ASTHMA FACTS

CDC's National Asthma Control Program Grantees

July 2013

National Facts on Asthma

- **An estimated 39.5 million people (12.9%), including 10.5 million (14.0%) children in the Unites States had been diagnosed with asthma in their lifetimes.**
- **Of the 39.5 million, 18.9 million (8.2%) adults and 7.1 million (9.5%) children still have asthma.**

National Health Interview Survey 2011[1]

National Public Health Impact of Asthma

- **The estimated total cost of asthma to society, including medical expenses ($50.1 billion per year), loss of productivity resulting from missed school or work days ($3.8 billion per year), and premature death ($2.1 billion per year), was $56 billion (2009 dollars) in 2007.[2]**
- **During 2001–2011, the number of persons with asthma in the United States increased by 28%.[1,3]**
- **In 2008, children aged 5–17 years who had one or more asthma attacks in the previous 12 months missed 10.5 million days of school. Adults who were employed and had one or more asthma attacks during the previous 12 months missed 14.2 million days of work due to asthma.[4]**
- **In 2010, asthma accounted for 3,404 deaths, 439,400 hospitalizations, 1.8 million emergency department (ED) visits, and 14.2 million physician office visits.**

CITATION

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ASTHMA FACTS – *CDC's National Asthma Control Program Grantees*

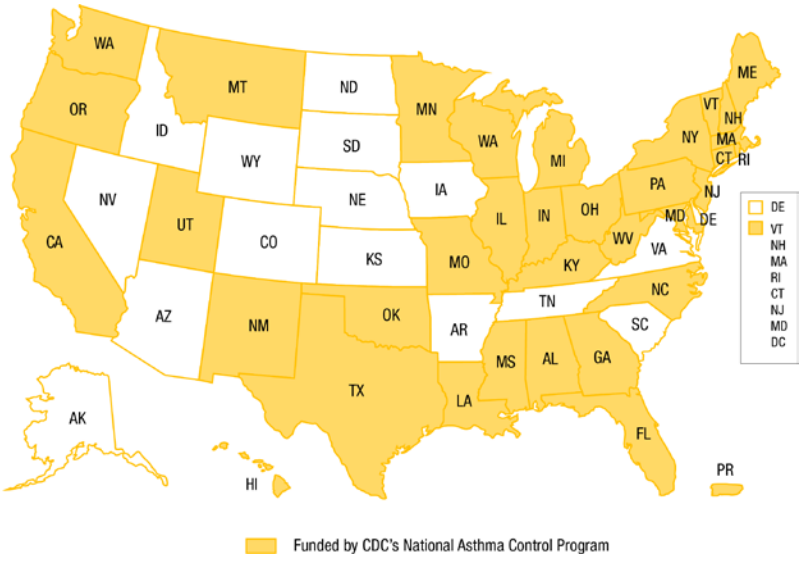
Introduction

What Is Asthma?

Asthma is a common chronic disorder of the airways characterized by periods of reversible airflow obstruction known as asthma episodes or attacks.[4,5] Asthma attacks are caused by chronically hyperactive (contraction of the muscles surrounding the airways) and inflamed airways, leading to airflow obstruction.[5] Common symptoms during an asthma attack include wheezing, coughing, shortness of breath, and chest tightness or pain.[5] Asthma attacks may be mild, moderate, or severe enough to become life-threatening events.[5] In most cases, the cause(s) of asthma is unknown. Multiple host and environmental factors may be involved in the development of asthma and exacerbation of asthma symptoms. Exposures associated with asthma attacks include exercise, airway infections, airborne allergens (e.g., pollen, mold, animal dander, dust mites), occupational exposures, and air pollution (e.g., environmental tobacco smoke, particulate matter, and volatile organic compounds).[5,6] Although there is no cure, asthma can be controlled with appropriate medical care, and asthma exacerbations can be prevented by avoiding exposures, particularly environmental exposures, that may trigger an attack.[5]

How Is CDC Addressing This Public Health Problem?

National Asthma Control Program: Currently Funded Grantees



The Centers for Disease Control and Prevention (CDC) created the National Asthma Control Program in 1999 to launch a public health response to control asthma. The CDC National Asthma Control Program aims to reduce the number of deaths, hospitalizations, emergency department visits, school or work days missed, limitations on activities due to asthma, and to increase the number of people receiving asthma management education and appropriate care. The program supports the *Healthy People* goals and objectives for asthma by implementing evidence-based interventions that reduce asthma-related morbidity and mortality and by continually enhancing surveillance systems to monitor progress. During Fiscal Year 2009, CDC funded grantees in 34 states, the District of Columbia, and Puerto Rico for five years to help CDC meet these goals and objectives.

About This Report

Asthma Facts – CDC's National Asthma Control Program Grantees is a report produced by the CDC National Asthma Control Program (NACP) that describes asthma prevalence, healthcare utilization, asthma self-management education, and mortality for the program's funded grantees in 34 states, the District of Columbia, and Puerto Rico. This report uses data from CDC surveys (Behavioral Risk Factor Surveillance System, Asthma Call-back Survey, and National Vital Statistics System). Adult and child current asthma prevalence estimates are presented by demographic characteristics and behavior risk factors. The term *current asthma prevalence* refers to the number and percent of the population who were reported to have asthma at a given point in time. Although adult asthma prevalence data are available for all the 36 NACP grantees,[*] child asthma prevalence data are available for only 32 grantees.[†] Asthma healthcare utilization and health outcome measures are presented by age and race/ethnicity for adults (33 grantees[‡]) and children (16 grantees[§]). Race and ethnicity groups are categorized as non-Hispanic white, non-Hispanic black, non-Hispanic multi-race, non-Hispanic other, and Hispanic. For purposes of this report, we will refer to these groups as white, black, multi-race, other, and Hispanic. Asthma deaths from 1999–2010 are presented as number of deaths and rates in cases in which asthma was listed as the underlying cause of death by 35 NACP grantees (excludes Puerto Rico).

