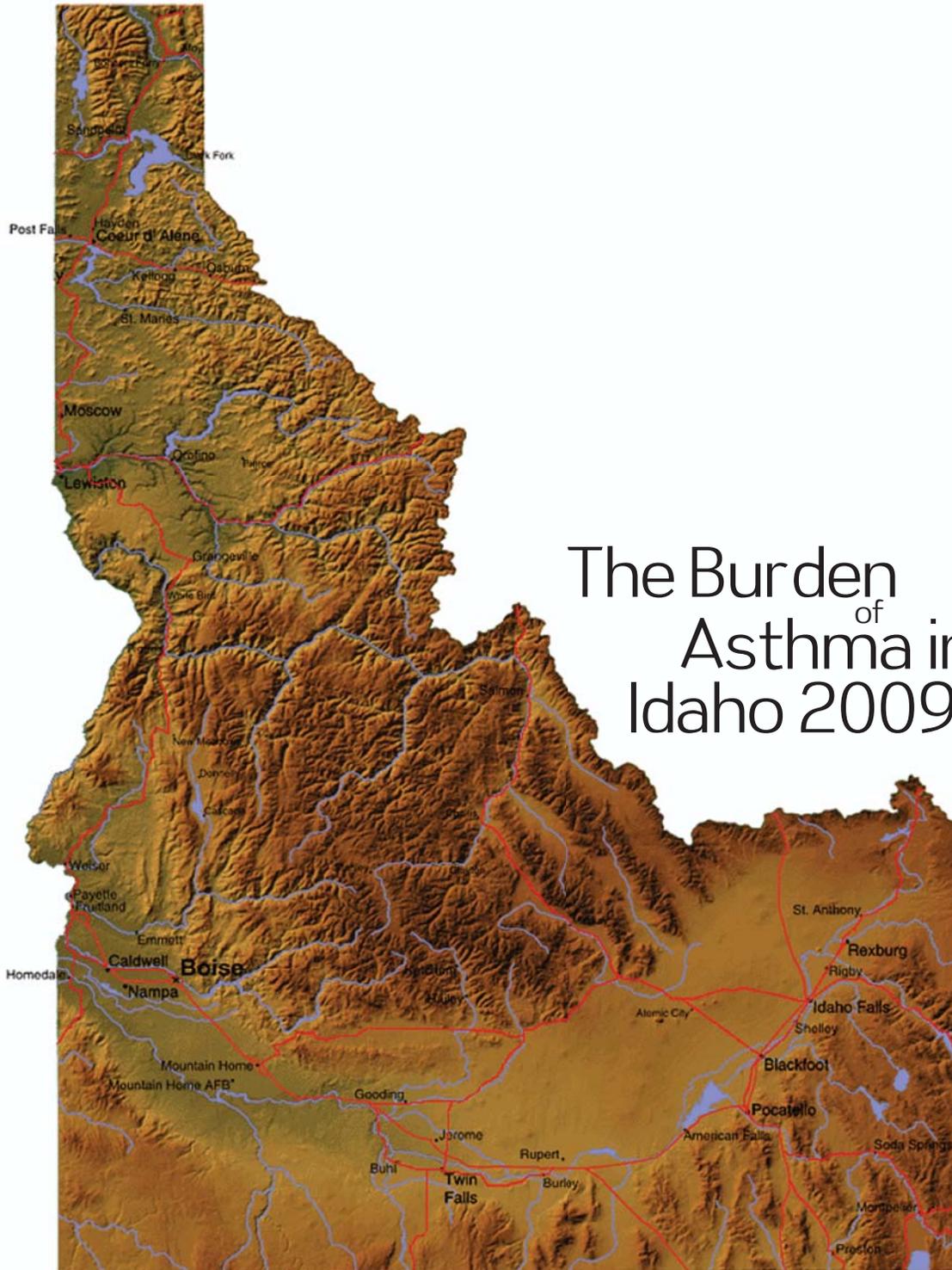




Idaho Asthma Prevention and Control Program
Bureau of Community and Environmental Health
Division of Health
Idaho Department of Health and Welfare



The Burden of Asthma in Idaho 2009



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This epidemiological publication was supported by Cooperative Agreement Number CDC-RFA-EH07-701 from the Centers for Disease Control and Prevention (CDC). Its contents are solely the responsibility of the contributors and do not necessarily represent the official views of the CDC.

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Suggested Citation:

Pollard J, Graff R, Mauerman N, Newby T, Miller J, Smart I. *Idaho Asthma Burden - Epidemiology of Asthma in Idaho*. Idaho Asthma Prevention and Control Program. Bureau of Community and Environmental Health, Idaho Division of Health, Idaho Department of Health and Welfare, 2008.

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For online information about Asthma in Idaho please visit: <http://www.idahoasthma.org>

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Executive Summary

Asthma affects persons across all age-groups, but often symptoms begin in childhood. In the United States, roughly 22 million people have been diagnosed with asthma (nearly six million of these being children). In Idaho, it is estimated that 104,000 children and adults currently have asthma, and recent increases in asthma prevalence seem to coincide with worsening air quality conditions throughout the state, particularly in areas with the densest population. Idaho residents living in more urban areas, or areas in the near vicinity of industries emitting pollutants known to exacerbate asthma, may be at higher risk for asthma morbidity.

The Idaho Asthma Prevention and Control Program (IAPCP) has established an asthma surveillance system in order to better define and track the burden of asthma in Idaho. Analysis of survey data from the Idaho Behavioral Risk Factor Surveillance System (BRFSS) provides some clues as to the severity of asthma among those reporting to have current asthma. Using severity classifications based on frequency of self-reported symptoms (day and night), inhaler use during attacks, and activity limitations, it appears that the majority of Idaho adults (estimates range from 68% upward) would be classified as having the milder 'intermittent' form of asthma. Increases in the proportion of adults with milder forms of asthma might indicate successful programming efforts in asthma management.

Asthma mortality in Idaho is highest among those over age 65. While Idaho's overall age-adjusted asthma mortality rates tend to mirror U.S. age-adjusted asthma mortality rates, in 2005 Idaho had the 5th highest asthma mortality rate in the nation. As death from asthma is almost entirely preventable and given the apparently high proportion of asthma sufferers with 'intermittent' severity, Idaho's asthma mortality rate is of particular concern. A better understanding of who is dying and under what circumstances will be important in elucidating ways to reduce the state's overall asthma mortality rate.

Ample opportunity for education in asthma management exists, both for patients and providers, as a high proportion of asthma sufferers are not being seen for routine asthma checkups, continue to smoke, and are in need of annual flu vaccinations and lifetime pneumococcal vaccinations. Additionally, more work needs to be done with schools to ensure that all children have a school-based asthma action plan. A positive sign of successful asthma management may be that increasing numbers of asthma sufferers report participating in leisure time physical activity.

Despite our increasing knowledge of how asthma impacts Idaho, numerous gaps remain. The most significant gaps which have been identified by the IAPCP include:

- Provider education for diagnosis of asthma and doctor to patient education
- Lack of information about capacity and utilization of asthma self-management education
- Lack of statewide comprehensive hospital discharge data
- Lack of community- or neighborhood-level asthma prevalence data
- Lack of adult and child patient medication usage data
- Lack of knowledge/data to better understand the asthma-related disparities among Idaho's American Indian population
- Lack of data addressing burden of work-related asthma in Idaho

While our understanding of asthma's impact in Idaho is increasing, it remains incomplete. Continuing efforts to build our data infrastructure will be critical for improved understanding and development of interventions to reduce asthma morbidity and mortality in Idaho.

Key Findings

Asthma Prevalence

Adult Prevalence

In 2007, an estimated 13% of Idaho adults (aged 18 and older) reported ever having been told by a doctor they had asthma, while 8.7% currently have asthma. That translates to an estimated 143,000 adults with a history of asthma and 94,000 adults who currently have asthma.

Based on self-reported asthma prevalence rates collected via the Idaho BRFSS, women in Idaho are significantly more likely to have current asthma than men. (11% and 7% respectively in 2007).

Compared with White adults (8%) in Idaho, American Indians (13%) have the highest asthma prevalence, while Asian (2%) and African American (4%) adults have some of the lowest rates of current asthma.

Youth Prevalence

According to results of the BRFSS survey, 1 in 14 (7%) children (under age 18) in Idaho currently have asthma, and according to the Idaho Youth Risk Behavior Survey (YRBS) nearly 1 in 5 (19%) high school students in Idaho has been diagnosed with asthma at some point during their lifetime.

Results of the 2003-2004 National Survey of Children's Health indicate that the impact and severity of asthma among Idaho children is substantially less than the U.S. as a whole. Among Idaho children, 5% are affected by asthma (compared to 8% nationally) and 12% of children's asthma has a great or medium impact on the family (compared to 16% nationally).

