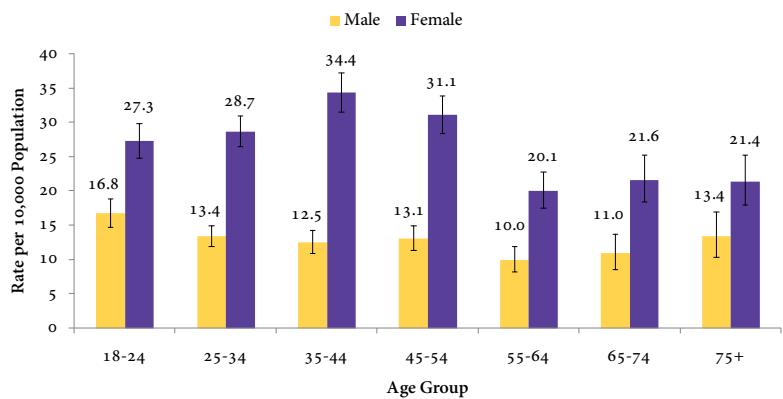
The highest rate of asthma emergency department visits for children was among males ages 1-4 (73.9 visits per 10,000 residents). For every age group except 15-17, males had a significantly higher rate of emergency department encounters for asthma compared to females.



Source: Utah Emergency Department Encounter Database, 2009. Crude rates are presented with 95% confidence intervals.
 Note: The primary diagnosis code ICD 493 was used to identify emergency department visits due to asthma. Data include patients who were treated and released and those who were admitted as inpatients.

Figure 38. Asthma Emergency Department Visits by Age and Sex, Utah Adults Ages 18 and Older, 2009

Among adults ages 18 and older, females experienced a significantly higher rate of emergency department visits for asthma compared to males for every age group. The rate of emergency department encounters was lowest among adults ages 55-64 for both males (10.0 encounters per 10,000 residents) and females (20.1 encounters per 10,000 residents).



Source: Utah Emergency Department Encounter Database, 2009. Crude rates are presented with 95% confidence intervals.
 Note: The primary diagnosis code ICD 493 was used to identify emergency department visits due to asthma. Data include patients who were treated and released and those who were admitted as inpatients.

Asthma Emergency Department Visits

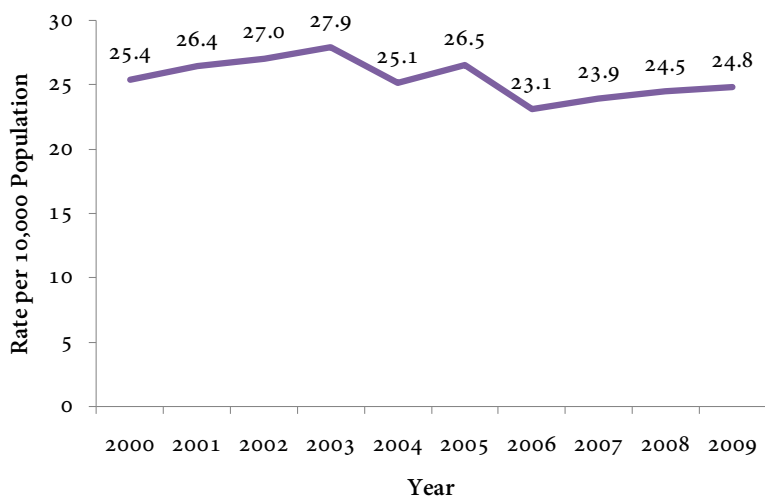


Figure 39. Asthma Emergency Department Visits, Utah Residents, 2000-2009

In recent years (2006-2009), the emergency department visit rate for asthma has increased slightly each year, but has remained lower than all previous years shown.

Source: Utah Emergency Department Encounter Database. 2000-2009 age-adjusted rates are presented.

Note: The primary diagnosis code ICD 493 was used to identify emergency department visits due to asthma. Data include patients who were treated and released and those who were admitted as inpatients.

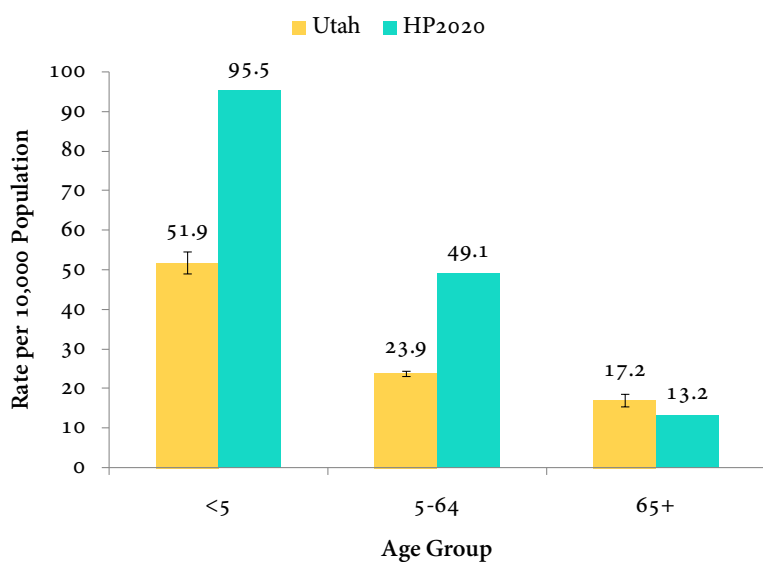


Figure 40. Utah Emergency Department Visits for Asthma Compared to Healthy People 2020 Targets, 2009

Utah emergency department visit rates for asthma are well below national Healthy People 2020 targets for age groups under 65. Among adults ages 65 and older, emergency department visit rates would need to fall by approximately 23% to meet the national target.