KEY FINDINGS

Current asthma prevalence is highest among adults aged 18-24 years, adult females, and multi-race and black adults.

Among children, current asthma prevalence is lowest among persons aged 0-4 years and highest among males, black and multi-race persons.

Healthcare utilization among children and adults differed by race/ethnicity.

Routine office visits, emergency department visits, and urgent care visits for asthma were higher among children compared with adults.

Overall, children were more likely than adults to receive asthma self-management education.

Older adults, women and blacks were more likely to die due to asthma.

[*] Adult Current Asthma Prevalence — NACP Participating Grantees (36): Alabama, California, Connecticut, District of Columbia, Florida, Georgia, Hawaii, , Illinois, Indiana, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, New Hampshire, New Jersey, New Mexico, New York, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, Puerto Rico, Rhode Island, Texas, Utah, Vermont, Washington, West Virginia, Wisconsin

[†] Child Current Asthma Prevalence — NACP Participating Grantees (32): Alabama, California, Connecticut, District of Columbia, Georgia, Hawaii, Illinois, Indiana, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Mississippi, Missouri, Montana, New Jersey, New Mexico, New York, Ohio, Oklahoma, Oregon, Pennsylvania, Puerto Rico, Rhode Island, Texas, Utah, Vermont, Washington, West Virginia, Wisconsin

[‡] Adult Healthcare Utilization and Health Outcomes — NACP Participating Grantees (33): Alabama, California, Connecticut, District of Columbia, Florida, Georgia, Hawaii, Illinois, Indiana, Louisiana, Maine, Maryland, Massachusetts, Michigan, Mississippi, Missouri, Montana, New Hampshire, New Jersey, New Mexico, New York, Ohio, Oklahoma, Oregon, Pennsylvania, Puerto Rico, Rhode Island, Texas, Utah, Vermont, Washington, West Virginia, Wisconsin

[§] Child Healthcare Utilization and Health Outcomes — NACP Participating Grantees (16): Connecticut, Georgia, Hawaii, Indiana, Maryland, Michigan, Mississippi, Montana, New Jersey, New Mexico, Oklahoma, Pennsylvania, Texas, Utah, Vermont, Washington

List of Figures

Current Asthma Prevalence

In 2010, there were 17.2 million (8.7%) adults with asthma and 4.6 million (8.5%) children with asthma living in NACP grantee states, the District of Columbia, and Puerto Rico. Current asthma prevalence among adults ranged from 6.7% in Louisiana to 11.1% in Vermont; among children, the prevalence ranged from 5.9% in California to 18% in the District of Columbia. Differences in current asthma prevalence exist between certain population subgroups.

Adults

Age

Current asthma prevalence was higher among adults aged 18–24 years (10.3%) compared with adults aged 25-34 years (8.7%), 35-44 years (8.1%), 45–54 years (8.5%), 55-64 years (9.4%), and 65 years and older (8.1%).

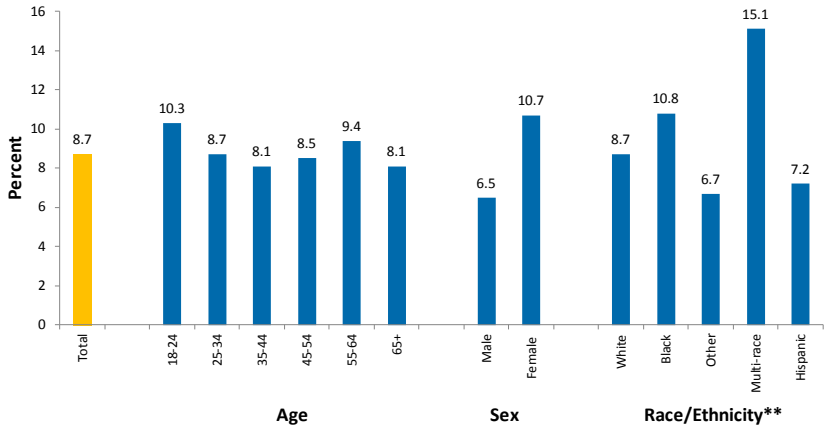
Sex

Current asthma prevalence was higher among females (10.7%) compared with males (6.5%).

Race and Ethnicity

When compared with white adults (8.7%), multi-race (15.1 %), and black (10.8%) adults had the higher current asthma prevalence.

Figure 1. Adult current asthma prevalence percent by age, sex, and race/ethnicity: National Asthma Control Program Grantees,* 2010



Source: Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention
* 36 National Asthma Control Program Grantees
** White, black, other, and multi-race categories are non-Hispanic

Children

Age

Current asthma prevalence was lower among children aged 0–4 years (6.3%) compared with children aged 5-9 years (10.0%), 10–14 years (9.4%), and 15–17 years (9.0%).