Asthma Symptoms

Nearly 1 in 3 Idaho adults (30%) with current asthma reported having asthma symptoms more than twice a week during the previous month, and over half (59%) of adults with current asthma experienced an asthma attack in the previous year.

Roughly 1 in 4 Idaho adults (23%) with current asthma reported the need to use an inhaler to control their asthma on five or more days during the previous month.

Quality of Life

From 1999 to 2006, Idaho adults who reported current asthma were significantly more likely than adults without current asthma to report their general health as fair or poor (29% and 14% respectively in 2007).

Each year, roughly 20% of Idaho adults with current asthma report visiting a health professional because of their worsening asthma, and over 10% of Idaho adults with current asthma visited an emergency room because of their asthma.

Asthma Management

Public School Asthma Action Plans and Asthma Awareness Training

The proportion of schools with a school-based asthma action plan for all of their students with asthma decreased greatly from 54% in 2004 to 43% in 2006. The good news is that while 16% of health educators in Idaho high schools received training on asthma awareness in the two years prior to being surveyed, 54% of health educators surveyed said they would like to receive training on asthma awareness.

Self-Management

Only 19% of Idaho adults with current asthma had the recommended number of routine asthma checkups (i.e. two in the past year)

Roughly half (46%) of adults with current asthma had an influenza vaccination in the past year, and just over 1 in 3 adults (39%) with asthma have had a pneumococcal vaccination during their lifetime.

Idaho data show that there have been no significant changes over time for most of the surveillance measures associated with asthma self-management; specifically routine asthma checkups, medication use, annual influenza and lifetime pneumococcal vaccination.

Risk Factors

Idaho adults with current asthma are just as likely to smoke as adults without asthma (18% and 19% respectively), which suggests that people with asthma continue to smoke despite their asthma diagnosis and the likely negative impact that cigarette smoking has on their asthma symptoms.

Ten percent of obese adults in Idaho have current asthma; slightly higher than the 8% of not obese adults who have current asthma.

Environmental Exposures

Adults who report mold (in an amount larger than a dollar bill) in their home (9%) are significantly more likely to have current asthma than those who do not report the presence of mold in their homes (4%).

Since 1999, four of Idaho's five most populated counties (there are 44 counties in Idaho) have regularly exceeded Environmental Protection Agency guidelines for ozone and particulate matter.

Asthma Mortality

Between 2002 and 2006, the average annual number of deaths due to asthma in Idaho was 19, with a peak number of 24 asthma deaths in 2005.

In 2005 (the most recent year U.S. data are available), Idaho's age-adjusted asthma death rate of 1.8 per 100,000 persons is slightly higher than the U.S. asthma death rate of 1.3 per 100,000 population; and, according to CDC Wonder, Idaho had the 5th highest ranking asthma mortality rate in the Nation.

Economic Costs Associated with Asthma

In 2005 (the most recent year complete Idaho Medicaid asthma claims data were available), the cost of asthma-related Medicaid claims was \$6,169,926.

Introduction

Asthma is a disease that affects the respiratory system by episodes of bronchoconstriction (the constriction of muscles around the airways within the lungs) and inflammation of the bronchial airways. Asthma symptoms generally include wheezing, breathlessness, tightness of the chest, and coughing. Generally speaking, there are no specific causes or cures for asthma, however it is possible to minimize symptoms by knowing the warning signs of an attack, avoiding environmental asthma triggers (such as pet dander, tobacco smoke, etc.), and adhering to an asthma management plan developed by an appropriate health-care provider.

The actual burden of asthma is somewhat unclear in Idaho, since there is no reporting mechanism of asthma diagnoses. This lack of standardized reporting requires that other methods of surveillance be employed to assess asthma prevalence and risk factors in Idaho. Accessing hospital discharge data statewide, a potentially significant source of information on severe cases of asthma, is not yet an option in Idaho. This limits the description of asthma in Idaho to the analysis of self-reported surveillance data, Medicaid claims data, and the review of death certificate data.

Idaho does not currently administer the Asthma Call-Back Survey, which would provide a much richer collection of measures related to the burden of asthma in Idaho. The IAPCP continues to request approval to participate in the call-back survey, however at this time, Idaho Department of Health and Welfare (IDHW) administration has made the decision not to administer the call-back survey. The IAPCP understands the importance of acquiring the asthma call-back survey data for program planning and surveillance and will continue working towards obtaining approval to conduct the asthma call-back survey or developing a satisfactory alternative.

Despite these limitations, the available data indicate that asthma is not only a burden to many Idahoans young and old, but there is much room for improvement in the area of asthma self-management, asthma prevention policy, and asthma-awareness education (primarily among those individuals who teach, coach, and care for persons with asthma; as well as individuals with family members or friends who have been diagnosed with current asthma).

About this report:

For a list of the data sources, survey methodologies, and questionnaire content please see Appendices A and B.

For an explanation of confidence intervals (C.I.) please see Appendix B. Any difference between measures that is determined to be statistically significantly different through statistical testing may be preceded by the words “significantly” or “statistically.”

In 2007, the National Heart, Lung, and Blood Institute (NHLBI) released an updated version of the classification system for asthma severity as part of the *Expert Panel Report 3 (EPR-3): Guidelines for the Diagnosis and Management of Asthma*. Analyses of key asthma severity measures from the Idaho BRFSS were performed with these guidelines in mind.

The purpose of this report is to use all available (and reliable) data sources to describe the burden of asthma in Idaho and to provide baseline measures of the asthma burden in order to evaluate the effectiveness of asthma control efforts. Additionally, data used in this report are used for program planning, policy development, and for requesting asthma control funding.

Key Recommendations

One of the main objectives in developing the 2008 Asthma Burden Report was to identify needs relating to asthma control in Idaho and what programmatic efforts need to be taken in order to address those asthma related needs. Based on the information compiled in this report IAPCP has identified the following key recommendations:

1. Decrease asthma burden among adult females, persons over age 65, American Indians, and children (primarily to instill proper asthma self-management at an early age).
2. Address high asthma mortality rate among elderly Idahoans.
3. Identify and address gaps in asthma management among individuals.
4. Increase the number of schools in Idaho that utilize a school-based asthma plan.

Idaho Geography and Population

The state of Idaho is located in the Northwestern U.S. and has a population of approximately 1.5 million people. The state consists of 44 counties; a number of which are designated frontier counties based on a population density of less than 6 persons per square mile (see Figure 2). Of the 50 states, Idaho ranks 11th in land size with 82,751 square miles of land and ranks 39th in population. Idaho's population has increased from 1,293,953 in 2000 to 1,499,402 as of July 1, 2007. The increase from 2000 to 2007 of 13% was the 5th highest increase in the nation after Nevada (25%), Arizona (20%), Utah (14%), and Georgia (14%).

Public Health Districts

Idaho is divided into seven public health districts (PHDs), with each public health district containing four to eight counties (Figure 1). Each of the seven PHDs is an independent agency governed by a local board appointed by the county commissioners within the district. The PHDs work in close cooperation with the IDHW to provide an array of services.

Race/Ethnicity

The population of Idaho is comprised of many racial and ethnic groups, with the most prevalent groups listed below (with percent of state total and number of individuals):

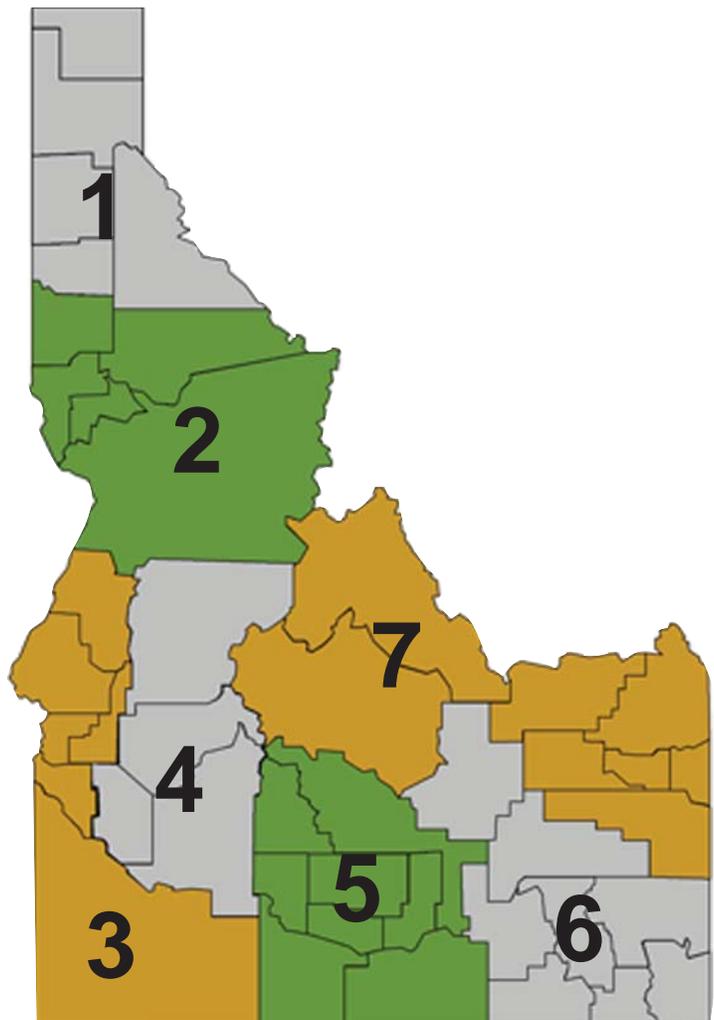
White - 96% (1,436,908)
American Indian - 2% (23,697)
Asian or Pacific Islander - 1% (21,943)
Black - <1% (16,854)

