Colorado

Asthma Surveillance Report 2004





COLORADO **ASTHMA** PROGRAM

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Executive Summary

The data in the Asthma Surveillance Report show the need for a clearer understanding of who has asthma, how severe it is, and how can a strategy be developed to better assist Coloradans impacted by it. In 1998, data extrapolated from the 1995 National Health Interview Survey showed Colorado tied with California for the second highest prevalence of asthma in the country (second only to a 7.2 percent estimate for Nevada). The estimated prevalence of 7.1 percent of the Colorado population meant that approximately 283,700 people in the state had asthma.[1] The purpose of this report is to gather reliable state and national data that will assist in understanding who has asthma and what can be done to decrease the burden of the disease.

Asthma is an all-too-common chronic disease of the lungs that is characterized by intermittent episodes of wheezing, shortness of breath, and chest tightness. Although symptoms are often reversible, inflammation and muscular constriction around bronchial tubes can cause permanent damage to lung tissue. Asthma attacks are primarily a sudden hyperresponse to stimuli such as mold/mildew, pet dander, allergens, environmental tobacco smoke, air pollutants (ozone, exhaust fumes, dust, strong odors, etc.), cold air, exercise, and pollen. While it is relatively rare, an asthma attack can result in death.

Nationally, asthma impacts 14 million people, of which 6.3 million are children, according to figures from by the Centers for Disease Control and Prevention (CDC).[2] The same survey also estimated that 14 million school days and more than 14 million work days are missed each year due to asthma. The CDC estimates that more than 465,000 hospitalizations each year are attributed to asthma. Through careful monitoring and management, most hospitalizations can be prevented. Hospitalization occurs more than three times more often for African Americans compared to whites (32 per 10,000 population versus 10.6 per 10,000 respectively).

Mortality is also a preventable outcome, yet the CDC reported more than 4,487 deaths due to asthma in 2000. Once again, African Americans are disproportionately impacted. African Americans die at a rate more than three times higher than that of whites (4.0 per 100,000 versus 1.3 per 100,000 respectively).[3]

In Colorado asthma is estimated to currently impact more than 250,000 adults according to a recent Behavioral Risk Factor Surveillance System (BRFSS) questionnaire.[4] There are no current estimates on the number of children with asthma younger than age 18. There were nearly 4,000 hospitalizations due to asthma in 2000 of which more than 1,700 were among children, according to Colorado Hospital Association data.[5] As with national data, in Colorado, African Americans are hospitalized at a rate more than 3.5 times that of whites (22.2 per 10,000 versus 6.1 per 10,000). Colorado had 59 deaths due to asthma in 2000. African Americans died from asthma at a rate more than two times that of whites (33.5 per million versus 14.5 per million).[6]

This initial effort to outline the scope and impact of this disease in Colorado, would not have been possible without funding and assistance from the Centers for Disease Control and Prevention.

[1] *Forecasted State-Specific Estimates of Self-Reported Asthma Prevalence—United States, 1988. MMWR December 4, 1998; 47(47) 1022-5.*

[2] *2001 National Health Interview Survey*

[3] *American Lung Association. Epidemiology and Statistics Unit, Best Practices and Program Services. Trends in Asthma Morbidity and Mortality, February 2002.*

[4] *Unpublished Report, 2000–2001 Colorado BRFSS Survey.*

[5] *Unpublished Report, 2000 Colorado Hospital Association dataset.*

[6] *Unpublished Report, 2000 Colorado Death dataset.*

Introduction

Asthma is a chronic disease of the lungs that impacts both children and adults. It is characterized by shortness of breath, wheezing, chest tightness, inflammation of the lung tissue and overproduction of mucous, that causes airway blockage. If not relieved, these conditions may lead to death. Asthma is a hyperresponsive reaction to "triggers" like environmental tobacco smoke, pet fur and dander, allergens, particles in the air, strong odors, mold/mildew, dust mites, and cockroaches. The last three are not very common in Colorado due to low humidity.

The cause of asthma is unknown. Researchers and clinicians know that asthma is a manageable disease when treated with appropriate short and long-term medications. The keys to leading a normal lifestyle is a management plan tailored to the specific triggers that cause the response and consistent use of appropriate treatment. It is a firmly held belief among asthma experts that all but the most severe persons with asthma should be able to lead normal, active lifestyles.

The purpose of this surveillance report is to gather and analyze in one document, the current reliable statewide and national data regarding asthma. The intention is to formulate ways to reduce the number of hospitalizations, emergency department visits, missed school/work days, and deaths, due to this very manageable disease. This report will also be a guide in recognizing areas where further data gathering and research are needed to give a clearer picture of the impact asthma has on Coloradans.

In the last 20 years there has been a dramatic increase in the number of individuals with asthma. According to data from the Centers for Disease Control and Prevention (CDC), asthma increased 73.9 percent nationally from 1980 to 1996. As the number of people with the disease has increased, so have the number of hospitalizations, emergency department visits, absences from work/school, and deaths associated with asthma. During the period, from 1980–1996, the estimated number of hospitalizations in the United States for asthma increased from 408,000 to 474,000 (though the rate of hospitalizations dropped slightly from 19 per 10,000 population to 17.9 per 10,000). The estimated number of emergency department visits increased from 1,467,000 to 1,934,000 which means an estimated rate increase from 56.8 per 10,000 to 72.4 per 10,000.

The estimated number of absences from school rose from 6.6 million to 14.0 million, while the estimated number of absences from work rose from 6.2 million to 14.5 million. The annual number of deaths with asthma as an underlying cause nearly doubled from 2,891 to 5,667[1] between 1980 and 1998. The upward trend in deaths has flattened since that time. This may be due to changes in the classification system from the International Classification of Diseases Ninth and Tenth Revisions.

Although the rise in prevalence of asthma has been relatively even between African Americans and whites, several disparities between the groups have arisen. African Americans were hospitalized at an estimated rate of 58 percent greater than whites in 1980. By 1996 they were being hospitalized at an estimated rate more than 300 percent greater than whites. In 1980, the annual asthma death rate for African Americans was slightly more than two times that of whites. By 1996, the gap between the rates had increased to more than 2.5 times that of whites. Similarly the estimated rate for emergency department visits for whites grew from 43.7 per 10,000 population in 1992 to 59.4 per 10,000 in 1999, while for the same period the estimated rate for African Americans grew from 143.2/10,000 to 174.3/10,000.[1]

One of the keys to the development of a coordinated national approach to asthma has been the inclusion of eight objectives in the Healthy People 2010 Guidelines. They are:

- Reduce asthma deaths.
- Reduce hospitalizations for asthma.

- Reduce hospital emergency department visits for asthma.
- Reduce activity limitations among persons with asthma.
- Reduce the number of school or work days missed due to asthma.
- Increase the proportion of persons with asthma who receive formal patient education, including information about community and self-help resources, as an essential part of the management of their condition.
- Increase the proportion of persons with asthma who receive appropriate asthma care according to the National Asthma Education and Prevention Program (NAEPP) Expert Panel Report 2: Guidelines for the Diagnosis and Management of Asthma.
- Establish in at least 15 states a surveillance system for tracking asthma deaths, illness, disability, impact of occupational and environmental factors on asthma, access to medical care, and asthma management.

These objectives were created with the belief that "effective management of asthma comprises four major components: controlling exposure to factors that trigger asthma episodes, adequately managing asthma with medicine, monitoring the disease by using objective measures of lung function, and educating asthma patients to become partners in their own care."[2]

The Colorado Asthma Surveillance Report was created in an attempt to understand the public health crisis of asthma in Colorado, as it compares to the nation. The report could not have been completed without the assistance of the community of individuals and organizations working to fight this disease. Many of these dedicated individuals and groups have come together in the Colorado Asthma Coalition, a collaborative organization formed in 2000 as a partnership among the American Lung Association of Colorado, the Region VIII office of the Environmental Protection Agency, and the Colorado Department of Public Health and Environment.

[1] *Centers for Disease Control and Prevention. Surveillance Summaries, March 29, 2002. MMWR 2002:51(No. SS-1).*

[2] *U.S. Department of Health and Human Services.* Healthy People 2010: Understanding and Improving Health. *2nd ed. Washington, DC: U.S. Government Printing Office, November 2000.*

National Data

The last 20 years have seen major advances in the study of asthma and the personal, medical and financial impact it has in the United States. The data below represent a snapshot of the status of this chronic disease. Recent data have shown a shift toward lower numbers of hospitalizations and fewer deaths, but higher numbers of outpatient visits and emergency department visits. Additionally, there continues to be substantial racial disparity in many measures.

Health and Social Impact

- Asthma affects about 14 million people in the United States: 6.3 million are children.[1]
- In 2000, 4,487 people died from asthma in the United States, or a rate of 1.6 per 100,000 people.[2]
- Among children, asthma deaths are rare; in 2000, 223 children aged 0–17 years died from asthma, or 0.3 deaths per 100,000 children.[2]
- Lifetime asthma prevalence among adults in 2001 was 109 per 1,000 (22.2 million) compared to 126 per 1,000 for children 0–17 years (9.2 million).[2]
- Approximately 465,000 hospitalizations and 1.8 million emergency department visits were attributed to asthma in 2000.[2]
- Among children 0–17 years, there were 214,000 hospitalizations (30 per 10,000). Hospitalizations were highest among children 0–4 years who had 67 hospitalizations per 10,000.[4]

Economic Impact

- The total cost of asthma (among adults and children) to the U.S. economy was calulated to be approximately $12.7 billion for 2000, with direct costs contributing $8.1 billion and indirect costs (loss of work, lost school days, and mortality) for asthma $4.6 billion.[4]
- The annual cost of asthma-related in-patient hospital services in 2000 was more than $3.5 billion, and the annual cost of asthma-related emergency room visits was more than $650 million, according to estimates.[4]
- The total yearly cost of asthma treatment in the U.S. more than doubled between 1990 and 2000, from $6.2 billion to $12.7 billion.[4, 5]

Racial Disparities

- In 2000, non-Hispanic blacks had an asthma death rate over 200% higher than non-Hispanic whites and 160% higher than Hispanics.[6]
- The asthma hospitalization rate for blacks was 220% higher than for whites. Females had a hospitalization rate 25% higher than males in 2000.[2]
- Among respondents with current asthma, ED visits were reported with greater frequency by non-Hispanic blacks (37.2%) and Hispanic (26.0%) respondents and least frequently by non-Hispanic multiracial respondents (13.5%).[6]
- Non-Hispanic blacks were the most likely to die from asthma and had an asthma death rate over 200% higher than non-Hispanic whites and 160% higher than Hispanics.[6]

Sources:

[1] *2001 National Health Interview Survey*

[2] *CDC, National Center for Health Statistics. Asthma prevalence, health care use and mortality, 2000–2001. Available at http://www.cdc.gov/nchs/products/pubs/pubd/hestats/asthma/asthma.htm.*