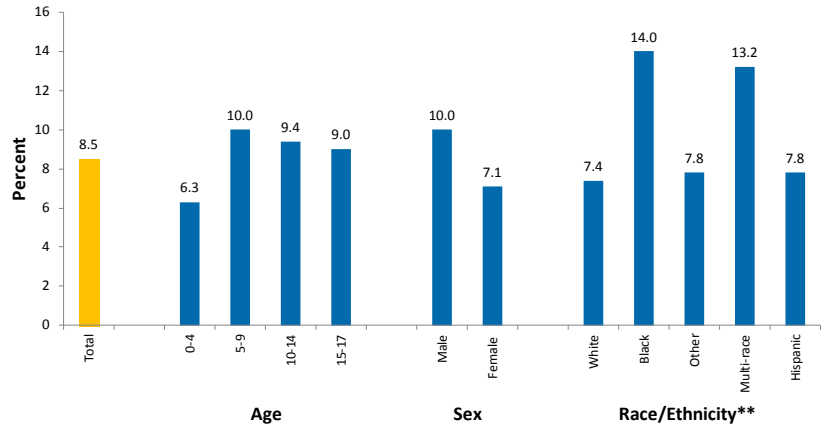
Sex

Current asthma prevalence was higher among males (10.0%) compared with females (7.1%).

Race and Ethnicity

Current asthma prevalence was higher among black (14.0%) and multi-race (13.2%) children compared with white children (7.4%).

Figure 2. Child current asthma prevalence percent by age, sex, and race/ethnicity: National Asthma Control Program Grantees,* 2010



Source: Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention
* 32 National Asthma Control Program Grantees
** White, black, other, and multi-race categories are non-Hispanic

Adult Education

Current asthma prevalence was higher among adults who did not graduate from high school (10.0%) compared with high school (8.8%) or college graduates (7.5%).

Household Income

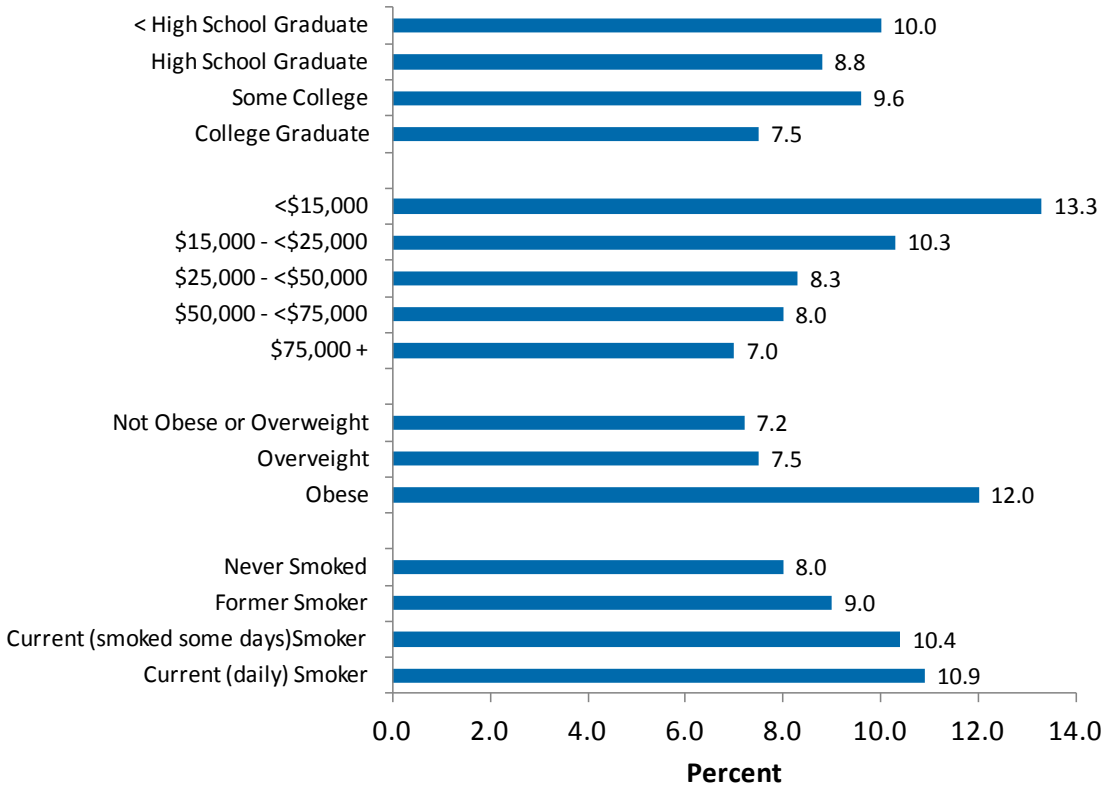
Current asthma was more prevalent among adults who lived in households with an income less than $15,000 (13.3%), $15,000 to less than $25,000 (10.3%), $25,000 to less than $50,000 (8.3%), and $50,000 to less than $75,000 (8.0%) compared with adults who lived in households with an income of $75,000 or more (7.0%).

Adult Behavioral Risk Factors

Current asthma prevalence was higher among obese adults (12.0%) compared with not obese or overweight adults (7.2%) and overweight adults (7.5%).