Non-Hispanic - 90% (1,351,976)
Hispanic - 10% (147,426)

2007 Idaho Public Health District Resident Population Sizes

- 1) Panhandle - 208,445
- 2) North Central - 102,388
- 3) Southwest - 243,156
- 4) Central - 418,778
- 5) South Central - 174,057
- 6) Southeast - 162,880
- 7) Eastern - 189,698

Figure 1.

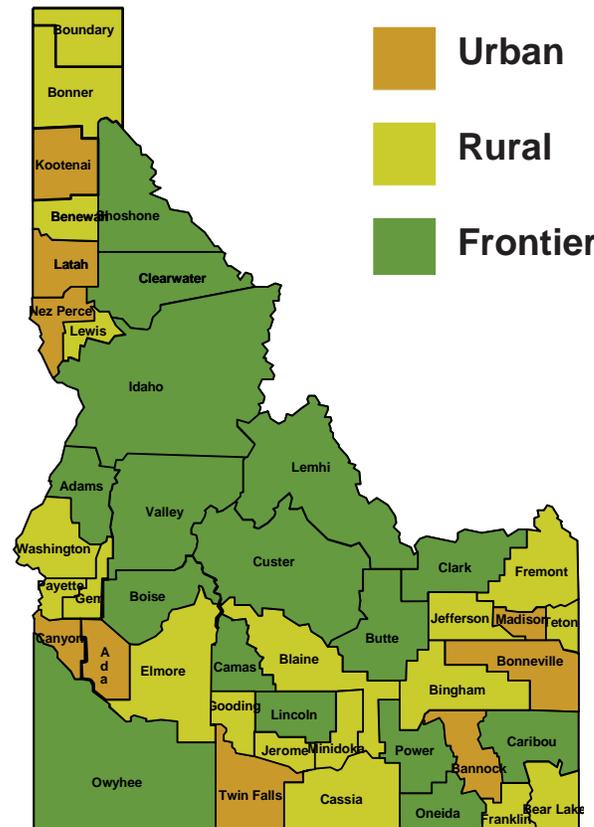


County Population Characteristics - Urban, Rural, and Frontier Designations

Among Idaho's 44 counties:

- 9 are designated **urban** based on having a population center of 20,000 persons or greater
- 19 are designated **rural** based on having a population density of 6 or more persons per square mile and no population center of 20,000 persons or greater
- 16 are designated **frontier** based on having a population density of less than 6 persons per square mile and no population center of 20,000 persons or greater

Figure 2.



Population Density Designations, 2006

Urban = 9 Counties

(Ada, Bannock, Bonneville, Canyon, Kootenai, Latah, Madison, Nez Perce, Twin Falls)

Rural = 19 Counties

(Bear Lake, Benewah, Bingham, Blaine, Bonner, Boundary, Cassia, Elmore, Franklin, Fremont, Gem, Gooding, Jefferson, Jerome, Lewis, Minidoka, Payette, Teton, Washington)

Frontier = 16 Counties

(Adams, Boise, Butte, Camas, Caribou, Clark, Clearwater, Custer, Idaho, Lemhi, Lincoln, Oneida, Owyhee, Power, Shoshone, Valley)

Asthma Prevalence in Idaho

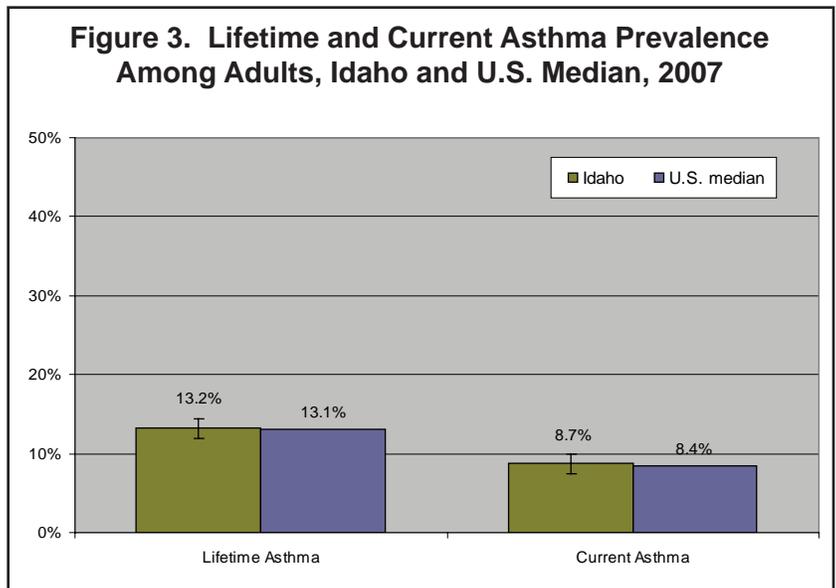
In Idaho, the prevalence of asthma among adults is estimated each year using self-reported responses to questions asked as part of the Idaho BRFSS survey. Asthma prevalence among Idaho youth is estimated through the Idaho BRFSS as well as the Idaho YRBS which is administered to Idaho public school students grades 9 through 12. (For methodological information see Appendix.)

Typically, asthma prevalence is reported as *lifetime asthma prevalence* and *current asthma prevalence* (with current asthma prevalence being the more commonly reported/utilized measure of asthma prevalence).

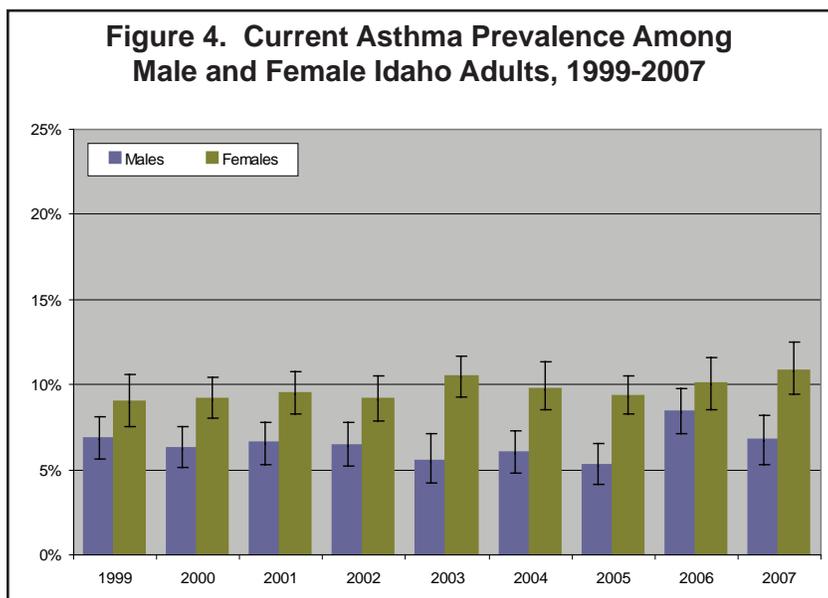
Adult Prevalence

Based on 2007 Idaho BRFSS estimates, 13% of adults (representing approximately 143,000 adults) report that they have been told they have asthma at some point in their lifetime, and 9% of adults (94,000) report they still have asthma (i.e. current asthma). Idaho asthma prevalence rates (both lifetime and current) continue to align closely with U.S. median asthma prevalence rates and based on 2007 estimates, do not differ significantly (see Figure 3).

Although Idaho’s adult current asthma prevalence did not differ significantly from the national median in 2007, asthma prevalence for males and females in Idaho did show statistically significant differences with adult females in Idaho having higher rates of current asthma than adult males (11% and 7% respectively). Although the differences between male and female current asthma rates have not always been statistically significant, they have differed statistically more times during the past nine years than they have not (see Figure 4).