[3] *Centers for Disease Control and Prevention. Self-Reported Asthma Prevalence and Control Among Adults—United States, 2001. MMWR, Vol. 52(17); 381–384, May 2, 2003.*

[4] *American Lung Association. Epidemiology and Statistics Unit, Best Practices and Program Services. Trends in Asthma Morbidity and Mortality, February 2002.*

[5] *Kevin B. Weiss, Peter J. Gergen, and Thomas A. Hodgson. An Economic Evaluation of Asthma in the U.S. The New England Journal of Medicine,1992, 326:862-6.*

[6] *Centers for Disease Control and Prevention. Asthma Prevalence and Control Characteristics by Race/Ethnicity—United States, 2002. MMWR, Vol. 53(7); 145–148, Feb 27, 2004.*

Asthma: Colorado Data

Asthma is a serious chronic disease that affects more than 14 million Americans including an estimated 283,700 Coloradans.[1]

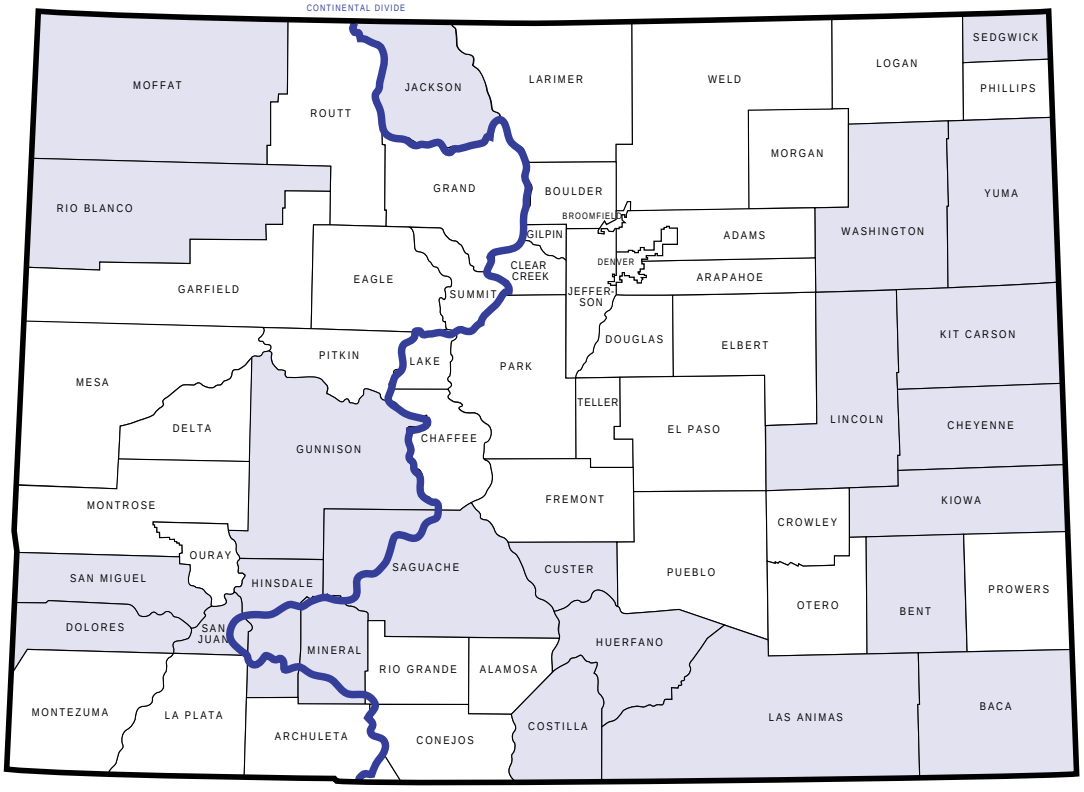
The most important change related to asthma in the last 10 years has come in the treatment of the disease. Through research and the development of more effective medications, the treatment of asthma has taken great strides forward. It is clear that the lives of most people with asthma do not need to be limited. By avoiding asthma triggers and the appropriate use of prescribed medications, asthma does not have to interfere with an optimal quality of life.

State Size and Geography

Bisected longitudinally by the Rocky Mountains, Colorado is the seventh largest state in the continental U.S., covering 103,600 square miles. The geography presents multiple factors that influence asthma and the efficiency and equality of health services delivery. The majority of the population, which is expected to reach more than 4.6 million by 2005, is concentrated in nine counties, which hold more than 75 percent of the Colorado populace and support most of the State's economic activity in, or near, urban areas.

Of the state's 63 counties, 23 are classified as "frontier", containing less than six people per square mile. Many of these sparsely populated counties are part of the mountainous "Western Slope" (referring to the area west of the continental divide), which has more than 54 peaks over 14,000 feet high. Another large area of low population density is the high plains portion of the state east of the Front Range (referring to the area immediately east of the mountains) of the Rocky Mountains.

Figure 1. Colorado Counties



23 FRONTIER COUNTIES

Baca
Bent
Cheyenne
Costilla
Custer
Dolores
Gunnison
Hinsdale
Huerfano
Jackson
Kiowa
Kit Carson
Las Animas
Lincoln
Mineral
Moffat
Rio Blanco
Saguache
San Juan
San Miguel
Sedgwick
Washington
Yuma

Population Demographics

2000 State Census

The U.S. Bureau of the Census in 2000 counted 4,301,261 individuals in Colorado, making it the 24th most populated state in the country. The census number amounts to an increase of more than one million people (30.6 percent) since the 1990 population count of 3.2 million. This equals an annual average growth rate of 2.7 percent, which compares to a national average of 2.3 percent implied by the Census Bureau's estimates during the decade.

Growing in population by more than 1 million between the 1990 and 2000 Census, the most recent birth rate shows an unprecedented 18.8 percent increase, adding more than 12,000 individuals to the population in 1999. A highly admired quality of life has drawn significant migration to both urban and rural areas.

The migration of people to the state to take advantage of the stable job market in the 1990s has resulted in a decrease in the state poverty level, which declined from 11.7 percent in 1990 to 10.5 percent in 1996. This translates to 14.6 percent of children under age 18, or roughly 180,000, living below the federal poverty line. Approximately 100,100 women of childbearing age also fall into this category. These numbers have likely increased during the economic downturn of 2000–2003. Many of those impacted are located in the southern counties of the state.

Despite the general state growth and prosperity over the past decade, it is clear that a significant portion of the current population does not have full access to many medical services. Additionally, there are profound disparities in the health status of various segments of the population, particularly among racial/ethnic groups. This is particularly obvious in a review of maternal and child health issues associated with the growth of the Hispanic community. The number of Hispanic births increased by more than 110 percent from 1990 to 2001.

Denver

Denver, Colorado, is an urban area which encompasses 154.6 square miles, situated east of the Rocky Mountains. It is home to 521,646 individuals.[2]

In Denver and throughout Colorado, the group represented in the category "Hispanic ethnicity" is composed of individuals with ancestral ties primarily to Mexico, Central America, and South America.

ETHNICITY	DENVER	COLORADO[3]
White, Non-Hispanic	66.1%	74.5%
Hispanic	22.8%	16.7%
African American, Non-Hispanic	12.5%	4.3%
Other	3.2%	1.7%

[1] *Centers for Disease Control and Prevention. MMWR, Vol. 47, No. 47;1022-1025, December 4, 1998.*

[2] *CDPHE, Vital Statistics, 1998. 1990 U.S. Census counts 480,866 Denver County residents.*

[3] *Population estimates are 2000-based estimates from the Demography Section, Colorado Division of Local Government. Estimates may vary slightly from other population estimates.*

Hospitalization Data

Hospital discharge data are collected by the Colorado Health and Hospital Association. Clinical, financial, and patient demographic information is collected for use by member hospitals and other organizations. Data from hospitals in Colorado, with an International Classification of Diseases Ninth Revision codes 493.0–493.9, were included in this evaluation. Unless otherwise noted, data include any hospitalizations where asthma was coded as the primary diagnosis.

Data for 1993–2001 were analyzed by calendar year. Rates for 1992–1999 were calculated using census estimates. Rates for 2000 and 2001 are based on 2000 Census data. Due to differences in the way race and ethnicity data are collected by the Census and the Colorado Health and Hospital Association, rates in this area were not calculated.

There are a number of limitations concerning the interpretation of these data. The system is designed to track hospitalizations and not individuals. The data used are unidentified, so repeat visits were not eliminated from the analyses. This will cause individuals whose asthma is poorly managed and who are hospitalized repeatedly, to be overestimated. Data regarding race and ethnicity are annually missing for, on average, 24.3 percent of the any mention cases and 17.1 percent of the primary diagnosis cases. The distribution of the missing data on more stable variables, gender and age, implies that this group is primarily white and Hispanic.

By Race/Ethnicity

Table 1. Colorado Asthma Hospital Discharges by Race/Ethnicity: Colorado Residents 1993–2001

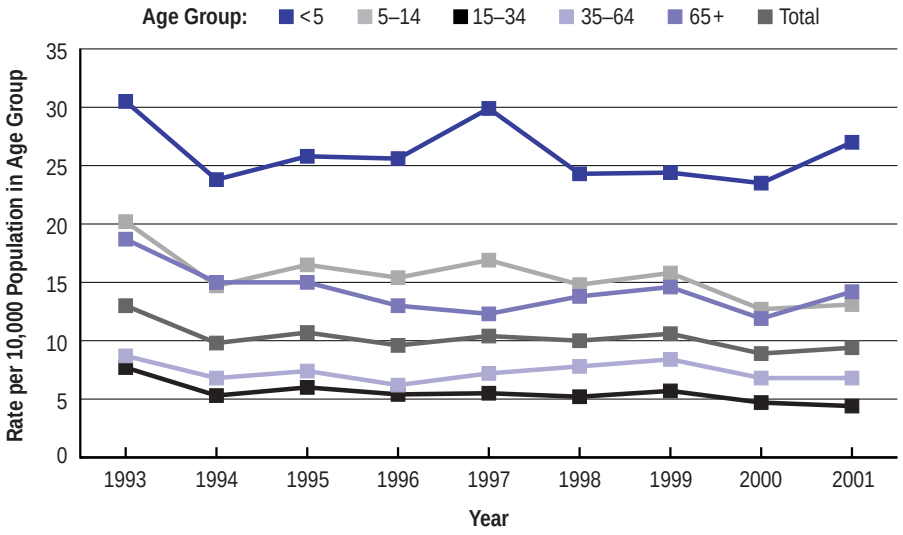
ETHNICITY	1993	1994	1995	1996	1997	1998	1999	2000	2001
White	2,645	2,225	2,568	2,176	2,331	2,382	2,385	2,121	2,254
African American	376	374	423	401	443	438	483	358	393
Hispanic	547	433	455	461	592	542	644	535	590
% Unknown	22.2%	14.7%	13.4%	16.9%	16.0%	15.2%	18.2%	18.7%	18.9%

Source: *Health Statistics Section, Colorado Department of Public Health and Environment, May 2003.*

Although Blacks make up less than five percent of the Colorado population, this group accounted for at least 10 percent of the hospital discharges for asthma in the combined years 1993–2001. The proportion of these discharges for the other race/ethnicity groups appears to be much closer to their distribution in the population, although, since there are almost 20 percent of discharges with race/ethnicity classified as other or unknown, it is not possible to describe the racial/ethnic breakdown of these discharges more completely.