Current asthma was more prevalent among current-daily (10.9%) and current-smoked some days (10.4%) smokers compared with never (9.0%) and former (8.0%) smokers.

Figure 3. Adult current asthma prevalence percent by education, income, and behavioral risk factors: National Asthma Control Program Grantees,* 2010



Source: Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention
*36 National Asthma Control Program Grantees

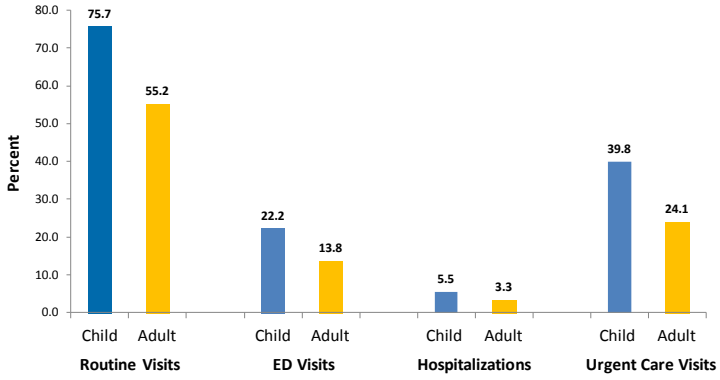
Healthcare Utilization

Healthcare utilization measures may be used to assess morbidity and asthma control. Although routine office visits for asthma are highly recommended and are paramount for effective asthma management and control,[5] asthma-related hospital stays, emergency department visits, and urgent care visits may indicate the existence of poorly controlled asthma and serve as markers for increased risk of future asthma exacerbations. Healthcare utilization differs significantly by age and by race and ethnicity.

Adult and Child Healthcare Utilization

Children were more likely to have one or more routine office visits, emergency department visits, and urgent care visits for asthma (75.7% vs. 55.2%, 22.2% vs. 13.8%, and 39.8% vs. 24.1%, respectively).

Figure 4: Asthma healthcare utilization among children and adults with current asthma: National Asthma Control Program Grantees,* 2010



Source: Asthma Call-Back Survey (ACBS), Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention
* 33 National Asthma Control Program Grantees completed the ACBS for adults and 16 National Asthma Control Program Grantees completed the ACBS for children

Adult and Child Healthcare Utilization by Race and Ethnicity

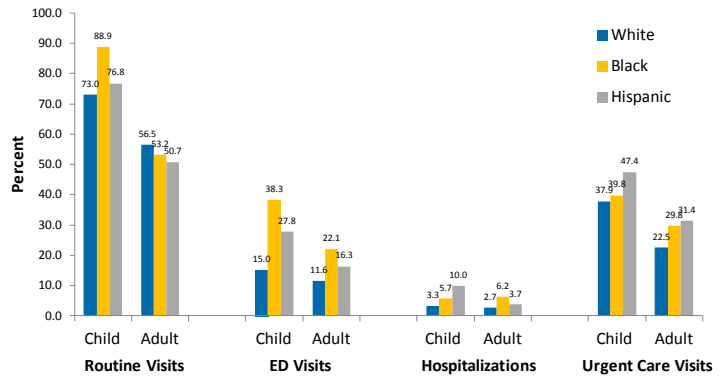
Children

- Black children (88.9%) were more likely to have routine office visits for asthma reported compared with white children (73.0%).
- Black children (38.3%) were more likely to have emergency department visits compared with white children (15.0%).
- A similar proportion of black (5.7%), Hispanic (10.0%), and white (3.3%) children were hospitalized for asthma.
- A similar proportion of black (39.8%), Hispanic (47.4%) and white (37.9%) children had urgent care visits for asthma.

Adults

- A similar proportion of white (56.5%), black (53.2%), and Hispanic (50.7%) adults had routine office visits for asthma.
- Black adults (22.1%) were nearly two times more likely to have emergency room visits for asthma compared with white adults (11.6%).

Figure 5: Asthma healthcare utilization among children and adults with current asthma by race and ethnicity*: National Asthma Control Program Grantees, 2010**



Source: Asthma Call-Back Survey (ACBS), Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention
*White and black categories are non-Hispanic
**33 NACP Grantees completed ACBS for adults and 16 NACP Grantees completed the ACBS for children

- Black adults (6.2%) were more likely to have hospital stays for asthma compared with white adults (2.7%).
- Hispanic (31.4%) and black (29.8%) adults were more likely to have urgent care visits for asthma compared with whites (22.5%).