Source: Idaho BRFSS, 2007



Source: Idaho BRFSS, 2007

In contrast, there do not appear to be any programmatically or statistically significant differences in adult current asthma prevalence by region (Idaho public health districts), age, income, population density (urban, rural, and frontier counties), or educational attainment.

Other disparities associated with current asthma in Idaho (see Figure 5 with 2005-2007 aggregate data) have been identified among various sub-populations; and there are statistically significant and/or programmatically significant differences based on race, ethnicity, and socio-economic status (SES). Adult American Indians (13%) have the highest asthma prevalence among racial groups in Idaho, while Asian (2%) and African American (4%) adults have some of the lowest asthma prevalence rates.

Based on results of aggregated 2005-2007 Idaho BRFSS data, Hispanic/Latino adults reported significantly lower prevalence of current asthma than non-Hispanic/Latino adults in Idaho (4% and 9% respectively). Although other states have reported similar differences between Hispanic/Latino adults and Non-Hispanic/Non-Latino adults, there are some inherent weaknesses in the BRFSS methodology which may result in lower prevalence numbers for Hispanic/Latino adults than are reported as part of the BRFSS.

In order to obtain reliable estimates of current asthma among certain sub-populations and age-groups, three years of Idaho BRFSS data were aggregated for the table below.

Figure 5. Proportion and Estimated Average Annual Number of Adult Idaho Residents With Self-Reported Current Asthma, 2005-2007 Idaho BRFSS Aggregated										
Characteristics	Age									
	All Ages (18+)		18-24		25-34		35-64		65+	
	%	#	%	#	%	#	%	#	%	#
Sex										
Male	6.6%	35,000	4.3%	3,000	8.9%	9,000	6.2%	17,000	6.9%	5,000
Female	9.9%	53,000	10.6%	7,000	9.6%	9,000	10.1%	27,000	9.0%	8,000
Race										
White	8.3%	81,000	7.9%	10,000	9.2%	16,000	8.2%	42,000	8.1%	13,000
American Indian	13.1%	2,000	*	*	*	*	9.9%	1,000	*	*
African American	4.4%	<1,000	*	*	*	*	*	*	*	*
Asian/Hawaiian/ Pacific Islander	2.1%	1,000	*	*	*	*	4.1%	<1,000	*	*
Other	5.0%	2,000	*	*	4.7%	1,000	7.9%	1,000	*	*
Ethnicity										
Hispanic/Latino	4.0%	4,000	2.2%	1,000	4.0%	1,000	5.6%	2,000	2.8%	<1,000
Non-Hispanic/Latino	8.6%	84,000	8.3%	10,000	10.0%	18,000	8.3%	42,000	8.1%	13,000
Public Health District										
1-Panhandle	8.9%	14,000	12.6%	2,000	10.4%	3,000	8.7%	7,000	8.7%	2,000
2-North Central	7.4%	6,000	5.9%	1,000	7.0%	1,000	7.4%	3,000	7.4%	1,000
3-Southwest	8.3%	14,000	6.0%	1,000	9.2%	3,000	9.1%	7,000	9.1%	2,000
4-Central	7.6%	23,000	2.9%	1,000	10.6%	7,000	7.3%	11,000	7.3%	3,000
5-South Central	8.2%	10,000	11.3%	2,000	7.5%	2,000	7.8%	5,000	7.8%	2,000
6-South Eastern	7.7%	9,000	4.5%	1,000	8.9%	2,000	7.3%	4,000	7.3%	2,000
7-Eastern	9.6%	12,000	11.2%	3,000	7.3%	2,000	10.2%	6,000	10.2%	2,000
Socio-Economic Status (SES)¹										
Not Low SES	8.0%	45,000	N/A	N/A	9.3%	13,000	7.6%	32,000	N/A	N/A
Low SES	9.9%	18,000	N/A	N/A	9.0%	6,000	10.2%	12,000	N/A	N/A
Idaho Total	8.2%	88,000	7.3%	11,000	9.2%	19,000	8.2%	44,000	8.0%	13,000

*Figure not reliable by BRFSS standards (n<50)

¹Low SES definition: a) less than high school education, or b) annual household income less than \$25,001, or c) Medicaid or Medicare is health care coverage used to pay for most medical care or no health care coverage. Excluded from the low SES category are those with a household income greater than \$50,000 or those with a 4-year college education. Analysis includes adults ages 25-64.

Source: Idaho BRFSS, 2005-2007

Youth Prevalence

According to results of the Idaho BRFSS, 7% (representing approximately 9,000 youth) of Idaho youth have current asthma. Similar to the distribution of asthma among adult males and females in Idaho, females aged 17 and younger in Idaho are nearly twice as likely as males (aged 17 and younger) to report having current asthma (8% and 5% respectively). Idaho BRFSS results suggest that there are not any significant differences in the rates of current asthma among youth by geography or ethnicity, although non-Hispanic/Latino youth do have slightly lower current asthma prevalence rates than Hispanic/Latino youth (Figure 6).

While the Idaho YRBS only represents 9th through 12th grade public school students in Idaho, the self-reported lifetime asthma prevalence rates are markedly higher than lifetime youth asthma rates for all Idaho youth (specifically the 2007 rate obtained from the Idaho BRFSS). According to the YRBS, 19% of students have been told by a health professional they have asthma, compared to a lifetime asthma prevalence rate of 10% from the Idaho BRFSS (for all youth age 17 and younger). This discrepancy is likely due to the fact that older children have had more opportunities to be diagnosed and the self-reported nature of the YRBS compared to the parent-reported methodology of the BRFSS.

Compared to the U.S., Idaho's 2006 child asthma lifetime prevalence of 10% is lower than the U.S. child asthma lifetime prevalence rate of 14% (U.S. source: 2006 National Health Interview Survey).

According to 2003-2004 results of the National Survey of Children's Health, the impact and severity of asthma among children in Idaho is noticeably less than the U.S. as a whole. Among Idaho children, 5% are affected by asthma (compared to 8% nationally) and 12% of children's asthma has a great or medium impact on the family (compared to 16% nationally).

(For methodological information see Appendix.)

In order to obtain reliable estimates of current asthma among certain sub-populations and age-groups, two years of Idaho BRFSS data were aggregated for the table below.

Figure 6. Proportion and Estimate Average Annual Number of Youth in Idaho With Self-Reported Current Asthma, 2005-2006

Characteristics	Age							
	All Ages (0-17)		0-4		5-9		10-17	
	%	#	%	#	%	#	%	#
Sex								
Male	8.1%	6,000	7.6%	1,000	8.2%	1,000	8.5%	3,000
Female	4.9%	3,000	2.8%	<1,000	4.5%	1,000	6.0%	2,000
Ethnicity								
Hispanic/Latino	7.1%	1,000	8.6%	<1,000	8.8%	<1,000	4.8%	<1,000
Non-Hispanic/Latino	6.4%	8,000	4.7%	1,000	6.0%	2,000	7.6%	4,000
Public Health District								
1-Panhandle	7.3%	1,000	6.6%	<1,000	4.5%	<1,000	9.9%	1,000
2-North Central	8.0%	<1,000	3.8%	<1,000	4.7%	<1,000	12.0%	<1,000
3-Southwest	6.2%	2,000	8.3%	1,000	4.9%	<1,000	5.9%	1,000
4-Central	5.5%	2,000	4.9%	<1,000	5.3%	<1,000	5.8%	1,000
5-South Central	6.1%	1,000	6.5%	<1,000	7.2%	<1,000	5.4%	<1,000
6-South Eastern	6.8%	1,000	1.0%	<1,000	11.3%	1,000	7.6%	1,000
7-Eastern	7.4%	2,000	3.6%	<1,000	6.1%	<1,000	10.4%	1,000
Total	6.5%	9,000	5.2%	2,000	6.3%	2,000	7.3%	5,000

Source: Idaho BRFSS, 2005-2006

Asthma Symptoms

Physicians can determine the severity of an individual's asthma using the following characteristics; frequency of symptoms, frequency of symptoms causing nighttime awakenings, frequency of beta-agonist use for symptom control, the impact of symptoms on normal activity, and lung function tests. A classification system for asthma severity has been developed by the NHLBI. The table below (Figure 7) is for persons 12 years and older. Note that the classification for asthma severity is based on having any feature that fits that category. For instance, an individual with beta-agonist use less than twice a week but experiences nightly awakenings due to symptoms would be classified as "severe persistent."