By Age

Figure 2. Age-Specific Colorado Hospital Discharges, Rates for Asthma as Principal Diagnosis by Age Group: Colorado Residents 1993–2001

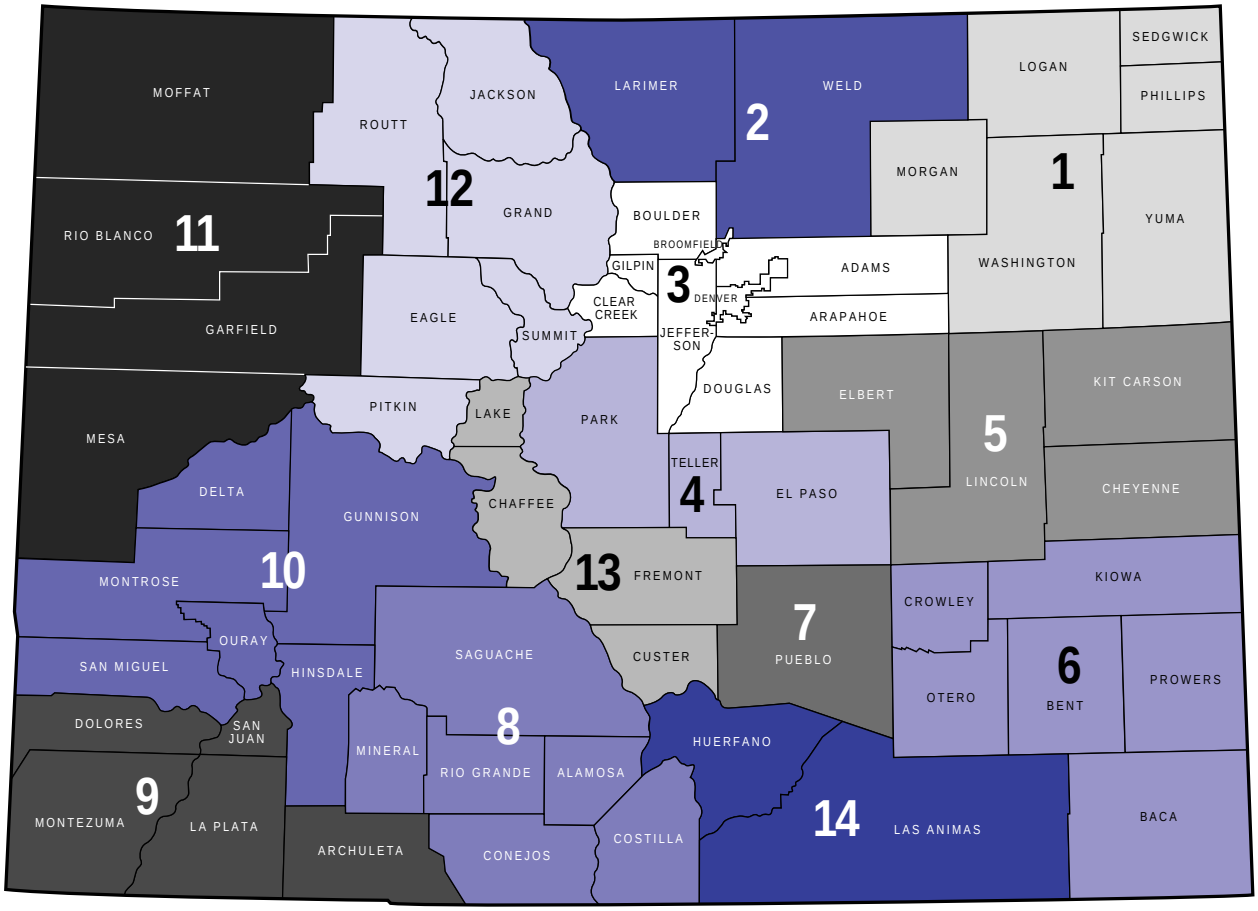


Rate is per 10,000 population in age group.
Age-adjusted rates are adjusted to the 2000 standard U.S. population using the direct method applied to 10-year age groups.
***Source:** Health Statistics Section, Colorado Department of Public Health and Environment, May 2003.*

The highest age-specific rates for hospital discharges with asthma as the principal diagnosis were for children and infants less than five years old. The lowest age-specific rates were for individuals ages 15–34 and 35–64.

By Planning and Management Region (PMR)

Figure 3. State Planning and Management Regions



Planning and Management Regions are for administrative purposes only. The state was divided into 14 regions, most regions combining two or more counties within a geographical area.

Age-adjusted rates are used to compare rates among different geographical areas as they are adjusted to be independent of the age distributions in the different populations. Although overall the age-adjusted rates for most of the Planning and Management Regions (PMR) in Colorado appear to have declined during the period from 1993 to 2001, comparisons for those years combined show rates that range from 4.9 discharges per 10,000 population in PMR 12 to 13.8 discharges per 10,000 population in PMR 7.

Table 2. Colorado Hospital Discharges and Age-Adjusted Rates for Asthma as Principal Diagnosis by Planning and Management Region: Colorado Residents 1993–2001

	1993		1994		1995		1996		1997		1998		1999		2000		2001	
	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate
PMR 1	79	12.2	61	9.1	63	8.9	60	8.6	54	7.7	63	8.9	73	10.4	61	8.6	71	9.8
PMR 2	342	10.2	262	7.6	271	7.6	298	7.9	286	7.6	324	8.5	318	8.0	280	6.8	283	6.6
PMR 3	2,925	14.7	2,136	10.6	2,565	12.4	2,283	10.8	2,666	12.3	2,484	11.2	2,813	12.3	2,442	10.4	2,630	11.0
PMR 4	414	9.0	384	7.9	400	7.9	384	7.5	430	8.1	515	9.7	544	10.0	441	8.0	549	9.8
PMR 5	40	14.5	26	9.4	26	8.9	32	10.1	45	13.5	53	16.2	44	12.5	49	14.5	52	14.6
PMR 6	133	26.0	106	20.3	102	20.2	115	22.4	52	10.2	44	8.6	106	20.0	52	10.0	47	8.9
PMR 7	242	18.5	180	13.9	168	12.6	165	12.2	194	14.2	210	15.1	197	14.1	160	11.3	183	12.4
PMR 8	57	13.5	57	13.0	74	16.3	42	9.4	65	14.9	39	8.7	41	8.9	35	7.7	31	6.8
PMR 9	56	8.8	46	6.7	44	6.2	47	6.7	44	6.0	40	5.4	28	3.7	26	3.3	38	4.8
PMR 10	70	9.9	81	10.9	65	8.4	39	9.0	44	5.6	68	8.2	42	4.9	43	4.8	40	4.3
PMR 11	166	10.8	143	9.1	154	9.6	133	8.1	138	8.2	132	7.6	122	6.9	112	6.2	98	5.3
PMR 12	44	6.8	44	5.5	32	3.7	46	5.8	33	3.4	47	5.1	36	4.2	32	2.8	44	4.0
PMR 13	88	14.5	82	13.1	78	11.9	51	7.8	63	9.1	59	8.6	83	11.9	82	11.0	74	10.0
PMR 14	16	7.4	19	8.4	25	11.2	43	18.2	29	13.9	13	6.0	21	8.9	11	4.2	15	6.8

Notes:
Where county of residence is unknown, zip codes and birth proportions are used to assign a county.
Rate is per 10,000 population in age group.
Age-adjusted rates are adjusted to the 2000 standard U.S. population using the direct method applied to 10-year age groups.
N=number of cases
Source: *Health Statistics Section, Colorado Department of Public Health and Environment, May 2003.*
N=number of cases

By County

Age-adjusted rates of hospitals discharge for asthma as the principal diagnosis can be compared by county of residence. The rates for 1993–2001 range from 0.0 to 20.7. Even for the nine-year period, some counties have very small numbers. The rates based on these small numbers should be viewed with caution.

Table 3. Colorado Hospital Discharges and Age-Adjusted Rates for Asthma as Principal Diagnosis by County: Colorado Residents 1993–2001

	1993–2001			1993–2001			1993–2001	
	N	Rate		N	Rate		N	Rate
Adams	3,168	10.7	Fremont	414	10.7	Montrose	250	8.6
Alamosa	184	14.4	Garfield	272	7.9	Morgan	298	12.3
Arapahoe	4,126	10.2	Gilpin	9	2.0	Otero	209	11.0
Archuleta	13	1.9	Grand	67	7.3	Ouray	8	2.7
Baca	285	72.3	Gunnison	35	2.9	Park	68	6.9
Bent	65	13.0	Hinsdale	0	0.0	Phillips	36	8.3
Boulder	1,904	8.6	Huerfano	89	13.4	Pitkin	44	4.3
Chaffee	135	9.9	Jackson	5	3.3	Prowers	88	6.7
Cheyenne	50	22.4	Jefferson	3,924	8.9	Pueblo	1,699	13.8
Clear Creek	23	3.2	Kiowa	82	52.1	Rio Blanco	36	6.7
Conejos	65	8.4	Kit Carson	148	20.7	Rio Grande	104	9.5
Costilla	34	10.3	Lake	95	15.3	Routt	60	4.3
Crowley	29	8.2	La Plata	193	5.6	Sanguache	49	9.8
Custer	16	6.3	Larimer	1,294	6.6	San Juan	3	5.3
Delta	188	7.6	Las Animas	103	7.6	San Miguel	11	3.2
Denver	9,099	20.3	Lincoln	60	10.9	Sedgwick	35	14.7
Dolores	4	2.5	Logan	122	6.9	Summit	47	3.1
Douglas	689	5.6	Mesa	748	7.5	Teller	100	5.9
Eagle	135	4.6	Mineral	5	9.7	Washington	25	5.4
Elbert	109	7.8	Moffat	142	12.8	Weld	1,370	9.5
El Paso	3,893	8.8	Montezuma	156	7.4	Yuma	69	7.9
						Unknown	71	0.0

Notes:
Where county of residence is unknown, zip codes and birth proportions are used to assign a county.
Rate is per 10,000 population in age group.
Age-adjusted rates are adjusted to the 2000 standard U.S. population using the direct method applied to 10-year age groups.
N=number of cases
Source: *Health Statistics Section, Colorado Department of Public Health and Environment, May 2003.*