Asthma Self-Management Education

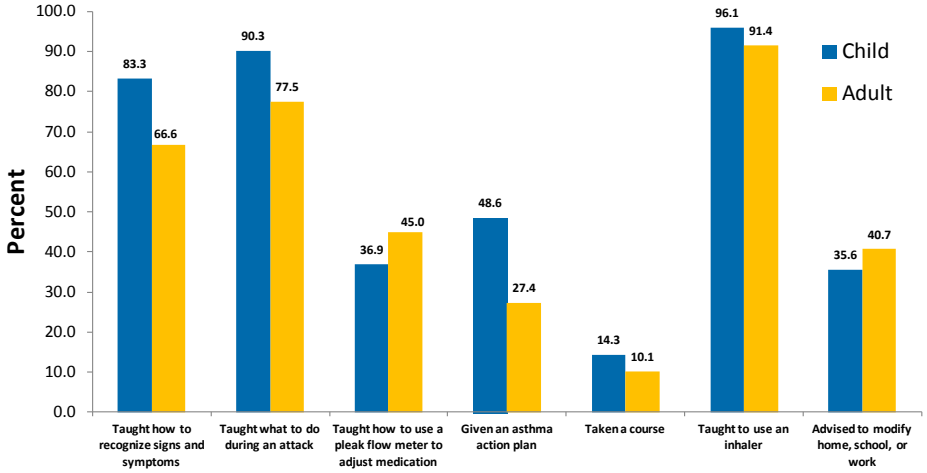
Asthma self-management education is essential to reducing asthma-related adverse health effects. Education also improves quality of life by reducing urgent care visits, emergency department visits, hospitalizations, and healthcare costs. Healthcare professionals (clinicians) should provide asthma self-management education to patients with asthma and their families or caregivers. This education should include a discussion of environmental controls. In addition, every patient with asthma (particularly those with moderate to severe persistent asthma, a history of severe exacerbations, or poorly controlled asthma) should be given a written asthma action plan providing instructions for daily asthma management and for recognizing and handling worsening asthma.[5]

Self-Management Education

Children

- Overall, children were more likely to receive asthma self-management education compared with adults.
- Children (83.3%) were more likely to be taught to recognize signs and symptoms of asthma compared with adults (66.6%).
- Children (90.3%) were more likely to be taught how to respond during an asthma attack compared with adults (77.5%).
- Children (48.6%) were more likely to report having an asthma action plan compared with adults (27.4%).
- Children (14.3%) were more likely to report learning how to manage their asthma by taking a course compared with adults (10.1%).
- Children (96.1%) were more likely to be taught how to use an inhaler compared with adults (91.4%).

Figure 6. Asthma self-management education among children and adults with current asthma: National Asthma Control Program Grantees,* 2010



Source: Asthma Call-Back Survey (ACBS), Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention
*33 National Asthma Control Program Grantees completed the ACBS for adults and 16 National Asthma Control Program Grantees completed the ACBS for children

Adults

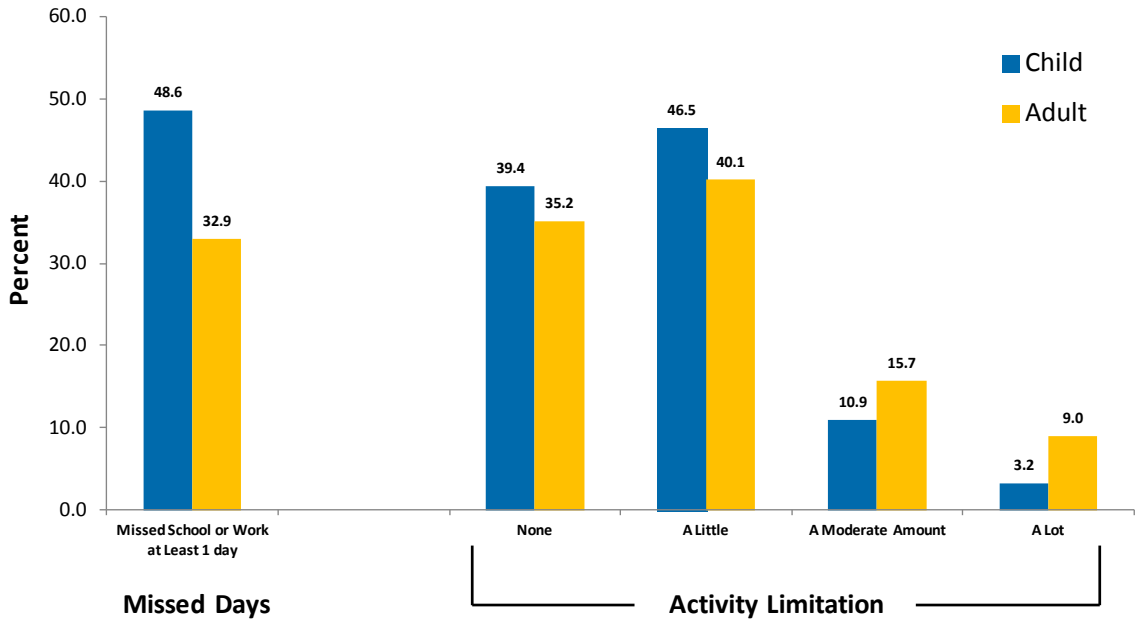
- Adults (45.0%) were taught to how to use a peak flow meter to adjust their asthma medications more frequently compared with children (36.9%).
- There were no differences in adults (40.7%) and children (35.6%) who were told to modify their school or home environments to remove asthma triggers.

Missed School and Work Days and Activity Limitations

Suboptimal asthma control can lead to loss of productivity resulting in missed school days and missed work days. In 2007, the estimated cost of asthma to society from loss of productivity was $3.8 billion.[2]

- More children missed one or more days of school (48.6%) compared with adults who missed one or more days of work (32.9%) due to asthma.
- The proportion of children (39.4%) and adults (35.1%) reporting no activity limitation due to asthma were similar.
- Children were more likely to report a little activity limitation (46.5%) compared with adults (40.1%)
- More adults compared with children reported a moderate amount (15.7% compared with 10.9%) or a lot of activity limitation (9.0% compared with 3.2%) due to asthma.