Figure 7. Classification of Asthma Severity (Persons > 11 years of age)					
Severity Classification	Symptoms	Nighttime Awakenings	Short acting beta-agonist use for symptom control	Interference with normal activity	lung function
<i>Severe Persistent</i>	Throughout the day	Often (7 times per week)	Several times per day	Extremely limited	FEV <60% predicted, FEV/FVC reduced >5%
<i>Moderate Persistent</i>	Daily	>1 times per week but not nightly	Daily	Some limitation	FEV >60% but <80% predicted, FEV/FVC reduced 5%
<i>Mild Persistent</i>	>2 days per week but not daily	3 - 4 times per month	>2 days per week, but not daily	Minor Limitation	FEV >79% predicted, FEV/FVC normal
<i>Intermittent</i>	<2 days per week	<3 times per month	<3 days per week	None	Normal FEV between exacerbations, FEV >80% predicted, FEV/FVC normal

Notes:

FEV - forced expiratory volume; FVC - forced vital capacity.

Normal FEV/FVC: 9-19 years is 85%; 20-39 years is 80%; 40-59 years is 75%; 60 to 80 years is 70%.

Source: National Heart, Lung, and Blood Institute, Guidelines for the Diagnosis and Management of Asthma (EPR-3), 2007.

Over time (most asthma symptom measures used by the IAPCP have been collected through the Idaho BRFSS since calendar years 2001 or 2002), there have been few statistically significant changes in measures associated with asthma symptoms among adults in Idaho. These self-reported asthma measures typically include the presence of asthma symptoms, difficulty sleeping, difficulty carrying out usual activities, inhaler use, and experiencing asthma attacks (in the past year).

According to results of the 2007 Idaho BRFSS (Figure 8), asthma symptoms continue to burden Idaho adults to a large degree. Nearly 1 in 3 adults (30%) with current asthma had symptoms more than twice a week during the previous month, and over half (59%) of Idaho adults with current asthma experienced an asthma attack in the previous year. In addition to experiencing asthma symptoms, 1 in 8 Idaho adults (13%) with current asthma had difficulty sleeping on five or more days during the previous month due to nighttime asthma symptoms. Approximately 1 in 4 Idaho adults (23%) with current asthma reported the need to use an inhaler to control their asthma on five or more days during the previous month, possibly indicating a need to better manage their asthma and their exposure to asthma triggers. Aside from the asthma symptoms, the impact of asthma on the daily lives of Idaho adults with current asthma can be measured by looking at the percent who are unable to carry out their usual activities because of their asthma. Among Idaho adults with current asthma, 13% reported that they were unable to carry out their usual activities on 11 or more days in the past year because of their asthma.

(For methodological information see Appendix.)

Figure 8. Asthma Symptoms Among Idaho Adults Who Have Been Diagnosed with Current Asthma, 2007			
<i>Asthma Symptom Measure</i>	%	Lower C.I.	Upper C.I.
Percent of Idaho Adults With Current Asthma Who Had Asthma Symptoms More Than Twice a Week In The Last Month	30.1	24.5	36.4
Percent of Idaho Adults With Current Asthma Whose Nighttime Symptoms Made it Difficult to Sleep Five or More Days in the Last Month	12.5	9.0	17.0
Percent of Idaho Adults Unable to Carry Out Their Usual Activities 11 or More Days in the Last Year Because of Their Asthma	5.1	3.4	7.6
Percent of Idaho Adults With Current Asthma Who Used an Inhaler to Control Their Asthma five or More Times in the Last Month	23.4	17.9	29.9
Percent of Idaho Adults With Current Asthma Who Had An Asthma Attack in the Last Year	59.3	52.9	65.4

Source: Idaho BRFSS, 2007

Quality of Life

People whose asthma is properly managed may potentially lead healthy and active lives. However, asthma that is not properly managed and cannot be controlled can negatively impact a person's quality of life. Also, uncontrolled asthma may result in additional visits to a health care professional or the emergency room, which is financially burdensome, disruptive, and may cause increased stress for those individuals with asthma (i.e. decrease their quality of life).

General Health Status

From 1999 to 2006, Idaho adults who reported current asthma were significantly more likely than adults without current asthma to report their general health as fair or poor (29% and 14% respectively in 2007). In addition to experiencing adverse asthma symptoms, persons with asthma frequently suffer from other chronic conditions such that their general health status may be impacted negatively. (Figure 9)

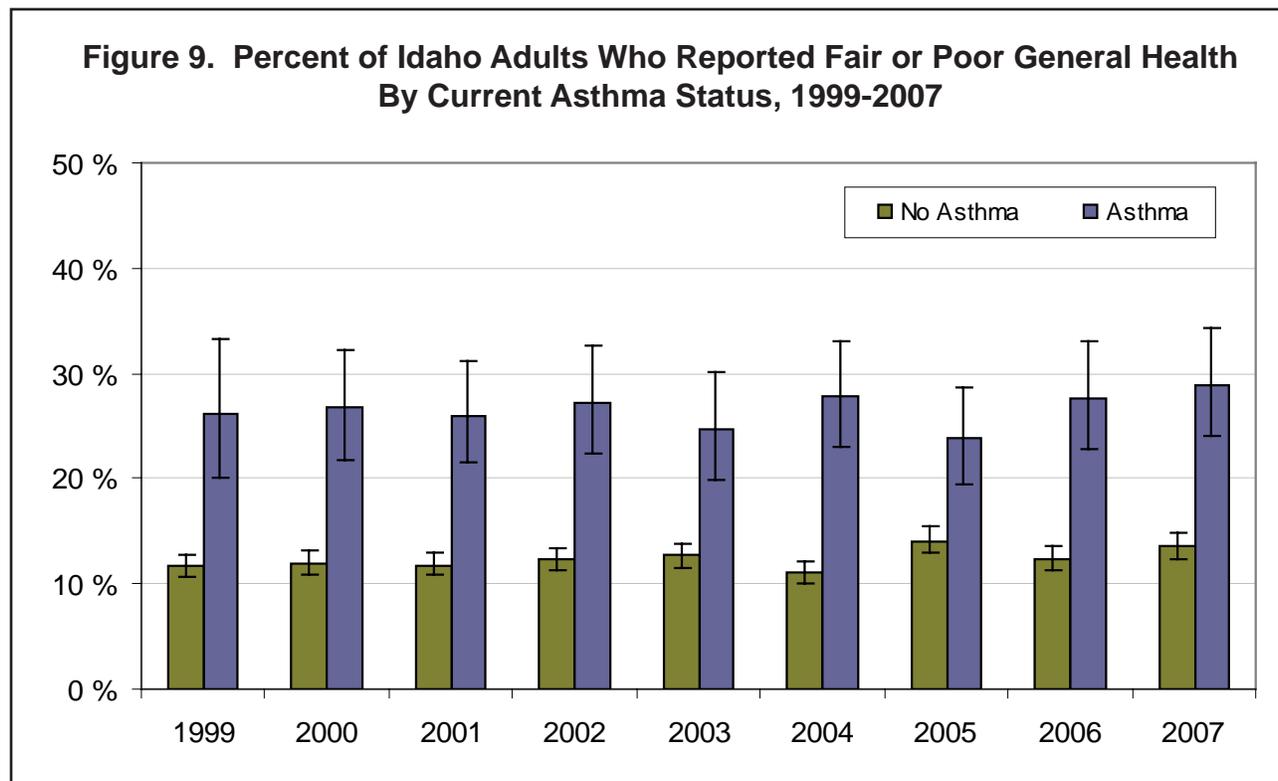
Visited Health Professional for Worsening Asthma

Each year, roughly 20% of Idaho adults with current asthma report visiting a health professional because of their worsening asthma.

Visited Emergency Room Due to Asthma

Since 2001, over 10% of Idaho adults with current asthma visited an emergency room because of their asthma.

(For methodological information see Appendix.)



Source: Idaho BRFSS, 1999-2007

Asthma Management

Asthma is highly variable over time, and periodic monitoring is essential to successful management. NHLBI guidelines recommend that doctor visits are scheduled at two to six week intervals while gaining control of asthma, and at one to six month intervals thereafter to monitor that sufficient control is maintained. Reducing risk behaviors and environmental exposures are also critical components to asthma management.

The goal of asthma management is to prevent or reduce asthma symptoms and exacerbations, as well as maintain normal levels of physical activity (in addition to maintaining the ability to perform a persons usual daily activities). In order to acheive this goal, the EPR-3” has identified four components of asthma management: assessment and monitoring of asthma symptoms, medication use, asthma self-management education, and controlling co-morbid conditions and environmental factors that can exacerbate a person’s asthma.

Currently, the IAPCP tracks several self-reported measures through the Idaho BRFSS that relate to asthma management, including obtaining routine asthma checkups, past month medication use, influenza and pneuemonoccal vaccinations, the presence of mold in the home, and the prevalence of certain risk factors associated with asthma or asthma symptoms (i.e. smoking, physical inactivity, and obesity).