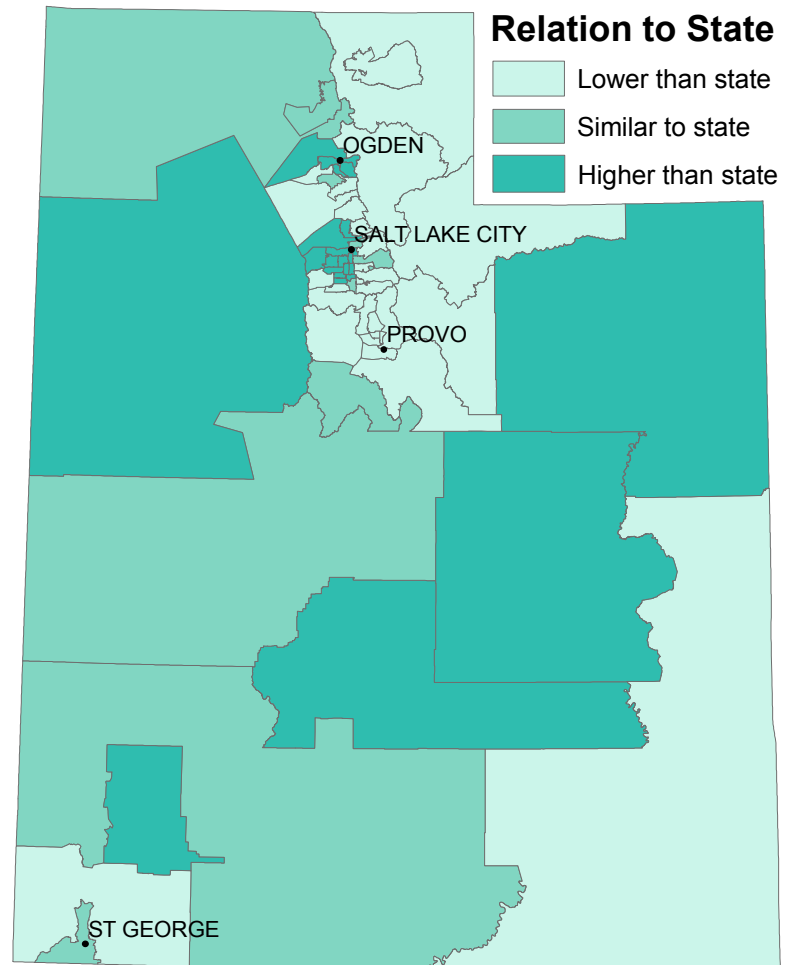
Source: Utah Emergency Department Encounter Database, 2009. Crude rates are presented. Utah rates are shown with 95% confidence intervals.

Note: The primary diagnosis code ICD 493 was used to identify emergency department visits due to asthma. Data include patients who were treated and released and those who were admitted as inpatients.

Asthma Emergency Department Visits

Figure 41. Asthma Emergency Department Visit Rates by Small Area, Utah Adults, 2005-2009

See Tables 3a & 3b on page 39.



Source: Utah Emergency Department Encounter Database, 2005-2009 combined. Age-adjusted rates are presented.

Note: The primary diagnosis code ICD 493 was used to identify emergency department visits due to asthma. Data include patients who were treated and released and those who were admitted as inpatients. Due to small area boundary changes that occurred in 2009, emergency department visit rates for the following small areas were calculated using data from 2009 only: W. Jordan Northeast, W. Jordan Southeast, and West Jordan West/Copperton.

Asthma Emergency Department Visits

Table 3a. Small Areas with Significantly Lower Asthma Emergency Department Visit Rates Compared to State, Utah 2005-2009

Area	Area Name	Age-adjusted Rate per 10,000 Population with 95% CI
	State	24.5 (24.3-24.8)
Lower than State		
Bear River	Logan	15.8 (14.4-17.3)
	Other Cache/Rich County	12.3 (10.8-14.0)
Davis	Bountiful	18.1 (16.4-19.8)
	Farmington/Centerville	13.7 (11.9-15.8)
	Layton	16.4 (15.1-17.9)
	Syracuse/Kaysville	14.8 (13.2-16.5)
Salt Lake	Cottonwood	17.8 (16.0-19.7)
	Foothill/U of U	19.1 (16.6-21.9)
	Holladay	21.5 (19.6-23.5)
	NE Sandy	15.6 (13.1-18.3)
	Riverton/Draper	18.4 (16.9-19.9)
	SE Sandy	11.9 (10.1-13.9)
	South Jordan	17.2 (15.3-19.4)
Southeast	Grand/San Juan Counties	17.9 (15.6-20.5)
Southwest	Other Washington County	20.7 (19.1-22.4)
Summit	Summit County	9.7 (8.3-11.2)
Utah County	American Fork/Alpine	11.0 (9.8-12.4)
	East Orem	13.9 (11.8-16.2)
	Lehi/Cedar Valley	21.4 (19.4-23.5)
	North Orem	21.0 (18.9-23.2)
	Pleasant Grove/Lindon	13.6 (12.0-15.4)
	Provo/BYU	8.5 (7.2-9.9)
	Provo South	21.1 (19.1-23.2)
	Springville/Spanish Fork	15.7 (14.4-17.1)
	West Orem	14.3 (12.4-16.4)
Wasatch	Wasatch County	12.0 (10.0-14.3)
Weber-Morgan	Morgan/East Weber County	13.1 (11.5-14.9)
	Roy/Hooper	21.3 (19.4-23.4)