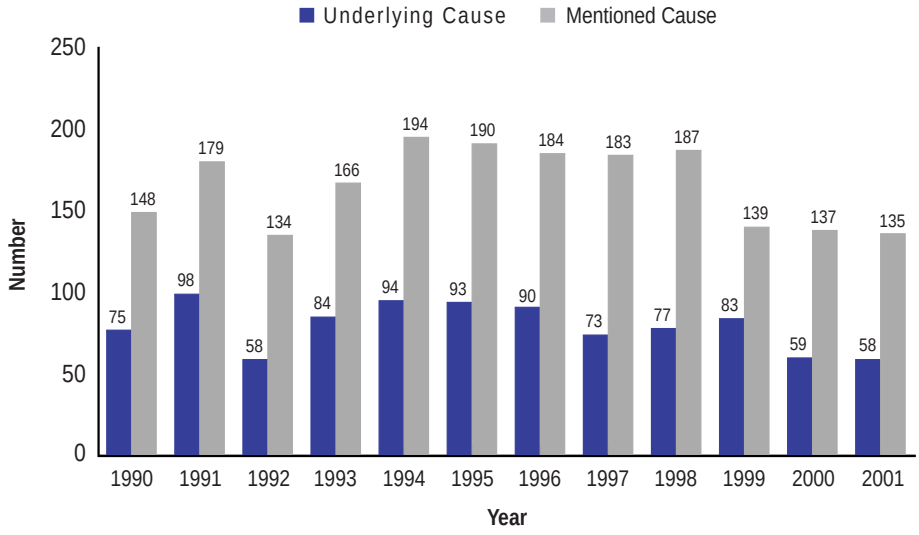
Mortality Data

Colorado's Vital Records Section of the Colorado Department of Public Health and Environment is responsible for the collection and analysis of death records which occur in Colorado and death records of Colorado residents which occur out of state. The data presented in this section are for Colorado residents only. Data through 1998 were coded using the International Classification of Diseases Ninth Revision codes 493.0–493.9. Thereafter the International Classification of Diseases Tenth Revision codes J45–J46 were used.

U.S. Census estimates based on the 1990 census count for Colorado's population were used to calculate rates prior to 2000. Thereafter 2000 census figures were used.

Comparative national data were obtained from the National Center for Health Statistics.

Figure 4. Asthma Mortality by Underlying and Mentioned Causes: Colorado Residents 1990–2001

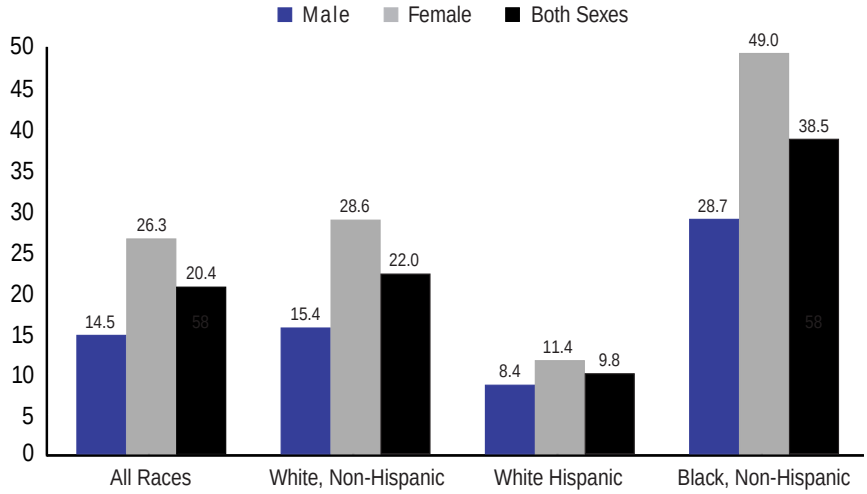


Source: *Health Statistics Section, Colorado Department of Public Health and Environment, November 2003.*

By Race/Ethnicity

The data reflect the trend seen in national data regarding higher mortality rates for blacks. Additionally, there are notably smaller rates for Hispanics, also reflective of trends among Hispanic populations with Mexican heritage seen at the national level.

Figure 5. Annual Average Crude Mortality Rates from Asthma by Race/ Ethnicity and Sex: Colorado Residents 1990–2001



Rates are crude rates per 1,000,000 population in each gender and race/ethnicity group.
***Source:** Health Statistics Section, Colorado Department of Public Health and Environment, January 2003.*

The data reflect that Colorado has not achieved the mortality goals set forth in Healthy People 2010 (Table 5), and Colorado's average crude mortality rates (Table 4) are mostly higher than national averages. Rates for Hispanics are not shown in the latter table due to reporting differences between state and national datasets.

Table 4. Crude Mortality Rates from Asthma by Race/Ethnicity and Sex: Colorado Residents and U.S. 2000

	COLORADO 2000*	U.S. 2000**
Total	2.0	1.6
White	2.2	1.3
Black	3.8	4.0
Male	1.5	1.3
Female	2.6	1.8

Rates are crude rates per 100,000 population in each gender and race/ethnicity group.
Source: Health Statistics Section, Colorado Department of Public Health and Environment, April 2003.*
***Source:** Centers for Disease Control and Prevention, National Center for Health Statistics.*

By Age Group

Table 5. Deaths and Age-Specific Mortality Rates from Asthma by Age Group: Colorado Residents 1990–2001 Combined

AGE	COLORADO 1990–2001*	HEALTHY PEOPLE 2010 GOAL**
<5	1.8	1.0
5–14	2.2	1.0
15–34	4.3	3.0
35–64	17.5	9.0
64+	122.9	60.0

Rates are crude rates per 1,000,000 population in each age group.
**Source:* *Health Statistics Section, Colorado Department of Public Health and Environment, April 2003.*
***Source:* *U.S. Department of Health and Human Services.*

Colorado's total crude mortality rate from asthma for the years 1990–2001 is 2.0 deaths per 100,000 population.

Behavioral Risk Factor Surveillance System Data

The Behavioral Risk Factor Surveillance System (BRFSS) is designed to monitor the prevalence of health behaviors and preventive health practices associated with the leading causes of premature death, disability, and disease. The BRFSS includes all 50 states, three territories, and the District of Columbia, making it the largest ongoing telephone health survey in the world. The Colorado BRFSS was initiated in 1990 as a joint project of the Colorado Department of Public Health and Environment and the Centers for Disease Control and Prevention. Non-institutionalized Colorado adults ages 18 and older are selected to be interviewed using a random digit dialing sampling technique. Between 1990 and 2001, an average of 2,100 interviews were completed each year. Since 2002, more than 4,000 interviews have been completed each year. Data collected over an entire year are combined and weighted to the age and sex distribution of the state to develop statewide estimates of various health behaviors.

Two years of data (2000 and 2001) were combined to produce estimates of adult asthma in Colorado, resulting in a sample size of 5,090. The following questions were included in the 2000 and 2001 surveys: "Have you ever been told by a doctor, nurse, or other health professional that you had asthma?" and "Do you still have asthma?" Please note that the estimates presented in this report represent an average for survey years 2000 and 2001. Statistical significance was determined by comparing 95 percent confidence intervals.

While scientific survey procedures are followed in all phases of the survey, the data should be regarded as estimates. Colorado residents without telephones (approximately 4 percent) and those who do not speak either English or Spanish are excluded from the study. In addition, BRFSS measures are self-reported, and undiagnosed people with asthma are not captured in the survey.

Key Findings of the Behavioral Risk Factor Surveillance System

- An estimated 10.9 percent, or more than 340,000 Colorado adults have, at one point, had asthma. An estimated 7.8 percent of Colorado adults still have asthma.
- Lifetime asthma prevalence varies significantly by age, sex, education level, and employment status. Colorado adults who currently have asthma are more likely to be female (9.4 percent) than male (5.1 percent), and unemployed (15.7 percent) than employed (6.8 percent).
- Compared to Colorado adults who have not had asthma, those who do are significantly more likely to have fair or poor health status, and to have experienced poor mental or physical health in the past month.
- Health care utilization, including doctor visits and emergency room visits, is significantly higher for adults with asthma in Colorado compared to those without asthma.
- Adults with asthma in Colorado have a significantly higher prevalence of obesity compared to those without asthma (19.9 percent and 13.9 percent, respectively).

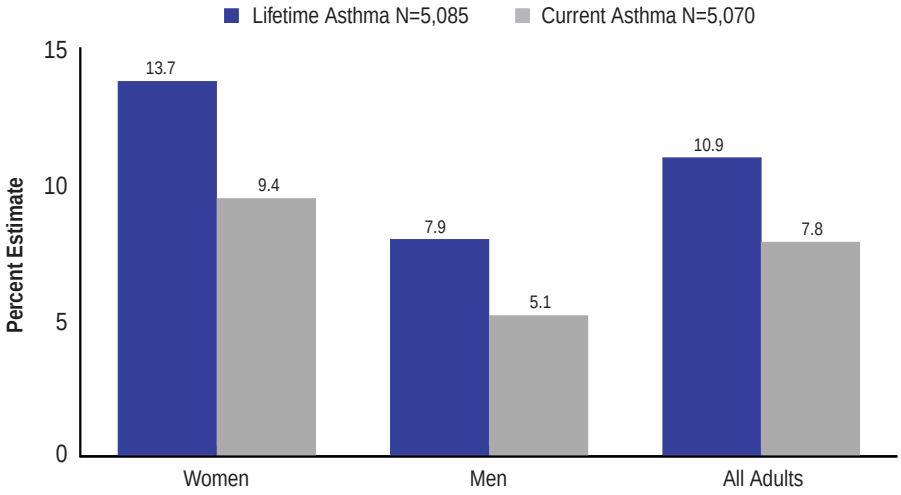
The questions asked in the BRFSS about asthma and smoking only address the proportion of people with asthma that smoke tobacco and do not allow an assessment of whether smoking by people with asthma has affected the severity of their asthma. They also do not allow assessment of whether exposure to passive smoke has acted as a trigger for asthma attacks.

Prevalence Estimates—Combined

By Sex

The lifetime prevalence of asthma among Colorado adults for 2000–2001 was 10.9 percent. This prevalence was significantly higher for women (13.7 percent) compared to men (7.9 percent). Approximately eight percent of Colorado adults currently have asthma. The prevalence is significantly higher for women (9.4 percent) compared to men (5.1 percent).