Public School Asthma Action Plans and Asthma Awareness Training

Results of the 2006 Idaho School Health Education Profile Survey (SHEPS) indicate that 43% of Idaho public schools have a school-based asthma action plan for all students with asthma (down from 59% in 2004). As part of the SHEP survey, school health education staff were asked about development training they received during the previous two years and what type of development training they’d like to receive in the future. During the previous two years, 16% of school health educators received training on asthma awareness, and 54% of school health educators said they would like to receive training on asthma awareness.

Self-Management

Idaho data show that there have been no significant changes over time for most of the surveillance measures associated with asthma self-management; specifically, routine asthma checkups, medication use, annual influenza and lifetime pneumococcal vaccination.

Figure 10. Asthma Self-Management Among Idaho Adults Who Have Been Diagnosed with Current Asthma, 2007

<i>Asthma Self-Management Measure</i>	%	Lower C.I.	Upper C.I.
Percent of Idaho Adults With Current Asthma Who Had a Routine Asthma Checkup Two or More Times in the Past Year	19.1	14.9	24.1
Percent of Idaho Adults With Current Asthma Who Took Asthma Medication to Prevent an Asthma Attack in the Past Month	57.4	50.7	63.9
Percent of Idaho Adults With Current Asthma Who Had an Influenza Vaccination in the Past Year	46.4	40.1	52.9
Percent of Idaho Adults With Current Asthma Who Had Had a Pneumococcal Vaccination in Their Lifetime	38.5	32.3	45.1

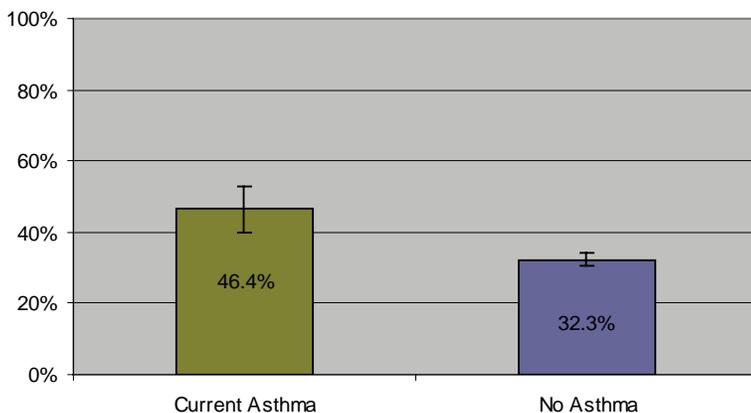
Source: 2007 Idaho BRFSS.

Idaho currently does not have a way to measure the proportion of persons with asthma who have received asthma self-management education. The IAPCP will request that an asthma self-management education state-added module be included in the 2010 Idaho BRFSS, but the program has been warned that inclusion of state-added asthma questions in the Idaho BRFSS currently can not be guaranteed due to the number of requests by other Idaho Division of Health programs.

The percentage of Idaho adults with current asthma who had a routine asthma check up has not changed significantly since 2002 (16%), although the number increased slightly to 19% in 2007 (Figure 10). Ideally, the percent of adults with current asthma who had two or more routine asthma checkups in the past year will increase as IAPCP efforts encourage them to have routine checkups.

Although past month asthma medication use is not necessarily a good measure of self-management as quick-relief medications can be overused, it may indicate a person with asthma's willingness to self-manage. Idaho BRFSS data addressing medication use among adults (Figure 10) with current asthma has been collected since 2005 with no significant change through 2007 (57%). In order to sufficiently measure asthma medication usage, the IAPCP would need to assess the specific medications being used, the frequency and dosage being used, and whether their use corresponds with an asthma action plan which was completed by their doctor or other appropriate health care professional.

Figure 11. Percent of Adults Who Have Received Annual Influenza Vaccination by Current Asthma Status, 2007

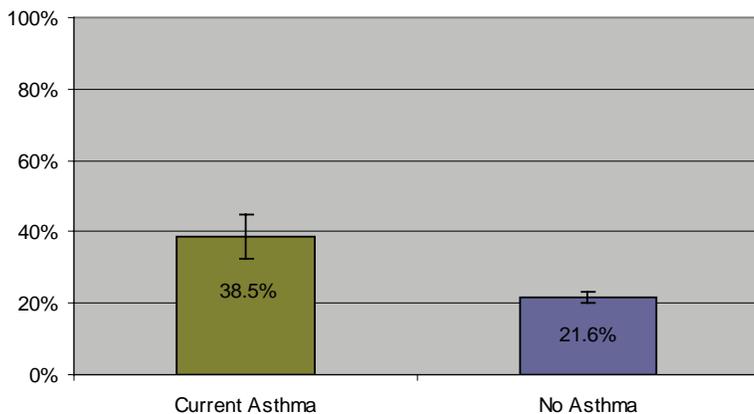


Source: Idaho BRFSS, 2007

The Centers for Disease Control and Prevention (CDC) recommend that all persons with asthma receive an annual influenza vaccination because of their elevated risk of medical complications from influenza. Results of the 2007 Idaho BRFSS indicate 46% of Idaho adults with current asthma were immunized against influenza in the past year (Figure 11). It is important to note that adults with current asthma in Idaho were statistically more likely to receive an annual influenza vaccination than adults without asthma (32%).

According to the Advisory Committee on Immunization Practices (ACIP), asthma is an independent risk factor for invasive pneumococcal disease, and therefore the ACIP recommends that adults with asthma aged 19 through 64 years be vaccinated against pneumococcal disease. In 2007, the percentage of Idaho adults with current asthma who had ever received the vaccine was 39% versus 22% of adults without asthma, a statistically significant difference (Figure 12).

Figure 12. Percent of Adults Who Have Received Lifetime Pneumococcal Vaccination by Current Asthma Status, 2007



Source: Idaho BRFSS, 2007

Although Idaho's immunization rates for influenza and pneumococcal disease among adults with asthma are significantly higher than those immunization rates among adults without asthma, however there are a large proportion of asthmatic adults (roughly two-thirds of all adults with asthma) who could benefit from increased immunization rates.

Risk Factors

In Idaho, adults with current asthma (18%) are only slightly less likely than adults who have not been diagnosed with current asthma (19%) to report that they smoke (Figure 13). These results suggest that people with asthma continue to smoke despite their asthma diagnoses; even though smoking is known as a common trigger of asthma symptoms.

When it comes to leisure time physical activity, most Idaho adults with asthma indicate they are participating in some form of leisure time activity, with 25% of adults with asthma indicating they do not participate in any leisure time physical activity (versus 19% of adults without asthma - Figure 13). Although the difference in participation of leisure time physical activity between adults with asthma and those without is not statistically significant, with proper asthma management, nearly all adults with (or without) asthma should be able to safely participate in some form of leisure time physical activity.

Although it has not been clearly established that obesity is a risk factor for asthma, there is evidence that suggests obesity and asthma are linked. Furthermore, while the precise mechanism is not yet known, obesity appears to affect airway hyper-responsiveness and asthma severity. In Idaho, 10% of obese adults have current asthma (compared to 8% of non-obese adults). While the difference in asthma prevalence between obese and non-obese adults is not significant, it is clear from the research that reducing the proportion of obese Idahoans should assist in reducing the overall burden of asthma in Idaho.

(For methodological information see Appendix.)