Table 3b. Small Areas with Significantly Higher Asthma Emergency Department Visit Rates Compared to State, Utah 2005-2009

Area	Area Name	Age-adjusted Rate per 10,000 Population with 95% CI
	State	24.5 (24.3-24.8)
Higher than State		
Central	Sevier/Piute/Wayne Counties	43.8 (40.2-47.7)
Salt Lake	Downtown Salt Lake	36.5 (34.1-39.0)
	Glendale	58.0 (54.1-62.0)
	Kearns	37.7 (35.6-40.0)
	Magna	39.2 (35.8-42.8)
	Midvale	36.8 (33.8-40.0)
	Murray	38.7 (35.7-41.9)
	Riverdale	31.5 (28.4-35.0)
	Rose Park	43.1 (40.1-46.2)
	South Salt Lake	53.7 (49.7-57.9)
	Taylorsville	33.5 (31.0-36.2)
	W. Jordan Northeast	36.4 (30.5-43.0)
	W. Jordan Southeast	32.4 (26.6-39.1)
	W. Jordan West, Copperton	14.7 (9.8-21.1)
	West Valley East	45.1 (42.6-47.7)
	West Valley West	36.5 (34.4-38.6)
	Woods Cross/North Salt Lake	29.2 (26.2-32.5)
Southeast	Carbon/Emery Counties	37.0 (33.8-40.4)
Southwest	Cedar City	27.9 (25.5-30.6)
Tooele	Tooele Co.	37.5 (35.3-39.9)
TriCounty	TriCounty	56.5 (53.4-59.7)
Weber-Morgan	Ben Lomond	31.1 (28.9-33.3)
	Downtown Ogden	40.2 (37.3-43.3)
	South Ogden	32.0 (29.4-34.7)

Asthma Hospitalizations

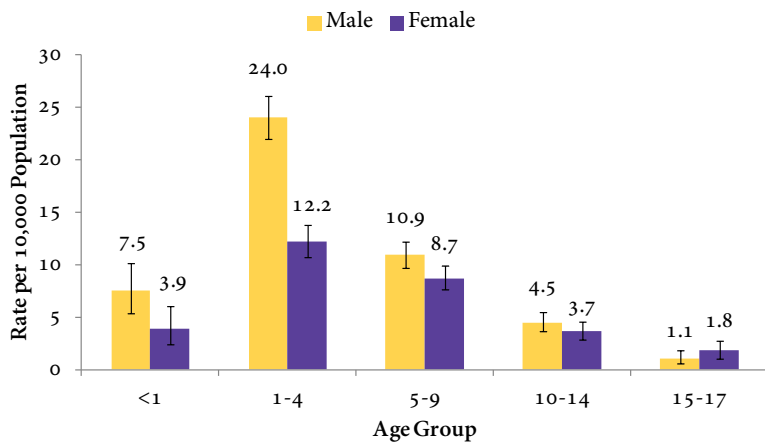


Severe or uncontrolled asthma can result in hospitalization. Asthma morbidity can be measured by the numbers of hospitalizations, which are gathered statewide and maintained in the Utah Hospital Discharge Database. The Utah Asthma Program uses these data to assess changes in asthma morbidity over time, and to identify populations with the poorest asthma outcomes. These data help to give a picture of the asthma burden in Utah and are used to target interventions appropriately.

Key Findings

- Male children ages 1-4 had the highest rate of asthma hospitalizations (24.0 visits per 10,000 population) compared to females and other age groups.
- Among adults, asthma hospitalization rates generally increased with increasing age, with the highest hospitalization rate among female adults ages 75+ (12.7 visits per 10,000 population).
- Utah asthma hospitalization rates were lower than Healthy People 2020 targets for every age group.

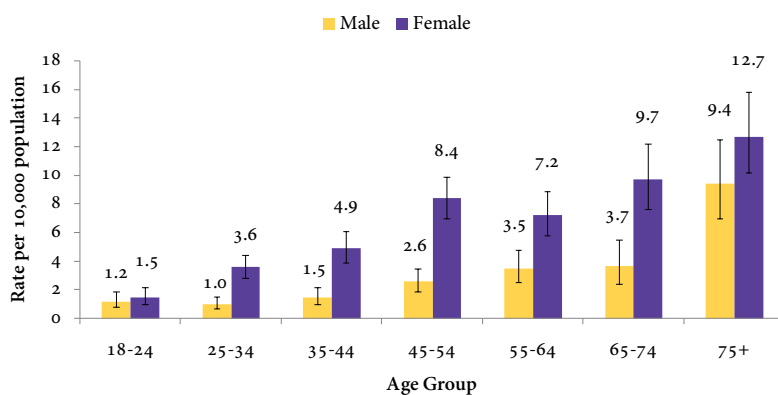
Asthma Hospitalizations



Source: Utah Hospital Discharge Database, 2009-2010 combined. Crude rates are presented with 95% confidence intervals.
 Note: The primary diagnosis code ICD 493 was used to identify hospitalizations due to asthma.