Figure 7. Missed days of school or work and activity limitations among school-age children* and adults with current asthma: National Asthma Control Program Grantees, 2010**



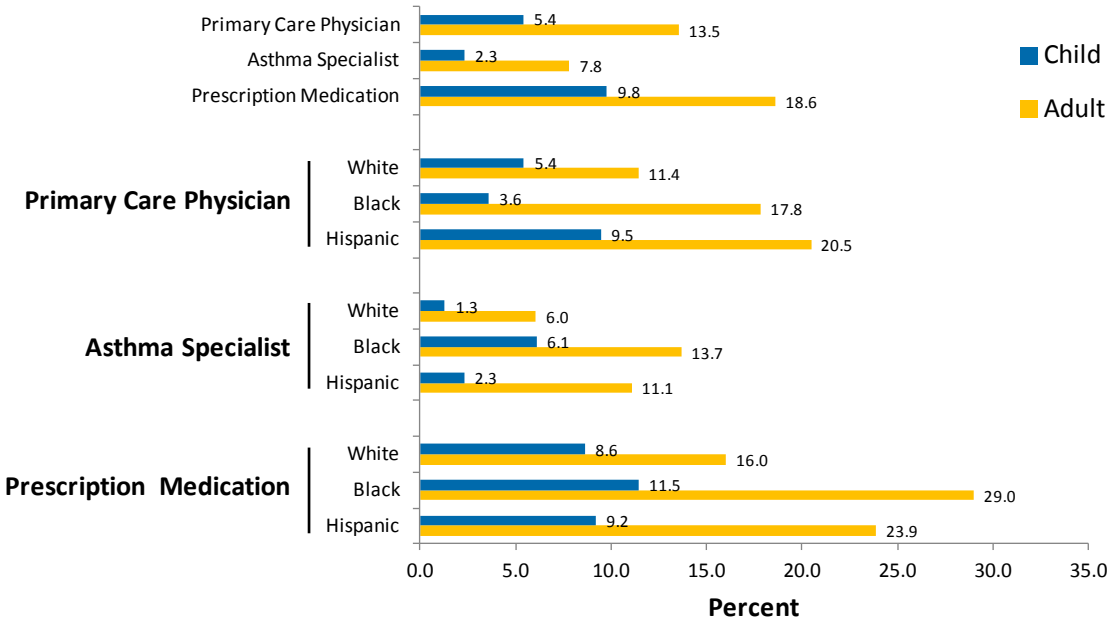
Source: Asthma Call-Back Survey (ACBS), Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention
*School-age children are children aged 5-17 years
**33 National Asthma Control Program Grantees completed ACBS for adults and 16 National Asthma Control Program Grantees completed the ACBS for children

Cost of Care as a Barrier

Healthcare visits to a primary care physician or an asthma specialist, as well as the ability to purchase prescription asthma medications, are vital to asthma care and management. Cost barriers to obtaining these services can lead to a lack of continuity and delays in obtaining needed medical care, and they can contribute to an increase in emergency department visits and hospitalizations.[2]

- More adults than children reported cost as a barrier to seeing a primary care physician (13.5% compared with 5.4%) or an asthma specialist (7.8% compared with. 2.3%), and purchasing prescription asthma medication (18.6% compared with 9.8%).
- More black adults than white adults reported cost as a barrier to seeing a primary care physician (17.8% compared with 11.4%), seeing an asthma specialist (13.7% compared with 6.0%), and purchasing prescription asthma medication (29.0% compared with 16.0%).
- More Hispanic adults than white adults reported cost as a barrier to seeing a primary care physician (20.5% compared with 11.4%), seeing an asthma specialist (11.1% compared with 6.0%), and purchasing prescription asthma medication (23.9% compared with 16.0%).

Figure 8. Cost barriers to medical care and purchase of prescription asthma medication among children and adults with current asthma by race and ethnicity*: National Asthma Control Program Grantees, 2010**

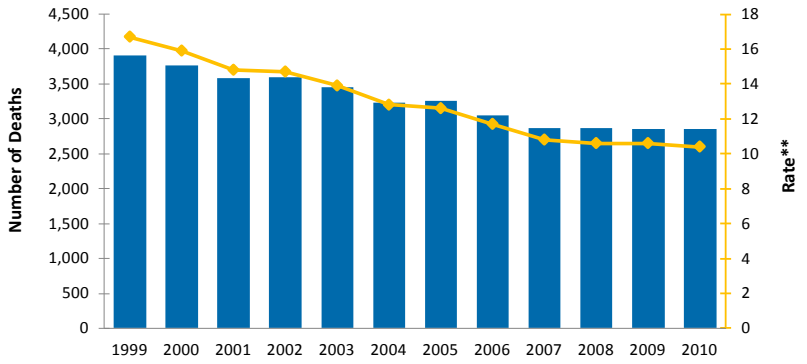


Source: Asthma Call-Back Survey (ACBS), Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention
*White and black categories are non-Hispanic
**33 National Asthma Control Program Grantees completed ACBS for adults and 16 National Asthma Control Program Grantees completed the ACBS for children