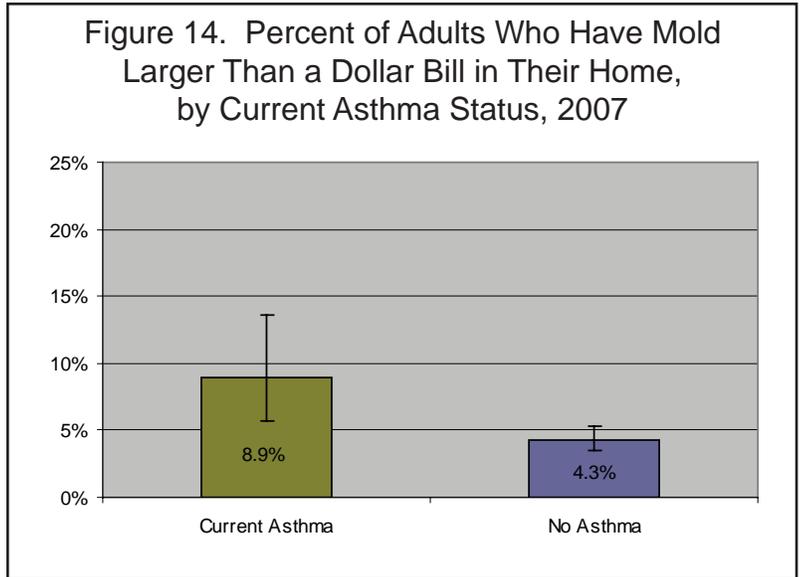
Figure 13. Asthma Risk Factors Among Idaho Adults Who Have Been Diagnosed with Current Asthma and Those Adults Not Ever Diagnosed with Asthma, 2007		
	Adults with Asthma	Adults without Asthma
<i>Asthma Risk Factor Measure</i>	% (95% C.I.)	% (95% C.I.)
Percent of Idaho Adults With Current Asthma Who Smoke Cigarettes	18.1 (14.9 - 24.1)	19.2 (17.6 - 20.9)
Percent of Idaho Adults With Current Asthma Who Did Not Participate in Leisure Time Physical Activity Durng the Past Month	25.3 (20.2 - 31.2)	18.9 (17.5 - 20.4)
Percent of Idaho Adults Who Are Obese (based on their self reported height and weight)	29.5 (24.5 - 35.1)	24.7 (23.0 - 26.4)

Source: Idaho BRFSS, 2007

Environmental Exposures

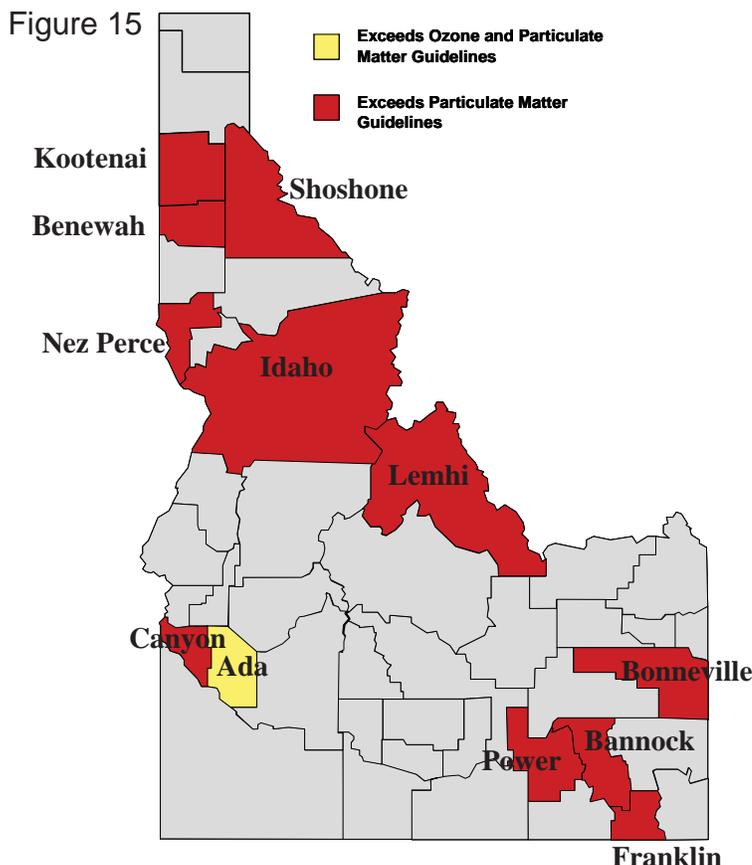
Environmental exposures to allergens, air pollutants, environmental tobacco smoke (ETS), and workplace exposures can cause and exacerbate asthma, therefore, controlling one's environmental exposures can significantly improve the quality of life of people with asthma.

According to the CDC, when mold is inhaled, it can cause an asthma attack. (CDC www.cdc.gov/asthma/faqs.htm) For people who are sensitive to molds, nasal stuffiness, throat irritation, coughing or wheezing, eye irritation, or skin irritation can result from exposure. In addition, people with mold allergies may have more severe reactions. Results of the 2007 Idaho BRFSS, show that adults who report mold (in an amount larger than a dollar bill) in their home are significantly more likely to have current asthma than those who do not report the presence of mold in their home (9% and 4% respectively - Figure 14).



Source: Idaho BRFSS, 2007

In addition to mold and other allergens (such as pet dander), air pollution in the form of particulate matter (typically haze, smoke, and/or dust) and ozone can affect asthma, making it harder for someone with asthma to breathe. Ozone and particulate exposure have been shown to result in increased asthma symptoms, resulting in more medical treatment. Four of Idaho's five most populated counties have regularly exceeded Environmental Protection Agency (EPA) guidelines for healthy levels of these pollutants since 1999. (Figure 15)



Idaho Counties That Exceeded Environmental Protection Agency Guidelines for Healthy Air, 1999-2008
Years That Exceeded Guidelines

Ada - 2000, 2001, 2002, 2004, 2006, 2007, 2008
 Bannock - 1999, 2000, 2001, 2002
 Benewah - 2003, 2004
 Bonneville - 2004
 Canyon - 2000, 2001, 2002, 2004, 2005
 Franklin - 2005, 2008
 Idaho - 2007
 Kootenai - 1999, 2002
 Lemhi - 2000, 2004, 2007
 Nez Perce - 1999
 Power - 1999, 2000, 2001, 2002, 2004, 2005, 2008
 Shoshone - 2001, 2002, 2003, 2004, 2005, 2008

Asthma Mortality

Between 2002 and 2006, the average annual number of deaths due to asthma in Idaho (note about ICD-10 codes) was 19, with a peak number of 24 asthma deaths occurring in 2005 (Figure 16). In 2006, 15 Idaho residents died due to asthma resulting in an age-adjusted asthma death rate of 1.3 per 100,000 population. U.S. data for 2006 are not currently available for comparison, however in 2005, Idaho's age-adjusted death rate (1.8 per 100,000) was slightly higher than the U.S. age-adjusted death rate of 1.3 per 100,000 population (a rate similar to Idaho's 2006 age-adjusted death rate).

Residence	2006			2005			2004			2003			2002		
	Death Rate ^{2,3}		Number												
	Crude	Age-Adjusted ⁴		Crude	Age-Adjusted ⁴		Crude	Age-Adjusted ⁴		Crude	Age-Adjusted ⁴		Crude	Age-Adjusted ⁴	
Idaho	15	1	1.3	24	1.7	1.8	22	1.6	1.6	19	1.4	1.5	15	1.1	1.2
United States	N/A	N/A	N/A	3,857	1.3	1.3	3,816	1.3	1.3	4,099	1.4	1.4	4,261	1.5	1.5

Source: Idaho Vital Records

Review of aggregated asthma mortality data (2002-2006) shows that there was no significant difference in age-adjusted death rates between males and females in Idaho. Only small geographical differences are seen in the crude death rate (i.e. by Idaho Public Health District). Due to the relatively small number of asthma deaths in Idaho, the results should be interpreted with caution (Figure 17).

The majority (63%) of asthma deaths in Idaho are among those age 65+ years, with an additional 32% of all asthma deaths occurring among those Idahoans aged 35 to 64 years (Figure 18).

Despite the relatively low proportion of deaths in Idaho attributed to asthma (roughly 0.1% of all deaths each year in Idaho are due to asthma), the IAPCP has made plans to investigate asthma mortality in Idaho more closely and will provide further information (in future burden reports, etc.) when it becomes available.

RESIDENCE	Number of Deaths	Crude Death Rate ^{2,3}
IDAHO	95	1.4
District 1	16	1.6
District 2	9	1.8
District 3	16	1.5
District 4	20	1.1
District 5	18	2.1
District 6	5	0.6
District 7	11	1.3

Source: Idaho Vital Records

AGE	Number of Deaths	Crude Death Rate ^{2,3}
TOTAL	95	1.4
< 5	1	0.2
5-14	1	0.1
15-34	3	0.1
35-64	30	1.2
65+	60	7.6

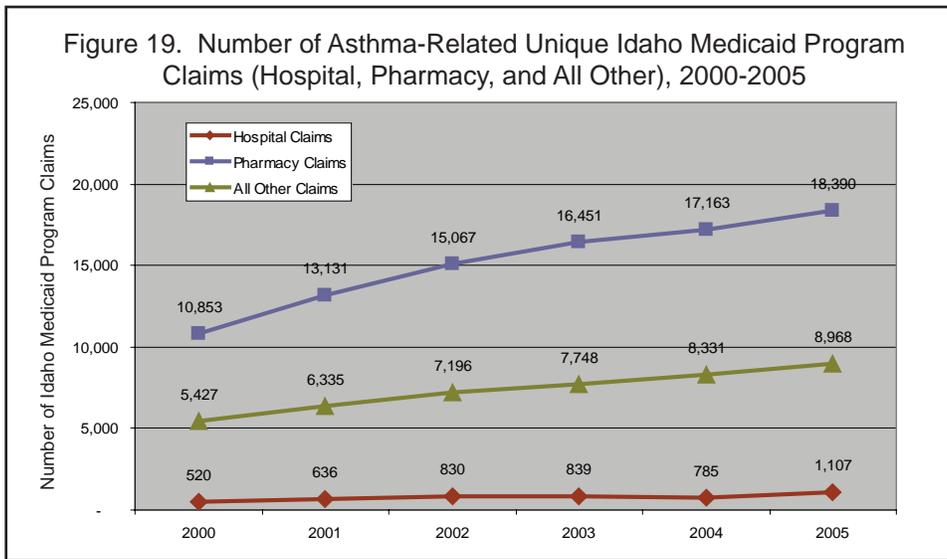
Source: Idaho Vital Records

(For methodological information see Appendix.)