Figure 6. Asthma Prevalence by Gender: Colorado Adults, BRFSS 2000–2001

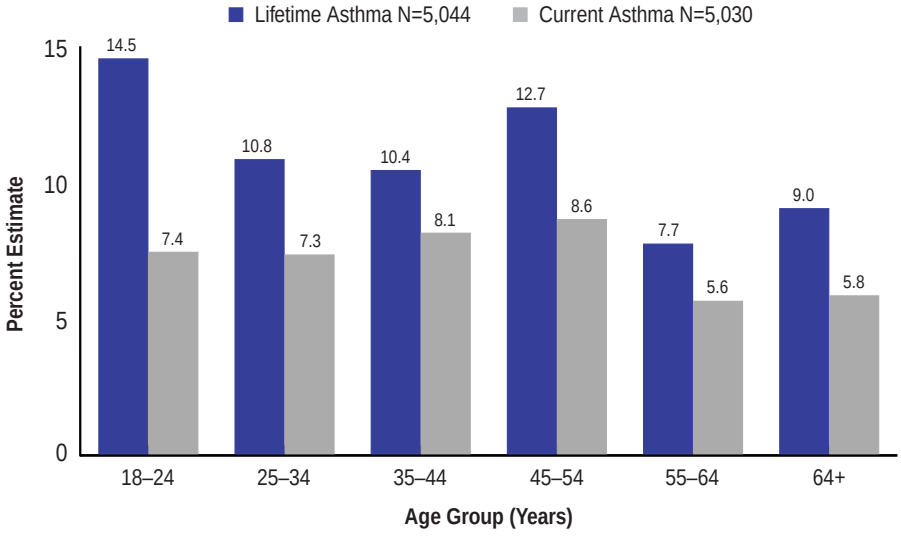


Source: *Health Statistics Section, Colorado Department of Public Health and Environment, October 2002.*

By Age Group

Lifetime asthma prevalence decreases as age increases. The 18–24-year-old group has the highest prevalence (14.5 percent), while those 65 and older have the lowest prevalence (9.0 percent). Current asthma prevalence is highest for 45–54-year-olds (8.6 percent), and lowest among those 65 and older (5.8 percent). However, differences by age group are not statistically significant.

Figure 7. Asthma Prevalence by Age: Colorado Adults, BRFSS 2000–2001

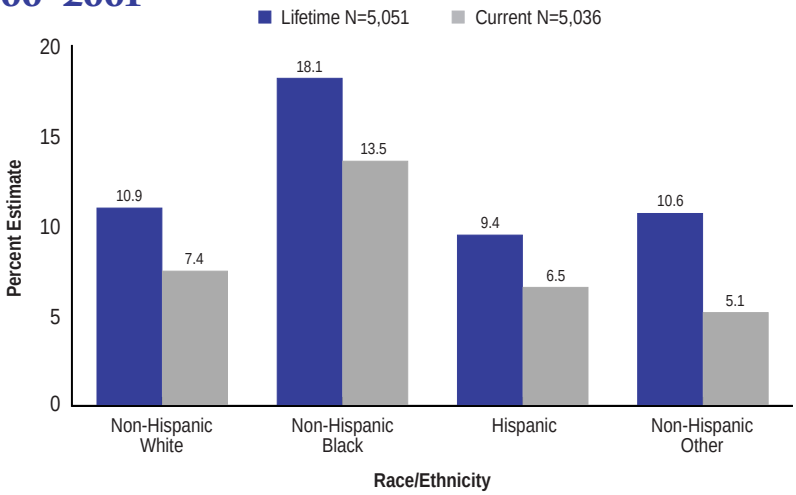


Source: *Health Statistics Section, Colorado Department of Public Health and Environment, October 2002.*

By Race/Ethnicity

Among Colorado adults who have ever been told they have asthma, blacks have the highest prevalence (18.1 percent), and Hispanics have the lowest prevalence (9.4 percent). However, differences by race/ethnicity are not statistically significant. Among Colorado adults who currently have asthma, blacks have the highest prevalence (13.5 percent), and non-Hispanics of race "other" have the lowest prevalence (5.1 percent). However, differences by race/ethnicity are not statistically significant.

Figure 8. Asthma Prevalence by Race/Ethnicity: Colorado Adults, BRFSS 2000–2001

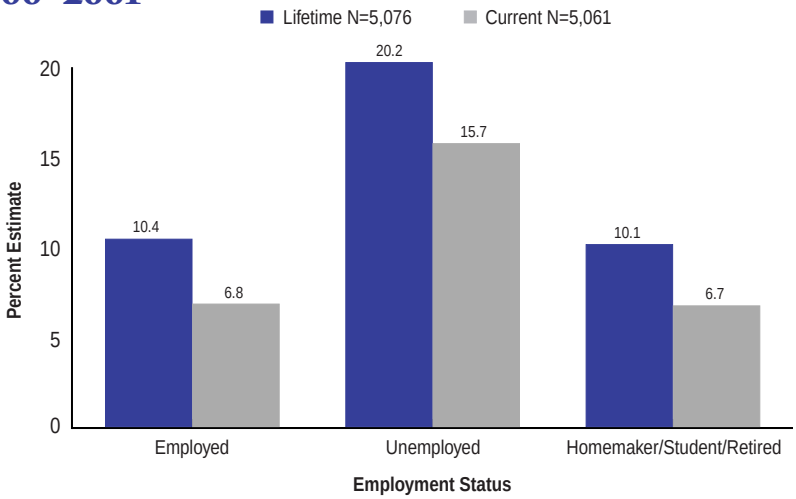


Source: *Health Statistics Section, Colorado Department of Public Health and Environment, October 2002.*

By Employment Status

The lifetime prevalence of asthma for those who are employed, homemakers, students, or retired is approximately 10 percent. The prevalence for those who are unemployed is twice as high (20.2 percent). Current asthma prevalence for those who are employed, homemakers, students, or retired is approximately seven percent. The prevalence for those who are unemployed is more than twice as high (15.7 percent).

Figure 9. Asthma Prevalence by Employment Status: Colorado Adults, BRFSS 2000–2001

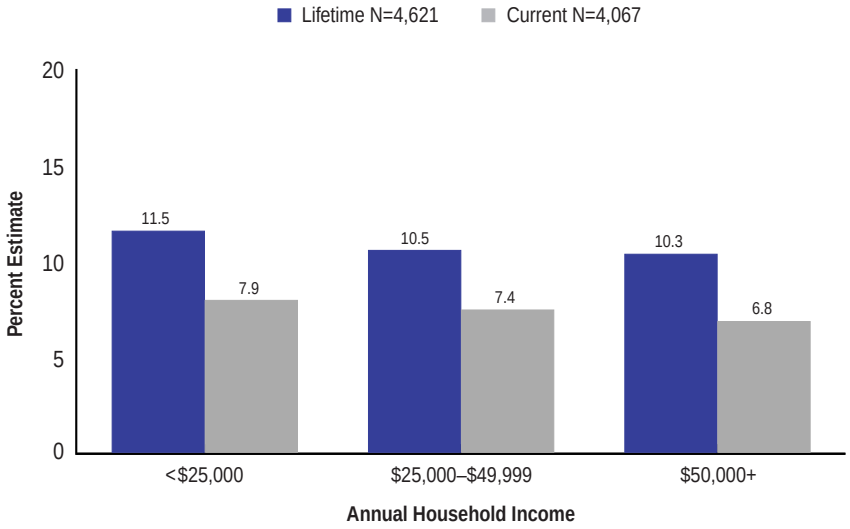


Source: *Health Statistics Section, Colorado Department of Public Health and Environment, October 2002.*

By Annual Household Income

The variations in the lifetime prevalence of asthma by annual household income are small, and the differences are not statistically significant. The variations in the prevalence of current asthma by annual household income are small, and the differences are not statistically significant.

Figure 10. Asthma Prevalence by Annual Household Income: Colorado Adults, BRFSS 2000–2001

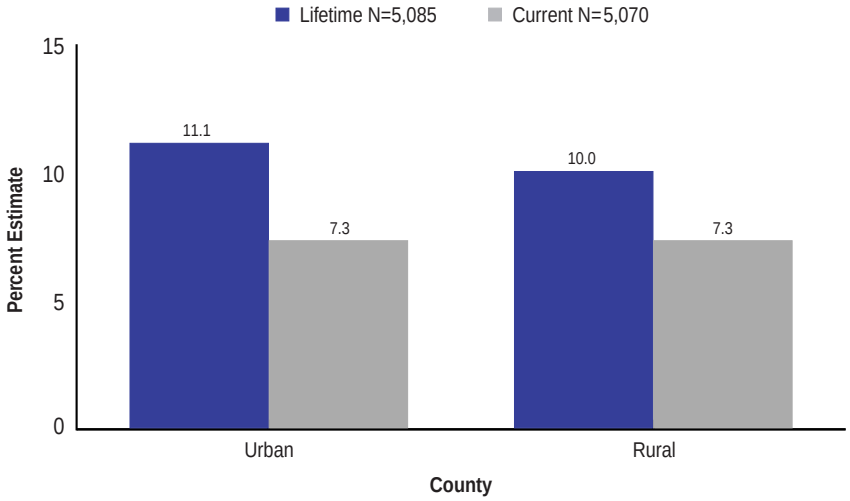


Source: *Health Statistics Section, Colorado Department of Public Health and Environment, October 2002.*

By Region

Lifetime prevalence of asthma does not vary substantially by geographic region in Colorado, nor does current asthma prevalence vary substantially by geographic region in the state.

Figure 11. Asthma Prevalence by Counties: Colorado Adults, BRFSS 2000–2001

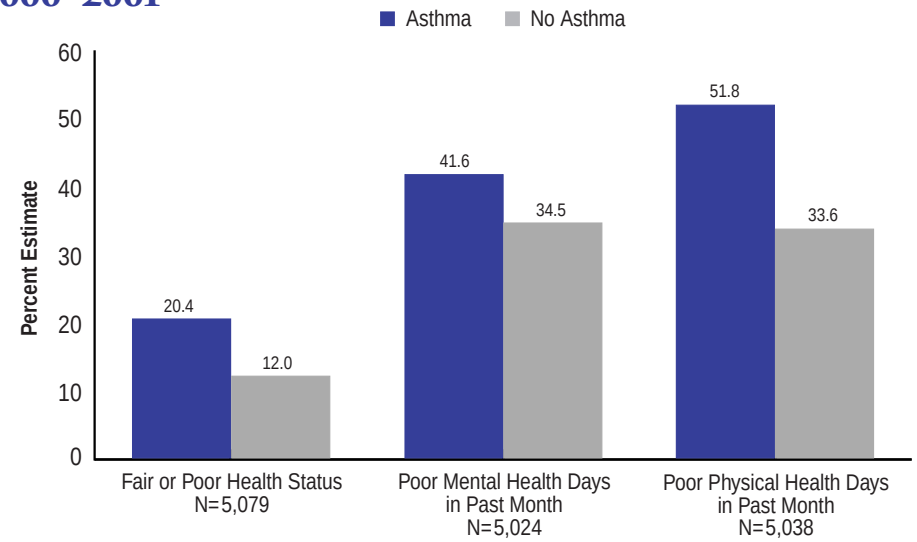


Source: *Health Statistics Section, Colorado Department of Public Health and Environment, October 2002.*

Health Status

Colorado adults who have ever been told by a doctor they have asthma are statistically significantly ($p \leq .05$) more likely to have fair or poor health status compared to those without asthma. In addition, compared to those without asthma, adults with asthma are 23 percent more likely to have had at least one poor mental health day in the past month, and 50 percent more likely to have had at least one poor physical health day in the past month. Colorado adults who currently have asthma are significantly more likely to have fair or poor health status compared to those without asthma. In addition, compared to those without asthma, adults with asthma are 30 percent more likely to have had at least one poor mental health day in the past month, and 67 percent more likely to have had at least one poor physical health day in the past month.