Figure 42. Asthma Hospitalizations by Age and Sex, Utah Children Ages 0-17, 2009-2010

Among children, males and females ages 1-4 had the highest rates of hospitalization due to asthma (24.0 and 12.2 visits per 10,000 population, respectively). For every group except ages 15-17, males had a higher asthma hospitalization rate compared to females. Differences were statistically significant only for the age group 1-4.



Source: Utah Hospital Discharge Database, 2010. Crude rates are presented with 95% confidence intervals.
 Note: The primary diagnosis code ICD 493 was used to identify hospitalizations due to asthma.

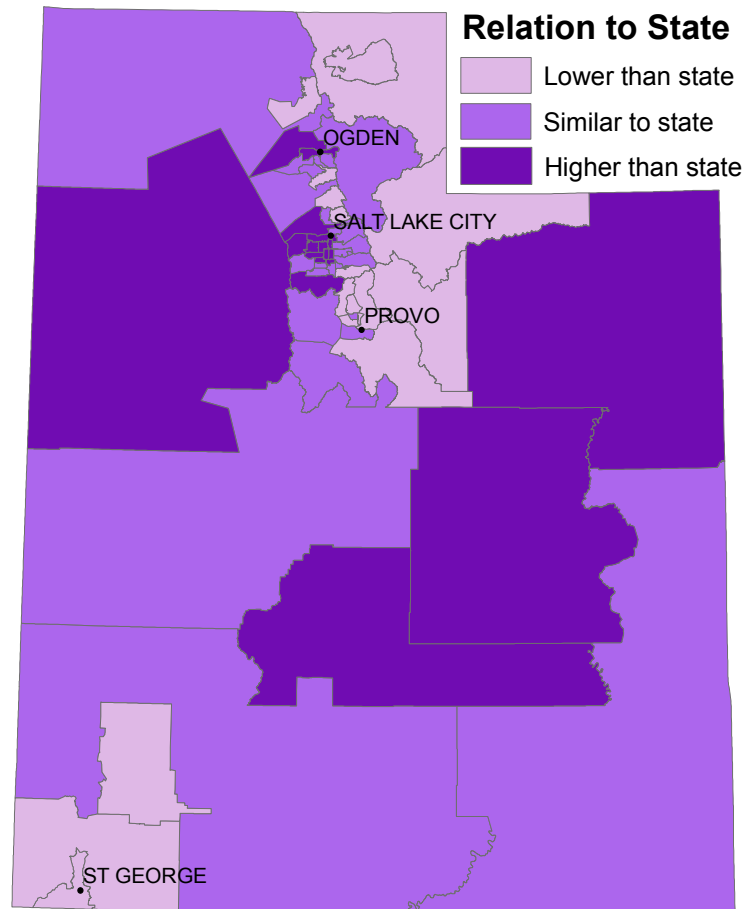
Figure 43. Asthma Hospitalizations by Age and Sex, Utah Adults Ages 18 and Older, 2010

Female adults had a higher rate of hospitalization due to asthma compared to adult males for every age group (differences were not statistically significant for age groups 18-24 and 75+). The highest rates of hospitalization for both male and female adults were among those ages 75 years and older (9.4 and 12.7 hospitalizations per 10,000 residents, respectively).

Asthma Hospitalizations

Figure 44. Asthma Hospitalization Rate by Small Area, Utah Adults, 2006-2010

See Tables 4a & 4b on page 43.



Source: Utah Hospital Discharge Database, 2006-2010 combined. Age-adjusted rates are presented.

Note: The primary diagnosis code ICD 493 was used to identify hospitalizations due to asthma. Due to small area boundary changes that occurred in 2009, prevalence for the following small areas was calculated using only data from 2009-2010: W. Jordan Northeast, W. Jordan Southeast, and West Jordan West/Copperton.

Asthma Hospitalizations

Table 4a. Small Areas with Significantly Lower Asthma Hospitalization Rates Compared to State, Utah 2006-2010

Area	Area Name	Age-adjusted Rate per 10,000 Population with 95% CI*
	State	5.2 (5.1-5.3)
Lower than State		
Bear River	Brigham City	3.0 (2.0-4.2)
	Logan	3.5 (2.8-4.2)
	Other Cache/Rich County	2.9 (2.2-3.8)
Davis	Bountiful	3.9 (3.2-4.8)
	Farmington/Centerville	3.1 (2.2-4.1)
	Layton	3.8 (3.2-4.5)
Salt Lake	SE Sandy	3.2 (2.2-4.5)
Southwest	Cedar City	3.1 (2.3-4.1)
	Other Washington County	3.2 (2.6-3.8)
	St. George	2.5 (2.1-3.1)
Summit	Summit County	2.7 (2.0-3.5)
Utah County	American Fork/Alpine	2.6 (1.9-3.3)
	East Orem	3.6 (2.6-4.9)
	Pleasant Grove/Lindon	3.6 (2.8-4.6)
	Provo/BYU	1.4 (0.9-2.0)
	Springville/Spanish Fork	3.3 (2.7-3.9)
	West Orem	2.6 (1.8-3.6)
Wasatch	Wasatch County	1.4 (0.8-2.2)