Deaths

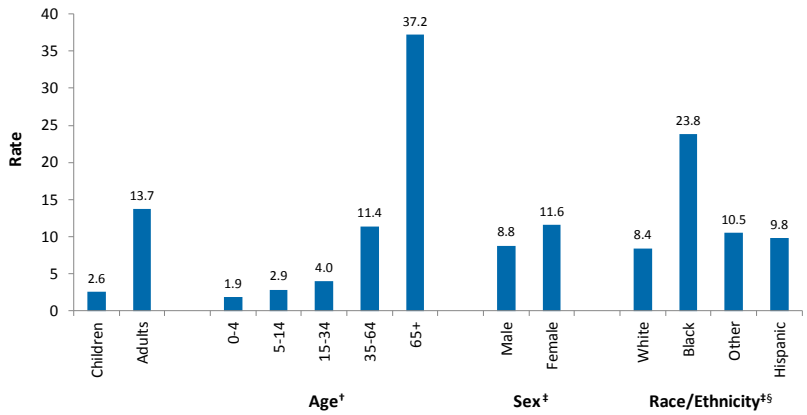
Asthma deaths are a rare event, particularly among children and young adults, with a majority of deaths occurring in persons aged 65 years and older.[7] Asthma deaths are thought to be largely preventable with early treatment and special attention to patients who are at high risk of asthma-related deaths (e.g., using two or more canisters of short-acting beta agonist per month, hospitalization or ED visit for asthma in the past month, two or more hospitalizations or three or more ED visits for asthma in the past year), and other risk factors (e.g., low socioeconomic status, comorbidities such as cardiovascular disease, other chronic lung disease).[5]

Figure 9. Asthma death rates and number of deaths: National Asthma Control Program Grantees,* 1999–2010



Source: National Vital Statistics System, National Center for Health Statistics, Centers for Disease Control and Prevention
*35 National Asthma Control Program Grantees. (Puerto Rico is excluded)
**Age-adjusted rate per million population

Figure 10. Asthma death rates by age, sex, and race/ethnicity: National Asthma Control Program Grantees,* 2010



Source: National Vital Statistics System, National Center for Health Statistics, Centers of Disease Control and Prevention
*35 National Asthma Control Program Grantees (Puerto Rico is excluded)
†Crude rate per million population
‡Age-adjusted rate per million population
§Race categories are non-Hispanic

Among the 35 NACP grantees, asthma deaths decreased from 16.7 per million (n=3,906) in 1999 to 10.4 per million (n=2,858) in 2010.

AGE

Adults (13.7 per million) were nearly seven times more likely than children (2.6 per million) to die due to asthma.

The asthma death rate was higher among persons aged 65 years and older (37.2 per million) compared with persons aged 0-4 years (1.9 per million), 5-14 years (2.9 per million), 15-34 years (4.0 per million), and 35-64 years (11.4 per million).

SEX

Females had a higher asthma death rate (11.6 per million) compared with males (8.8 per million).

RACE/ETHNICITY

Blacks (23.8 per million) were 2 to 3 times more likely to die due to asthma compared with whites (8.4 per million), others (10.5 per million) and Hispanics (9.8 per million).

Conclusions

Current asthma prevalence varied among age, sex, and racial/ethnic groups. Among adults, current asthma prevalence was higher among females, 18-24 year olds and multi-race and black persons. Among children, current asthma prevalence was higher among males, and multi-race and black persons. There were differences in current asthma prevalence among adults in certain educational and economic groups and adults who had certain behavioral risk factors. Adults who were either high school or college graduates or had a household income of >$75,000 had lower asthma prevalence. Previous studies indicate that obesity and exposure to tobacco smoke have been associated with increased asthma severity.[8,12,13] Lower body weight and being a never or former smoker appeared to have a protective effect; thus current asthma prevalence was lower in these groups.

Routine office visits and asthma self-management education are important in the management and control of asthma, while emergency department visits and urgent care visits may be indicators of poorly controlled asthma. Routine office visits, emergency department visits and urgent care were higher among children compared to adults as well as higher among black and Hispanic adults and children compared to their white counterparts. A key component to asthma management is access to primary care physicians and/or asthma specialists as well as having the ability to purchase prescription asthma medications. Adults were more likely to have cost as a barrier to medical care compared to children. Black and Hispanic adults were also more likely to report cost as a barrier to medical care compared to white adults. Typically, compared to adults, children were more likely to have received asthma self-management education. While adults were more likely to have been taught to use a peak flow meter to adjust their asthma medications than children, a similar proportion of adults and children had been told to modify the school or home environment to remove asthma triggers. Although the National Asthma Education and Prevention Program (NAEPP) guidelines recommend that every person with asthma receive an asthma action plan, less than half of children and less than a third of adults reported ever receiving one.[5] Another indicator of poorly controlled asthma is missed days of school or work and activity limitation due to asthma. More children missed one or more days of school than adults who missed work. Additionally, adults were more likely to report having greater levels of activity limitation.

Asthma deaths are a rare event and are thought to be largely preventable. Increased hospitalizations and emergency department visits are risks for death due to asthma. Asthma deaths are most common among older adults, females and blacks.

Asthma Facts – CDC's National Asthma Control Program Grantees is a report produced by the CDC National Asthma Control Program (NACP) that describes asthma prevalence, healthcare utilization, asthma self-management education, and mortality for the program's funded grantees in 34 states, the District of Columbia, and Puerto Rico. The findings in this report are subject to at least one limitation. BRFSS data are based on adult self-report and adult proxy responses for children; therefore, the results may be affected by inaccurate recall. The findings suggest the need to continue efforts at the local, state, and national levels to promote better asthma self-management education and improve asthma outcomes.