Figure 12. Prevalence by Asthma Status: Colorado Adults, BRFSS 2000–2001



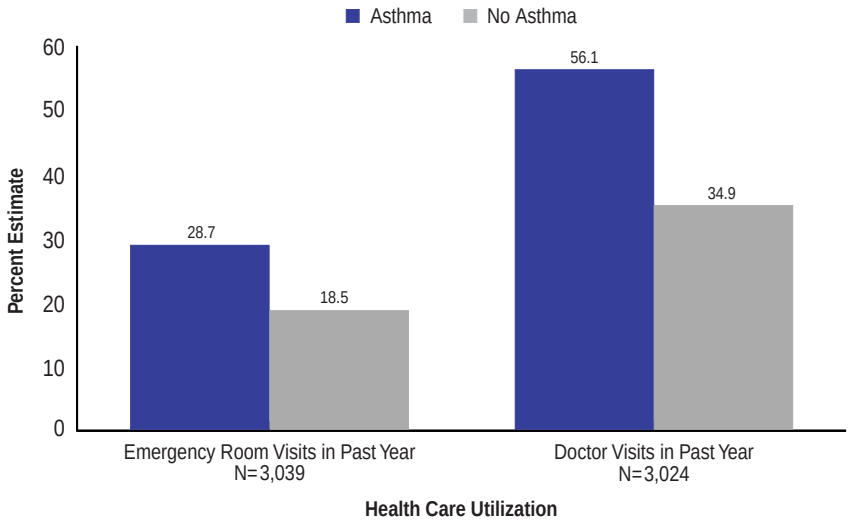
Source: *Health Statistics Section, Colorado Department of Public Health and Environment, October 2002.*

Prevalence Estimates—Lifetime Asthma

Health Care Utilization

One of the Healthy People 2010 Objectives is to reduce emergency department visits for asthma.[1] Compared to those who have never been told they have asthma, those who have are significantly more likely to have had an emergency room visit in the past year (18.5 percent and 28.7 percent, respectively). People with asthma are also significantly more likely to have had multiple doctor visits in the past year compared to those without asthma (56.1 percent and 34.9 percent, respectively).

Figure 13. Lifetime Asthma Status by Health Care Utilization: Colorado Adults, BRFSS 2000–2001



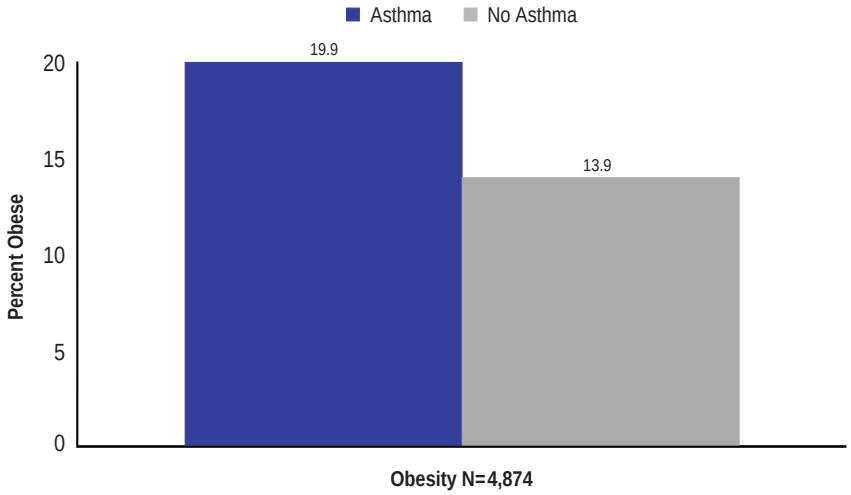
Source: *Health Statistics Section, Colorado Department of Public Health and Environment, October 2002.*

[1] *U.S. Department of Health and Human Services.* Healthy People 2010: Understanding and Improving Health. *2nd ed. Washington, D.C.: U.S. Government Printing Office, November 2000.*

Obesity

Obesity is defined as having a body mass index (BMI) of 30.0 or higher. The prevalence of obesity is more than 40 percent higher for those who have ever been told they have asthma compared to those who have not. The difference is statistically significant.

Figure 14. Lifetime Asthma Status by Obesity: Colorado Adults, BRFSS 2000–2001

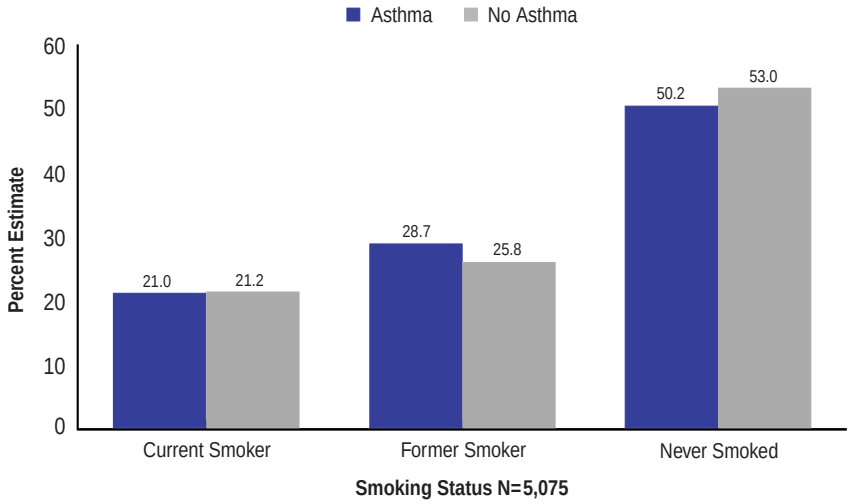


Source: *Health Statistics Section, Colorado Department of Public Health and Environment, October 2002.*

Tobacco Use

Cigarette smoking can trigger or worsen asthma and asthma symptoms. In Colorado, there is no statistically significant difference in smoking status for those with and without asthma. While 50 percent of people with asthma have never smoked, the percentage of non-smokers without asthma is only slightly higher, at 53 percent.

Figure 15. Lifetime Asthma Status by Smoking Status: Colorado Adults, BRFSS 2000–2001*



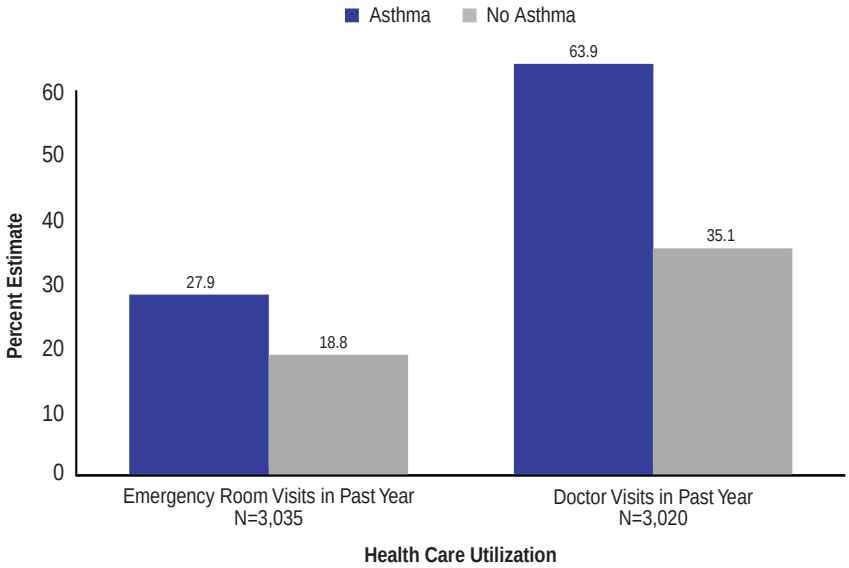
Source: *Health Statistics Section, Colorado Department of Public Health and Environment, October 2002.*

Prevalence Estimates—Current Asthma

Health Care Utilization

Nationwide, for all age groups, approximately 11.3 million doctor visits were made due to asthma in 2001.[2] Compared to Colorado adults who do not have asthma, those adults currently with asthma are significantly more likely to have had three or more doctor visits in the past year (35.1 percent and 63.9 percent, respectively).

Figure 16. Current Asthma Status by Health Care Utilization: Colorado Adults, BRFSS 2000



Source: *Health Statistics Section, Colorado Department of Public Health and Environment, October 2002.*

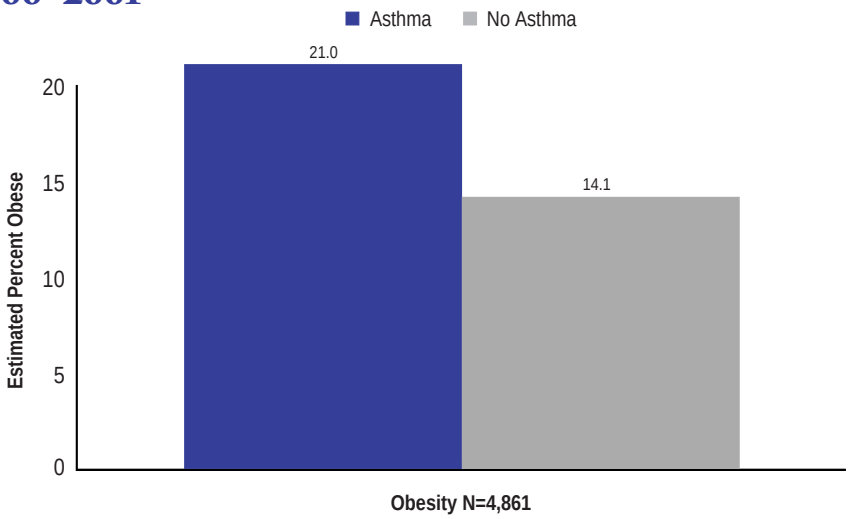
[2] *National Center for Health Statistics. "Ambulatory Care Visits to Physicians' Offices, Hospital Outpatient Departments, and Emergency Departments: United States, 1996.* Vital and Health Statistics *13(134), 1998.*

** The questions asked in the BRFSS about asthma and smoking only address the proportion of people with asthma that smoke tobacco and do not allow an assessment of whether smoking by people with asthma has affected the severity of their asthma. It also does not allow assessment of whether exposure to passive smoke has acted as a trigger for asthmatic attacks. This applies to data shown in Figure 15 on page 22 and also in Figure 18 on page 24.*

Obesity

Obesity is defined as having a body mass index (BMI) of 30.0 or higher. The prevalence of obesity is almost 50 percent higher for those who currently have asthma compared to those who do not, a significant difference.