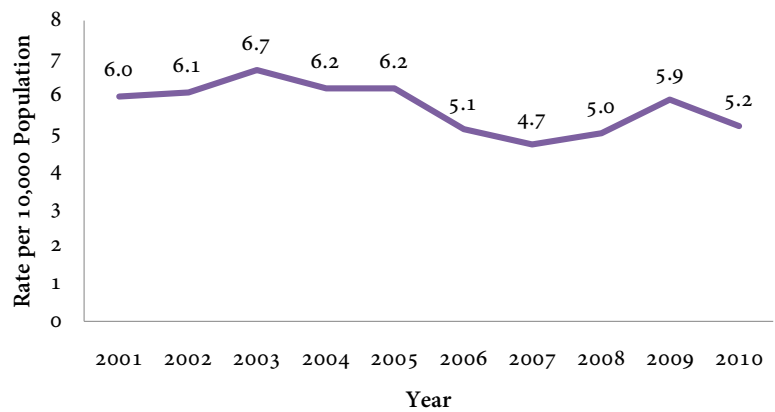
Table 4b. Small Areas with Significantly Higher Asthma Hospitalization Rates Compared to State, Utah 2006-2010

Area	Area Name	Age-adjusted Rate per 10,000 Population with 95% CI*
	State	5.2 (5.1-5.3)
Higher than State		
Central	Sevier/Piute/Wayne Counties	8.8 (7.2-10.6)
Salt Lake	Downtown Salt Lake	7.0 (5.9-8.1)
	Glendale	12.1 (10.2-14.2)
	Kearns	9.2 (8.1-10.5)
	Magna	7.5 (6.1-9.1)
	Midvale	7.5 (6.1-9.0)
	Murray	7.9 (6.6-9.4)
	Riverton/Draper	6.5 (5.5-7.5)
	Rose Park	9.4 (8.0-11.0)
	South Salt Lake	9.1 (7.5-11.0)
	Taylorsville	7.4 (6.2-8.8)
	W. Jordan Northeast	12.0 (9.4-15.2)
	West Valley West	9.1 (8.0-10.4)
	West Valley East	9.8 (8.6-11.1)
Southeast	Carbon/Emery Counties	7.4 (6.1-8.9)
Tooele	Tooele Co.	8.6 (7.6-9.8)
TriCounty	TriCounty	9.6 (8.4-11.0)
Weber-Morgan	Ben Lomond	6.7 (5.8-7.8)
	Downtown Ogden	7.2 (5.9-8.6)

Asthma Hospitalizations

Figure 45. Asthma Hospitalizations, Utah Residents, 2001-2010

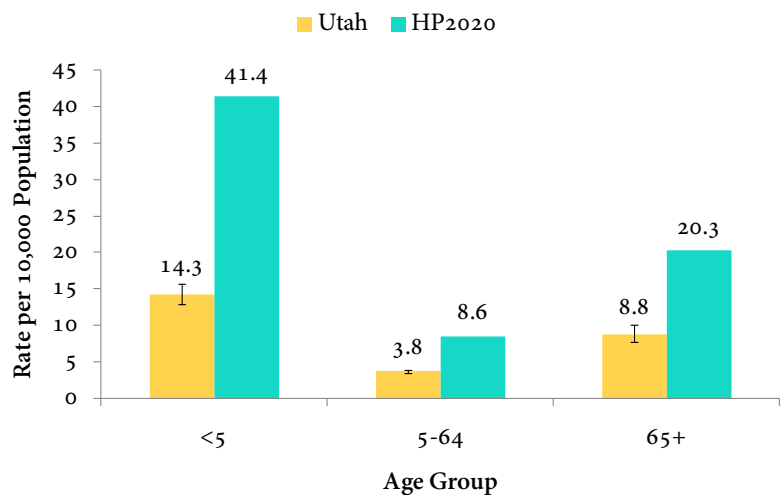
In recent years (2006-2010), Utah asthma hospitalization rates fluctuated but remained lower than all previous years since 2001.



Source: Utah Hospital Discharge Database, 2001-2010. Age-adjusted rates are presented.
 Note: The primary diagnosis code ICD 493 was used to identify hospitalizations due to asthma.

Figure 46. Utah Asthma Hospitalizations Compared to Healthy People 2020 Targets, 2010

In 2010, Utah asthma hospitalization rates were well below national Healthy People 2020 targets for every age group.



Source: Utah Hospital Discharge Database, 2010. Crude rates are presented. Utah rates are shown with 95% confidence intervals.
 Note: The primary diagnosis code ICD 493 was used to identify hospitalizations due to asthma.

Costs of Asthma Care

Costs of care are an indicator of the burden of asthma on families, the health care system, and the community. Charges for asthma care are maintained in the Utah Hospital Discharge and Emergency Department Encounter databases. These data show that charges for asthma care in the emergency department and hospital setting have been rising substantially over the past decade. By improving asthma management, individuals with asthma can prevent these types of visits and substantially reduce the costs of asthma care.