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Technical Notes

Current Asthma Prevalence

Data Source: Behavioral Risk Factor Surveillance System (BRFSS), 2010

More information is available at http://www.cdc.gov/brfss/.

Adult Current Asthma Prevalence—NACP Funded Grantees (36): Alabama, California, Connecticut, District of Columbia, Florida, Georgia, Hawaii, , Illinois, Indiana, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, New Hampshire, New Jersey, New Mexico, New York, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, Puerto Rico, Rhode Island, Texas, Utah, Vermont, Washington, West Virginia, Wisconsin

Adult current asthma prevalence is defined as a "yes" response to the BRFSS core questions "Have you ever been told by a doctor, nurse or other health professional that you had asthma?" and "Do you still have asthma?"

Child Current Asthma Prevalence—NACP Funded Participating Grantees (32): Alabama, California, Connecticut, District of Columbia, Georgia, Hawaii, Illinois, Indiana, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Mississippi, Missouri, Montana, New Jersey, New Mexico, New York, Ohio, Oklahoma, Oregon, Pennsylvania, Puerto Rico, Rhode Island, Texas, Utah, Vermont, Washington, West Virginia, Wisconsin

Child asthma prevalence data are produced from the CDC-funded states and territories (n=32) that participated in the BRFSS Random Child Selection and Childhood Asthma Prevalence modules.

Child current asthma prevalence is defined as a "yes" response to the questions, "Has a doctor, nurse or other health professional said that the child has asthma?" and "Does the child still have asthma?"

More information on adult and child current asthma prevalence is available at http://www.cdc.gov/asthma/asthmadata.htm.

Definitions

- Adults: Aged 18 years and older
- Child/Children: Aged 17 years or younger
- Multi-race: Represents persons who reported more than one race when asked "Which one of the following would you say is your race?"

Healthcare Utilization, Asthma Education and Management, Missed School and Work Days, Activity Limitations, and Cost of Care as a Barrier

Data Source: Asthma Call-Back Survey, 2010

The Asthma Call-back Survey (ACBS) is funded by CDC's National Asthma Control Program (NACP). More information is available at http://www.cdc.gov/asthma/ACBS.htm.

NACP- Participating Grantees (33 adult survey): Alabama, California, Connecticut, District of Columbia, Florida, Georgia, Hawaii, Illinois, Indiana, Louisiana, Maine, Maryland, Massachusetts, Michigan, Mississippi, Missouri, Montana, New Hampshire, New Jersey, New Mexico, New York, Ohio, Oklahoma, Oregon, Pennsylvania, Puerto Rico, Rhode Island, Texas, Utah, Vermont, Washington, West Virginia, Wisconsin,

NACP- Participating Grantees (16 child survey): Connecticut, Georgia, Hawaii, Indiana, Maryland, Michigan, Mississippi, Montana, New Jersey, New Mexico, Oklahoma, Pennsylvania, Texas, Utah, Vermont, Washington

Definitions

- Adults: Aged 18 years and older
- Child/Children: Aged 17 years or younger
- School-age: 5–17 years
- Multi-race: Represents persons who reported more than one race when asked “Which one of the following would you say is your race?”

Tests of Significance

All stated comparisons (e.g., higher, lower, similar) indicate that the group is statistically significantly different based on a non-directional 2-tailed z test at the $p < .05$ level. Differences between some groups may appear higher than among the reference groups (e.g., children, whites), but the differences were not statistically significant.

Deaths

Data Source: The National Vital Statistics System (NVSS), CDC WONDER

Death data (1999–2010) were obtained from CDC WONDER application, which uses data from the National Vital Statistics System (NVSS) mortality files. More information about death data is available at http://www.cdc.gov/nchs/deaths.htm and http://wonder.cdc.gov/.

NACP-Funded Grantees (34 states and DC, excludes Puerto Rico): Alabama, California, Connecticut, District of Columbia, Florida, Georgia, Hawaii, Illinois, Indiana, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, New Hampshire, New Jersey, New Mexico, New York, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, Texas, Utah, Vermont, Washington, West Virginia, Wisconsin

Asthma death counts and rates are based on records in which asthma was listed as the underlying cause of death and coded as ICD-10 J45–J46. Graph points of the rates are presented per 1 million population. Rates are adjusted to the 2000 US standard population.

Definitions

- ICD-10: Refers to the International Classification of Diseases, tenth revision. It is designed to promote international comparability in the collection, processing, classification, and presentation of disease-related statistics. More information is available at http://www.cdc.gov/nchs/icd/icd10.htm
- Race: Utilizes bridged race categories. More information is available at www.cdc.gov/nchs/nvss/bridged_race.htm
- Age-adjusted (age-standardized) rate: A mathematical method of altering the age structure in populations that are being compared to account for differences in the age distribution of the population. More information about age-adjusting is available at http://www.cdc.gov/nchs/data/nvsr/nvsr49/nvsr49_09.pdf.

Tests of Significance

All stated comparisons (e.g., higher, lower, similar) indicate that the group is statistically significantly different based on a non-directional 2-tailed z test at the $p < .05$ level. Differences between some groups may appear higher than among the reference groups (e.g., children, whites), but the differences were not statistically significant.

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