Figure 17. Current Asthma Status by Obesity: Colorado Adults, BRFSS 2000–2001

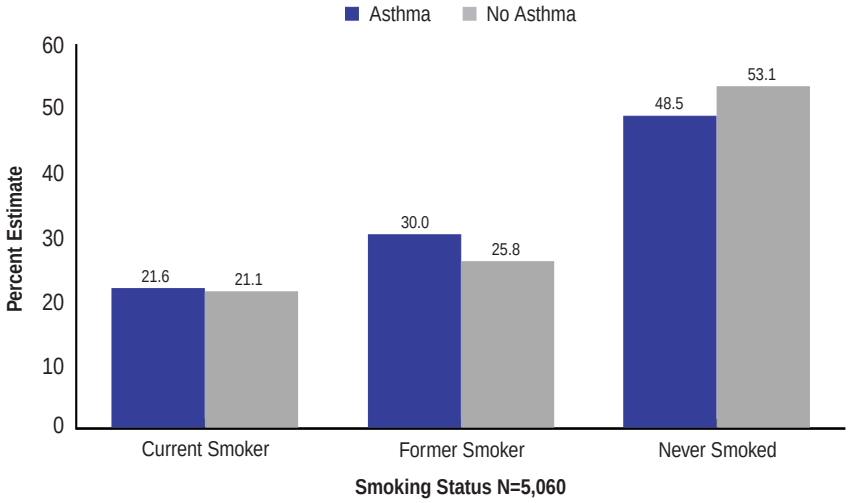


Source: *Health Statistics Section, Colorado Department of Public Health and Environment, October 2002.*

Tobacco Use

Cigarette smoking can trigger or worsen asthma and asthma symptoms. In Colorado, there is no statistically significant difference in smoking status for those with and without asthma. While 48.5 percent of people currently with asthma have never smoked, the prevalence among those without asthma is only slightly higher, at 53.1 percent.

Figure 18. Current Asthma Status by Smoking Status: Colorado Adults, BRFSS 2000–2001*



Source: *Health Statistics Section, Colorado Department of Public Health and Environment, October 2002.*

Table 6. Ever Had Asthma by State, County, and Planning and Management Region, Colorado BRFSS 2000–2001

	SAMPLE SIZE	PERCENT ESTIMATE	95% CONFIDENCE INTERVAL LOWER LIMIT	UPPER LIMIT
Colorado	5,085	10.9*	9.9	11.9
Adams	304	13.1	8.5	17.7
Arapahoe	392	10.6	7.1	14.2
Boulder	238	12.6	7.1	18.0
Chaffee	109	7.2	1.0	13.3
Denver	468	14.7	10.6	18.8
Douglas	134	14.4	6.9	21.9
El Paso	438	11.9	8.4	15.4
Fremont	260	13.5	4.7	22.3
Garfield	52	14.6	6.4	25.4
Jefferson	502	11.5	8.2	14.9
Lake	60	2.6	0.1	8.1
Larimer	255	10.4	5.9	14.8
Logan	173	5.0	0.5	9.4
Mesa	117	10.4	4.3	16.4
Morgan	248	12.8	2.4	23.1
Park	61	12.1	5.2	21.4
Phillips	57	4.8	0.8	11.8
Pueblo	134	11.7	4.6	18.8
Teller	129	8.4	2.0	14.9
Washington	56	14.5	0.6	28.5
Weld	160	10.3	4.0	16.6
Yuma	100	9.1	3.3	14.8
PMR 1	659	5.7	2.5	12.5
PMR 5 & 6	92	9.5	4.0	21.0
PMR 9	78	6.8	2.6	16.5
PMR 10	90	10.1	4.9	19.6
PMR 12	115	10.1	5.1	19.0
PMR 13	444	10.2	5.1	19.4

**10.9 percent is equal to more than 340,000 Colorado adults.*
Prepared by the Health Statistics Section, Colorado Department of Public Health and Environment, October 2002.

The respondents to the question "Have you ever been told by a doctor, nurse, or other health professional that you had asthma?" are sorted by county. Where the number of respondents was too small to report in that manner, counties were combined into their appropriate planning and management region (PMR). Please see the PMR map on page 10.

Table 7. Current Asthma Prevalence by State, County, and Planning and Management Region, Colorado BRFSS 2000–2001

	SAMPLE SIZE	PERCENT ESTIMATE	95% CONFIDENCE INTERVAL LOWER LIMIT	UPPER LIMIT
Colorado	5,030	7.8*	6.8	8.8
Adams	303	9.9	5.6	14.2
Arapahoe	391	6.6	3.7	9.5
Boulder	238	12.6	7.1	18.0
Chaffee	108	3.5	0.3	6.7
Denver	468	9.7	6.2	13.2
Douglas	134	10.2	4.0	16.4
El Paso	435	6.3	3.7	8.9
Fremont	260	8.2	1.6	14.8
Garfield	52	8.1	2.3	17.0
Jefferson	501	8.3	5.5	11.1
Lake	59	2.5	0.1	8.0
Larimer	255	7.8	3.8	11.8
Logan	172	4.3	0.0	8.6
Mesa	117	9.3	3.5	15.1
Morgan	247	9.4	0.0	18.8
Park	61	12.3	5.3	21.6
Phillips	56	1.1	0.1	5.5
Pueblo	134	8.7	2.6	14.8
Teller	129	6.7	0.5	12.9
Washington	56	13.7	0.0	27.4
Weld	159	6.0	1.7	10.3
Yuma	100	6.5	1.6	11.4
PMR 1	656	4.3	1.6	11.2
PMR 5 & 6	91	7.1	2.3	19.8
PMR 9	78	2.9	0.9	9.7
PMR 10	90	7.8	3.4	16.8
PMR 12	115	8.4	4.0	16.8
PMR 13	442	5.6	2.3	12.8

**7.8 percent is equal to more than 250,000 Colorado adults.*
Prepared by the Health Statistics Section, Colorado Department of Public Health and Environment, January 2003.

The respondents to the question "Do you still have asthma?" are sorted by county. Where the number of respondents was too small to report in that manner, counties were combined into their appropriate planning and management region (PMR). Please see the PMR map on page 10.

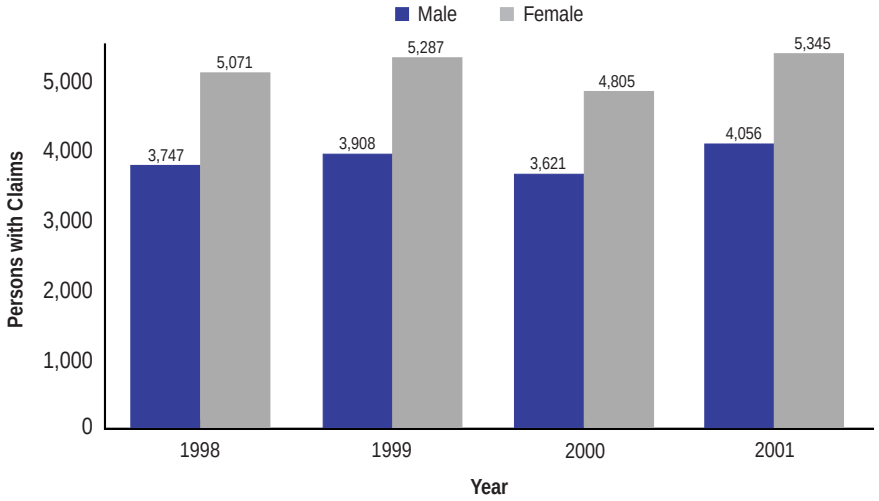
Medicaid Data

These data come from a table in the Medicaid claims database that combines all claim types. The table includes a recipient identification variable that can be linked to client files for additional information about the client. It also includes gender, age, date of birth, date of service, principal diagnosis, and many additional variables that describe the service and claims process for the claim. The database is designed primarily for tracking claims, so there are limitations to its use as public health data. For example, there may be multiple records for one claim as financial adjustments are made. Since one client could have multiple claims within one year, a count of recipient identification numbers where asthma was the primary diagnosis was performed. For this reason, it was decided that this database would be used to get a general sense of how many individuals with asthma as a primary diagnosis had health care services provided during a calendar year rather than to attempt to describe the number or types of services.

Medicaid data have great potential value, however, the data presented have significant limitations as described above. Accurate denominator data by demographic category were not available to use with the numerator data presented here. These data suggest that the diagnosis of asthma occurs more frequently in minority populations; however that conclusion cannot be made without proper denominator data. It is likely that minorities are over-represented in the Medicaid population, which could account for the increased proportion of asthma diagnoses for those groups. The Medicaid population is, nonetheless, an important barometer for the effectiveness of public health interventions. The fragile nature of recipients' existence makes addressing their health concerns and resolving the problems within the system, paramount.

The numerator data suggest what other data sources suggest: there is a predominance of asthma diagnoses in females in the general population; however, it is possible that there is a female predominance in the Medicaid population due to a focus on enrolling eligible pregnant women. Therefore, denominator data by gender is needed in order to draw appropriate conclusions.

Figure 19. Persons with Medicaid Claims Where Asthma is Primary Diagnosis by Gender: Colorado Medicaid, 1998–2001



Source: *Health Statistics Section, Colorado Department of Public Health and Environment, June 2003.*

The Medicaid population seems to reflect a similar tendency toward a higher proportion of females as opposed to males diagnosed with asthma as seen in other data in this report. When looking at the number of people of both genders with asthma in the Medicaid population, aside from a drop in 2000, the trend appears to be upward in the four years analyzed. Interpretation of the trends in these data are limited by the lack of denominator data for the Medicaid population.

Table 8. Persons with Medicaid Claims Where Asthma is Primary Diagnosis by Race and Gender: Colorado Medicaid 1998–2001

RACE/GENDER	1998	1999	2000	2001
All Races	8,818	9,195	8,426	9,401
Hispanic	2,465 (28.0%)	2,655 (28.9%)	2,389 (28.4%)	2,765 (29.4%)
White	4,778 (54.2%)	4,889 (53.2%)	4,584 (54.4%)	4,985 (53.0%)
African American	702 (8.0%)	808 (8.8%)	704 (8.4%)	808 (8.6%)
Unknown	672 (7.6%)	655 (7.1%)	576 (6.8%)	650 (6.9%)
Male	3,747 (42.5%)	3,908 (42.5%)	3,621 (43.0%)	4,056 (43.1%)
Female	5,071 (57.5%)	5,287 (57.5%)	4,805 (57.0%)	5,345 (56.9%)

Source: *Health Statistics Section, Colorado Department of Public Health and Environment, June 2003.*

In year 2000, demographic statistics for all of Colorado showed that whites represented 74.5 percent of the population, Hispanics 16.7 percent, and African Americans 4.3 percent. This table shows that for year 2000, African Americans were twice as likely to be represented in the Medicaid population of people with asthma in comparison to their proportion of the population. Hispanics showed nearly the same overrepresentation. These are numerator data and so must be interpreted with caution, as minorities may be over represented in the Medicaid population in Colorado. The relatively high percentage of unknown ethnicity should be noted.