Key Findings

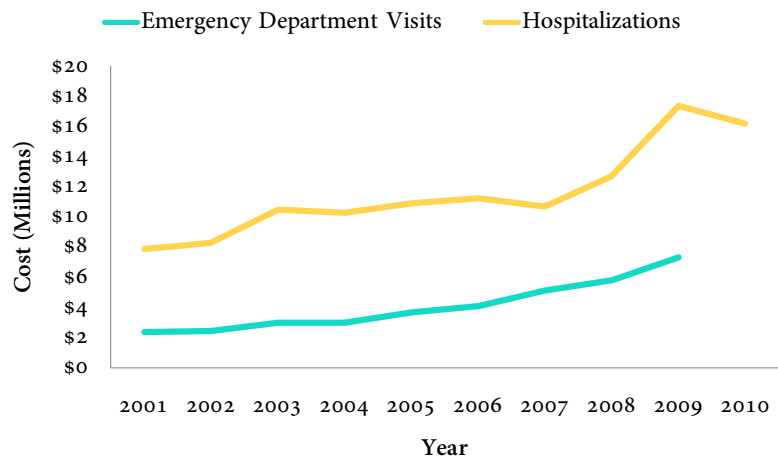
- From 2001 to 2010, total charges for asthma hospitalizations in Utah more than doubled (from \$7.9 to \$16.2 million).
- Asthma emergency department charges more than tripled from 2001 to 2009 (from \$2.4 to \$7.3 million).



Costs of Asthma Care

Figure 47. Total Charges for Asthma-related Hospitalizations and Emergency Department Visits by Year, Utah, 2001-2010

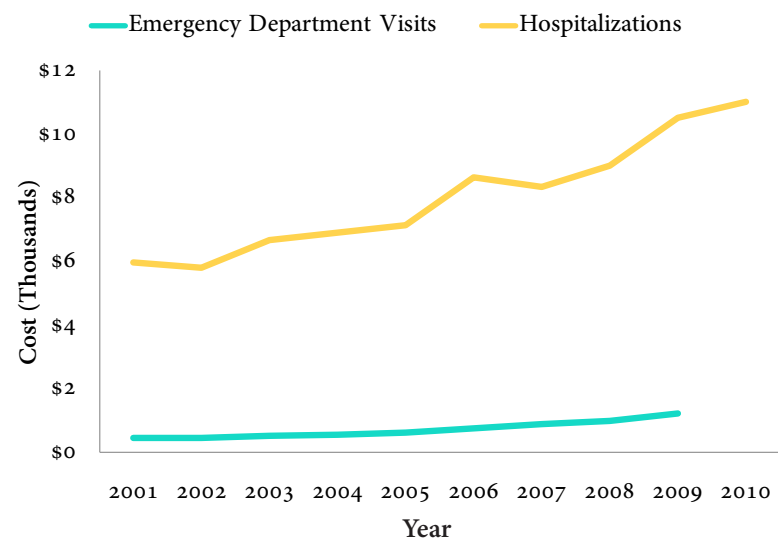
Total asthma-related hospitalization and emergency department visit charges increased every year during 2001-2010. Annual hospitalization charges for asthma more than doubled during that time (from \$7.9 to \$16.2 million). Emergency department charges more than tripled from 2001 to 2009 (from \$2.4 to \$7.3 million).



Source: Utah Hospital Discharge Database and Utah Emergency Department Encounter Database, 2001-2010. The primary diagnosis code ICD 493 was used to identify hospitalization and emergency department visit charges specific to asthma. Emergency department charges shown include those generated from treat-and-release encounters only.

Figure 48. Average Charge per Asthma-related Hospitalization and Emergency Department Visit by Year, Utah, 2001-2010

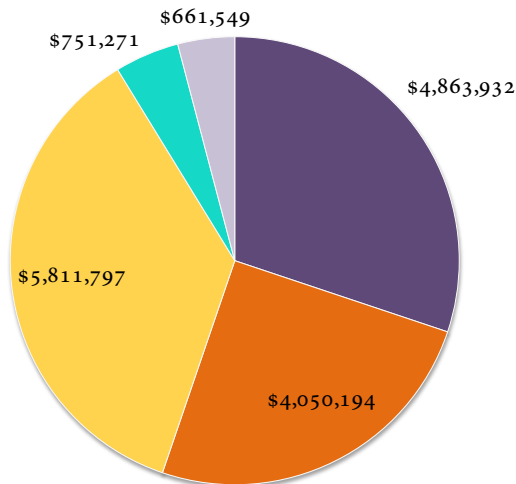
The average charge per asthma-related hospitalization or emergency department visit increased every year during 2001-2010. The average charge per hospitalization nearly doubled during that time period (from \$5,979 to \$11,010 per visit). Between 2001 and 2009, the average charge per emergency department visit nearly tripled (from \$449 to \$1,225 per visit).



Source: Utah Hospital Discharge Database and Utah Emergency Department Encounter Database, 2001-2010. The primary diagnosis code ICD 493 was used to identify hospitalization and emergency department visit charges specific to asthma. Emergency department charges shown include those generated from treat-and-release encounters only.

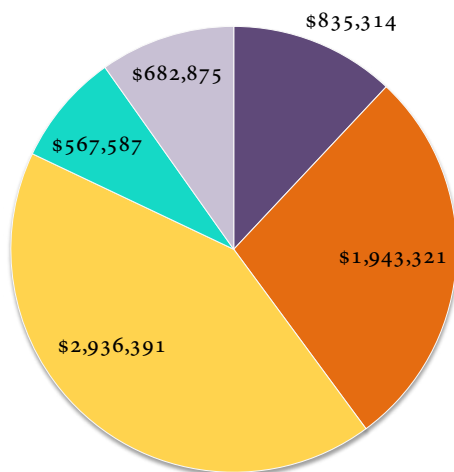
Costs of Asthma Care

■ Medicare ■ Medicaid ■ Commercial health insurance ■ Self-pay ■ Other



Source: Utah Hospital Discharge Database, 2010. The primary diagnosis code ICD 493 was used to identify hospitalization charges specific to asthma. Other includes: other government besides Medicaid and Medicare, charity/unclassified, Industrial & Worker's Compensation, and CHIP.

■ Medicare ■ Medicaid ■ Commercial health insurance ■ Self-pay ■ Other



Source: Emergency Department Encounter Database, 2009. The primary diagnosis code ICD 493 was used to identify emergency department charges specific to asthma. Emergency department charges shown include those generated from treat-and-release encounters only. Other includes: other government besides Medicaid and Medicare, charity/unclassified, Industrial & Worker's Compensation, and CHIP.

Figure 49. Asthma Hospitalization Charges by Primary Source of Payment, Utah, 2010

In 2010, the majority of asthma hospitalization charges were billed to Medicaid or Medicare, followed by commercial or managed care plans.

Figure 50. Asthma-related Emergency Department Visit Charges by Primary Source of Payment, Utah, 2009

In 2009, the majority of charges for asthma-related emergency department visits were billed to commercial or managed care plans, followed by Medicaid.

Asthma Mortality

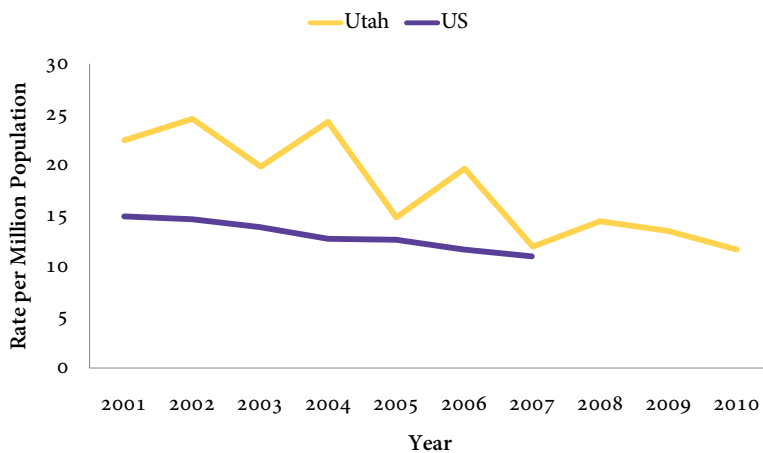


Asthma-related deaths are rare and occur most commonly among the elderly population. During the 10-year period 2001-2010, asthma was listed as the primary cause of death for 327 individuals in Utah; more than half of those deaths (54.1%) occurred among individuals ages 75 and older. Asthma mortality has been following a decreasing trend both state- and nationwide over the past decade.

Key Findings:

- In Utah and the United States, the asthma mortality rate appears to have followed a decreasing trend for the years 2001-2010.
- From 2006-2010, the asthma mortality rate among elderly adults ages 75 and older (135.9 deaths per million Utah residents) was more than five times greater than the asthma mortality rate for any other age group.
- For most years from 2001-2010, females suffered a higher asthma mortality rate compared to males.
- From 2006-2010, the Utah asthma mortality rate for elderly adults ages 65 and older (76.3 deaths per million population) was more than triple the national Healthy People 2020 target for that age group (22.9 deaths per million population).

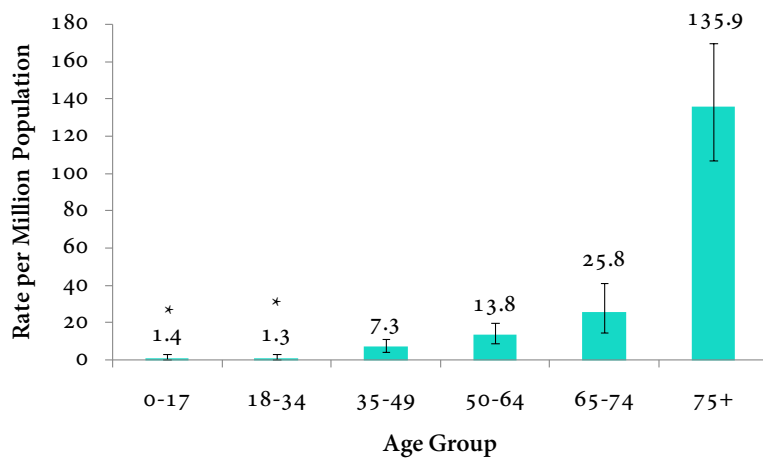
Asthma Mortality



Source: Utah Death Certificate Database, 2001-2010. Centers for Disease Control and Prevention, National Center for Health Statistics. Compressed Mortality File 1999-2007. Age-adjusted rates are presented.
 Note: ICD-10 codes J45 and J46 were used to identify asthma as the primary cause of death.

Figure 51. Asthma Mortality Rate by Year, Utah Compared to the United States, 2001-2010

Overall, the asthma mortality rate has followed a decreasing trend over the past 10 years. In 2010, the Utah asthma mortality rate was 48% lower than the rate in 2001 (11.7 versus 22.5 deaths per million Utah residents, respectively).



Source: Utah Death Certificate Database, 2006-2010 combined. Crude rates are presented with 95% confidence intervals. *The estimate has a coefficient of variation >30% and does not meet Utah Department of Health standards for reliability.
 Note: ICD-10 codes J45 and J46 were used to identify asthma as the primary cause of death.