Children and Youth Data

Breathe Easy Asthma Management (BEAM) Project and Elementary School Screening

BEAM is a grant-funded activity that provides asthma management and education to a group of elementary school children in Adams County School District 50 in Westminster, Colorado. This project has worked collaboratively with the Breathe Better Foundation, that is housed at Colorado Allergy and Asthma Centers, P.C. to perform a survey questionnaire and peak flow screening in 11 of the district's elementary schools. This section reports on data available from these efforts. Data analysis was provided by Monica Federico, MD, a Pediatric Pulmonary Fellow working in collaboration with the Colorado Outcomes Group at the University of Colorado Health Sciences Center.

The school screening had the objective of determining the proportion of children with asthma in poor control by virtue of a parental survey in conjunction with a free running test, wherein children were given peak flow tests before and after running. Diagnosis of asthma was based on the following:

- Parental reports of history of prior asthma diagnosis;
- A positive survey response defined by National Asthma and Education and Prevention Program (NAEPP) guidelines: weekly or monthly cough AND weekly or monthly wheeze or chest tightness AND cough, chest tightness or wheeze with exercise, or fumes, or dust or animal exposure; and.
- Positive Free-Running Test (FRT): drop in peak flow of greater than or equal to 15 percent or wheeze reported after exercise or albuterol given after exercise.

Poor control was defined as "diagnosis" of asthma and weekly cough or wheeze reported on the survey.

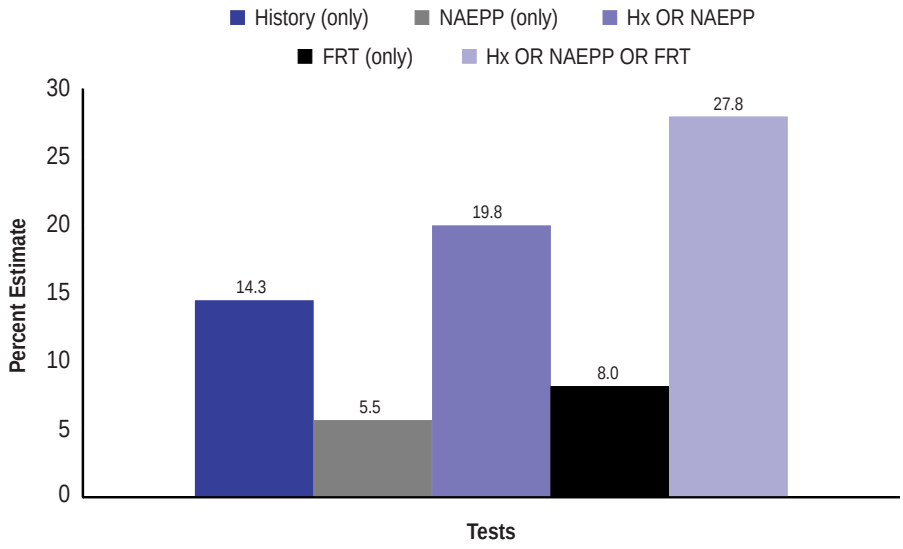
Fifty-three percent of children in the 11 schools were screened by survey or FRT after parental consent. The total number screened was 1,748. Ethnicity and gender of the sample differed from that of the district at large as shown in Table 9 on the following page. Prevalence of asthma by ethnicity was 6.2 percent in Hispanics, 5.5 percent among Asians and 6.0 percent in whites. The number of African Americans was too small to be evaluated. An interesting differential is present among Hispanics in that asthma prevalence was 5.0 percent among English speaking children and only 1.3 percent among those with Spanish-only skills.

Table 9. Characteristics of the BEAM Study Population and the School District (N=1,748)					
	GENDER % FEMALE	AGE (YEARS)	RACE	PCP % WITH PCP	LANGUAGE (% ENGLISH)
Number	1,718		1,427	801	1,728
Sample	53%*	8.4	Latino 49% White 27%* Asian 3%* Black 1%*	72.9*	80%
District	49%		Latino 50% White 37% Asian 9% Black 2%		

**The sample is significantly different than the district with more females (p<0.001), fewer blacks (p=0.003), fewer whites (p<0.0001), and fewer Asians (p<.0001).*

The mode of diagnosis is shown in Figure 20. Using National Asthma and Education and Prevention Program (NAEPP) criteria, there was an increased prevalence of asthma, from 14.3 percent to 19.8 percent based on parent history of a prior diagnosis of asthma. Adding Free-Running Test (FRT) to the analysis, prevalence increased even more to 27.8 percent. Age, race, gender, grade level, or access to a primary care provider did not predict symptoms in relation to a diagnosis of asthma.

Figure 20. BEAM Percent Asthma Prevalence (N=1,493)



Children diagnosed previously or by the survey were more likely to be in poor control (24 percent) than those diagnosed by Free-Running Test (FRT) alone (eight percent). Here again, neither demographics nor access to a primary care provider predicted poor control or being on controller medications such as corticosteroids. However, children with a prior diagnosis of asthma and with access to a primary care provider were more likely to be on some type of asthma medication. Hispanics were significantly less likely to be on a controller medication than other groups (X^2, $p = 0.02$).

These findings are intriguing in that the screening has identified a higher prevalence of asthma than expected. The significance of this finding is not clear at the moment, especially given the apparently lower proportion of children with asthma in poor control in the FRT only group. Future directions might include these questions:

- What are the differences among the three groups?
  —Prospective, concurrent collection of health care utilization and quality of life data are needed to answer this question.
- Do screening results lead families to follow-up with a health care provider?
  —A prospective, randomized controlled trial may be needed.

Avenues for the Future

Emergency Department Data

Although hospitalization data provide a good look at some of the more severe asthma cases, a population of less severe cases with a high potential for better management, are those cases found in emergency departments. Currently there is no system for accurately tracking cases that are only seen in the emergency departments.

Clearly these cases are usually acute and the assumption can be made that they predominately represent poorly managed people with asthma. However, they also include several other groups. They include children with asthma with single parents who often can't get their children to a doctor during the day. They include people with asthma who don't have health care and only go to the medical community for assistance when they absolutely must. They include individuals who have never been diagnosed with asthma and who are in distress for the first time. They include people who normally have their asthma under control but have an acute event for reasons out of their control.

The development of an effective protocol for appropriately diagnosing and recording asthma in the emergency departments is needed. The development of a mechanism by which the data could then be shared with the Colorado Department of Public Health and Environment where it could be collected, aggregated, and disseminated to partners, researchers, and interested organizations, would be the next step. A series of yearly reports of the aggregated data in a format compatible with those developed at the national level or in concert with other states engaged in similar surveillance, would then give us the ability to show a pattern for Colorado, as well as comparing rates with other states, much like is being done with the Behavioral Risk Factor Surveillance Survey data currently.

Population-Based Prevalence Data

The initial goal of the CDC asthma grant, upon which the state asthma program is based, was to create a population-based surveillance system. The past three years of experience have shown that that goal is easier said than done. However, the goal has never been released.

It is believed that if data from several sources in the Denver Metropolitan area can be obtained, that this will provide a representative sample of the largest Colorado population center. Although this will only be a start toward a true population-based system, it will be a very important one. It will provide the most racially and ethnically diverse population, a population with the most broad socio-economic diversity, as well as, a population with wide variations in disease severity.

The two data sources that are being most actively pursued at this time are Kaiser Permanente and Denver Health and Hospitals. The former is a large HMO in the Denver area that has a sophisticated asthma management plan and built-in incentives regarding pharmaceutical purchases that virtually guarantee that patients who receive a prescription from a Kaiser doctor, will fill the prescription at a Kaiser pharmacy. The latter is the largest single hospital in the metro Denver area, including a number of community health clinics. It is a level one trauma center and is the primary indigent care provider in the area. This virtually insures a broad ethnic and racial representation as well as a representation of the full range of the socio-economic status spectrum.

To be representative of the entire state and a more full range of disease severity, data will need to be acquired from rural hospitals and HMO's, hospitals and private clinics with the most severe asthmatic cases, and potentially other clinical sources.

Children and Youth Data

Initially the goal of the CDC asthma grant, upon which the state asthma program is based, was to look at asthma in children younger than 18 years of age. It became apparent in early grant work that it was more practical and efficient to gather and analyze data regarding people with asthma of all age groups.

One of the reasons this became clear was due to the obvious lack of data on children with asthma. Particularly difficult to find was broad-based data that could be used as prevalence data for the state or even the Denver Metropolitan area. Several potential sources have been subsequently identified. Kaiser Permanente and Denver Health and Hospitals described in the previous paragraph are strong candidates for data providers. The Department of Health and Environment has joined work on the Colorado Child Health Survey that will be a random digit dialing telephone survey, similar to the Behavioral Risk Factor Surveillance System. It will give us prevalence data for children 0–12 years of age.

The State Asthma Program, in collaboration with the Colorado Asthma Coalition, have distributed a survey, reviewed earlier in this document, to school nurses statewide. It is anticipated that this effort will continue to provide a limited understanding of the extent of asthma in school aged children.

Environmental Data

Colorado represents an unusual set of environmental circumstances. The combination of high altitude and low humidity presents challenges to understanding asthma in the state.

Projects at the Colorado Department of Public Health and Environment are attempting to understand the links between ambient air pollution and hospitalizations for asthma in the Denver Metropolitan Area and the southeastern corner of the state are looking at particulates, ozone, and other known urban and rural pollutants. These data will be reported in the near future.

Studies looking at indoor air are potential collaborations with scientists at the Colorado State University.

African Americans

Mortality data, hospitalization data, and data from the Behavioral Risk Factor Surveillance System all show that this community suffers disproportionately from asthma. Data from a recent set of focus groups in the community involving children with asthma, adults with asthma, and parents of children with asthma will be published in the near future.

These data will help the Colorado Department of Public Health and Environment and the Colorado Asthma Coalition to better understand the perceptions the community has regarding asthma, as well as which interventions are successful and which are unsuccessful in reducing the negative impacts of asthma on quality of life, lost school and work days, and physical activity levels.

Additional focus groups and collaborations with researchers and care providers promise greater insight into the needs of the community.

Notes:

Colorado Department
of Public Health
and Environment

4300 Cherry Creek Drive South ▲ Denver, Colorado 80246-1530
Asthma Program ▲ Prevention Services Division

http://www.cdphe.state.co.us/ps/asthma/asthmahom.asp