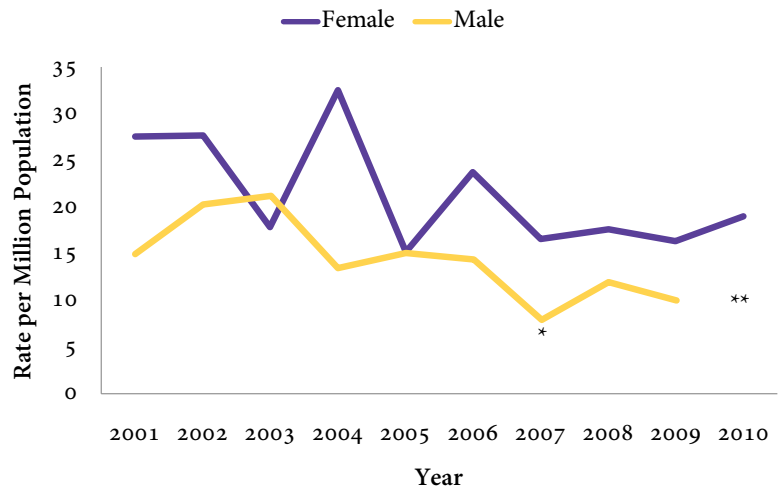
Figure 52. Asthma Mortality Rate by Age Group, Utah, 2006-2010

From 2006-2010, the asthma mortality rate among elderly adults ages 75 and older (135.9 deaths per million Utah residents) was more than five times greater than the asthma mortality rate for any other age group. The asthma mortality rate appears to increase with advancing age.

Asthma Mortality

Figure 53. Asthma Mortality Rate by Year and Sex, 2001-2010

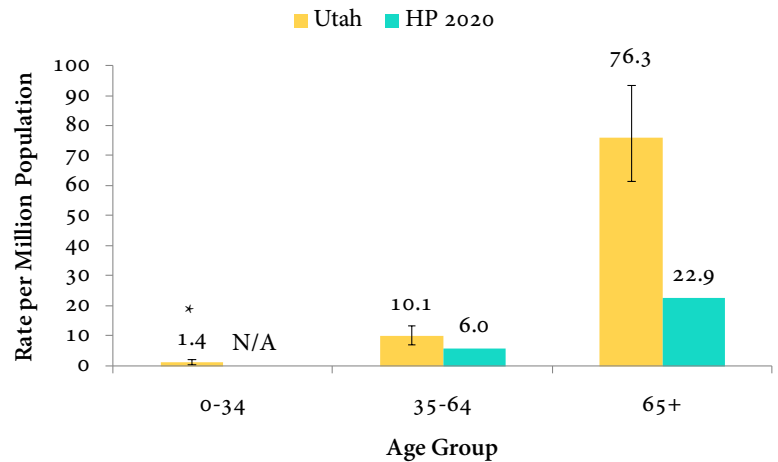
For most years from 2001-2010, females maintained a higher asthma mortality rate compared to males. Overall, the asthma mortality rate appears to have been following a decreasing trend during the past 10 years among both males and females.



Source: Utah Death Certificate Database, 2001-2010. Age-adjusted rates are presented.
 *The estimate for males in 2007 has a coefficient of variation >30% and does not meet Utah Department of Health standards for reliability.
 ** The estimate has a coefficient of variation >50% and is not appropriate for publication.
 Note: ICD-10 codes J45 and J46 were used to identify asthma as the primary cause of death.

Figure 54. Utah Asthma Mortality Rates Compared to Healthy People 2020 Targets, 2006-2010

From 2006-2010, Utah asthma mortality rates for ages 35-64 and 65 and older exceeded national Healthy People 2020 targets. The asthma mortality rate among elderly adults must decrease by nearly 70% to meet the national target.



Source: Utah Death Certificate Database, 2006-2010 combined. Crude rates are presented. Utah rates are shown with 95% confidence intervals.
 *The estimate has a coefficient of variation >30% and does not meet Utah Department of Health standards for reliability.
 Note: ICD-10 codes J45 and J46 were used to identify asthma as the primary cause of death.

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APPENDICES

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 landline 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. 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, and health services utilization.

Respondents from the BRFSS Core who report that they or their child has asthma are randomly selected to be called again to answer additional questions, known as the BRFSS Asthma Call-back Survey. The call-back survey contains approximately 100 asthma-specific questions and provides information on symptoms, medication use, number of asthma attacks, asthma education, environmental triggers, and missed school and work days. 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 (HDDB). 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 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 HDDB 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.

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 Utah Department of Health 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.

Appendix A Data Sources

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.

Two questionnaires are used to collect data—one for school principals and one for lead health education teachers. 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. Because the response rates for these surveys were $\geq 70\%$, the results are weighted and are representative of all regular public elementary and secondary schools in Utah.

Appendix B

Technical Notes and Methodology

Report Terminology

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.

Appendix B

Technical Notes and Methodology

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).

Figures 6 and 7 were age-adjusted using 3 age groups. Figures 4, 8, 9, and 10 and Table 1 were age-adjusted using 8 age groups. Figures 51 and 53 were age-adjusted using 11 age groups.

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.

Appendix B

Technical Notes and Methodology

Prevalence

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.

Appendix B

Technical Notes and Methodology

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.

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.



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Utah Asthma Program