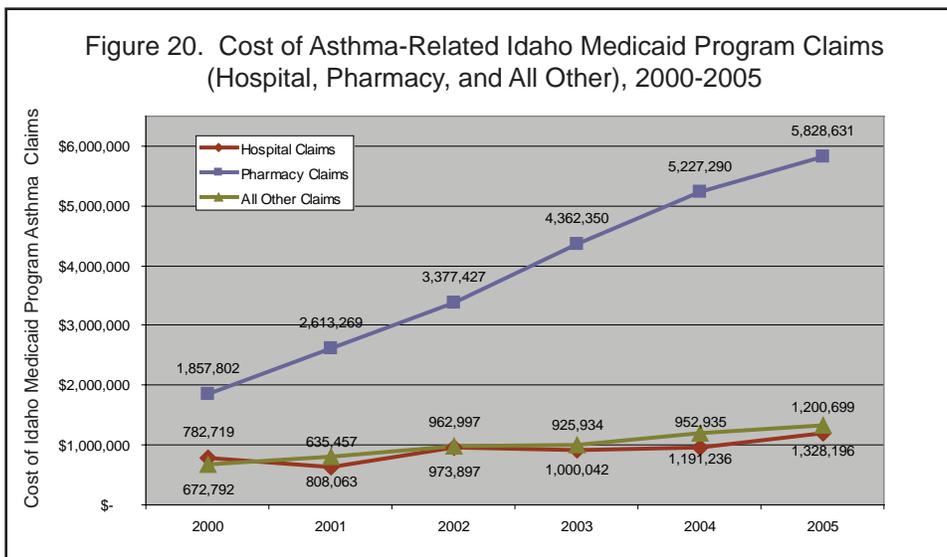
Idaho Medicaid Program Asthma-Related Claims

Because Idaho lacks comprehensive hospital discharge data, it is difficult to accurately assess the total medical costs associated with asthma in Idaho. However, asthma-related Medicaid costs and client claims have been increasing steadily in Idaho since 2000. In 2000, the Idaho Medicaid program received 16,800 unique client claims (a combination of hospital, pharmacy, and other claims). In 2005 (the latest year with complete data), the Idaho Medicaid program received 28,465 unique client claims, representing a 69% increase in unique client claims (Figure 19). This number is particularly troublesome as the number of Idaho residents diagnosed with current asthma did not increase in a similar manner. In addition to the increase in unique client claims, the cost of asthma-related claims increased from \$3,313,313 in 2000 to \$6,169,926 in 2005 (an 86% increase). In particular, pharmacy claims were the biggest source of asthma-related spending, increasing 214% between 2000 and 2005 (Figure 20).

Based on these data, it would seem logical that increasing asthma self-management (through education, etc.) could help reduce Medicaid costs associated with asthma-related hospital claims.



Source: Idaho Medicaid Program



Source: Idaho Medicaid Program

Idaho Child Health Insurance Program (CHIP)

An Idaho CHIP beneficiary is defined as having asthma if they had either one medical service (office/clinic, ER, or hospital) claim with a primary or secondary diagnosis code for asthma or at least two prescription claims for asthma-related drugs (one of which had to be something other than an oral steroid). During calendar year 2007 there were 5,392 CHIP beneficiaries in Idaho that received paid claims meeting the definition of asthma. Using this definition, the overall asthma prevalence for CHIP beneficiaries was 14%. This is roughly 53% higher than BRFSS estimates of childhood asthma (17 and younger) in the general population. The prevalence was higher among male (16.5%) than it was for female (11.6%) CHIP beneficiaries.

Economic costs of asthma

In 2007, the CHIP program paid just over 2 million dollars to beneficiaries in asthma prescription claims alone. An additional 1.3 million dollars were paid to claims for asthma-related hospitalizations, emergency department, and office/clinic visits. The average paid claim for asthma-related office/clinic visits was \$151.72, for ER visits \$181.14, and for hospitalizations \$3,003.93.

Data Limitations

When based on administrative data, estimates of disease prevalence within a population may have little concordance from one year to the next. For example, a CHIP child may have asthma but not need services in the past year (or, may fail to update eligibility documents). Therefore, this document perhaps is an estimate of prevalence among those seeking care rather than asthma prevalence among all CHIP enrollees. 'Actual' asthma prevalence within this population may be higher than what is reported here. Estimates may also be influenced by (and thus be either higher or lower) a variety of factors including: the definition of asthma, CHIP eligibility requirements, and clinical practices of physicians/hospitals.

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Appendix B - Data Sources

Idaho Vital Records - Idaho's Bureau of Vital Records and Health Statistics provides population statistics (demographic profiles, etc.) and mortality data.

For additional information regarding Idaho Vital Records contact the Bureau of Vital Records and Health Statistics at 208.334.6571 or an electronic copy of the latest *Idaho Vital Statistics* report can be found at http://www.healthandwelfare.idaho.gov/portal/alias_Rainbow/lang_en-US/tabID_3457/DesktopDefault.aspx

Idaho Behavioral Risk Factor Surveillance System (BRFSS) - The Behavioral Risk Factor Surveillance System is an ongoing surveillance program developed and partially funded by the Centers for Disease Control and Prevention (CDC). It is designed to estimate the prevalence of risk factors for the major causes of morbidity and mortality in the United States. The survey provides Idaho-specific estimates of the proportion of adults aged 18 and over reporting health risk behaviors.

The BRFSS is conducted as a random telephone survey of the non-institutionalized adult population. The sample size has grown from 600 people in 1984 to over 5,300 in 2007. The survey is administered every month of the calendar year. After annual data collection is complete, individual responses are weighted to be representative of the state's adult population, and analysis is performed on the weighted data.

Several BRFSS core, optional, and state-added modules were utilized for this report including: BRFSS Core Adult Prevalence module, BRFSS Child Prevalence module, BRFSS Random Child Selection module, and BRFSS Adult Asthma History module.

Additional information regarding BRFSS methodology is available online at <http://www.cdc.gov/brfss>.

Idaho Youth Risk Behavior Survey (YRBS) - The YRBS is one component of the Youth Risk Behavior Surveillance System (YRBSS) developed by the CDC in collaboration with representatives from 71 state and local departments of education and health, 19 other federal agencies, and national education and health organizations. The YRBSS was designed to focus the nation on behaviors among youth related to the leading causes of mortality and morbidity among both youth and adults and to assess how these risk behaviors change over time. The Idaho YRBS is administered every other year (in odd years) by the Idaho Department of Education. After data collection is complete, the responses are weighted to be representative of the state's public high school (grades 9-12) student population and analyses are performed on the weighted data.

Additional information regarding YRBS methodology is available online at <http://www.cdc.gov/healthyyouth/yrbs/index.htm>.

National Survey of Children's Health (NCHS) - The purpose of the National Survey of Children's Health is to address multiple aspects of children's health and well-being—including physical and mental health, health care, and social well-being—as well as aspects of the family and the neighborhood that can affect children's health. Specific asthma measures include asthma prevalence (lifetime and current); asthma disturbance; asthma burden on child's family; use of asthma medication; asthma episode during past year; and asthma-related hospital stays.

Additional information regarding NCHS methodology is available online at <http://www.cdc.gov/nchs/about/major/slats/nsch.htm>.

Idaho School Health Educator Profile Survey (SHEPS) - SHEPS utilizes two questionnaires (given to principals and lead health educators in Idaho schools with any of grades 6 through 12) developed by the Division of Adolescent and School Health (DASH), the National Center for Chronic Disease Prevention, and the CDC in collaboration with representatives of 75 state, local, and territorial departments of education. These questionnaires are used to monitor the current status of school health education.

Additional information regarding SHEPS methodology is available online at <http://www.cdc.gov/HealthyYouth/profiles/index.htm>.

Idaho Medicaid Program - Idaho Medicaid Claims data address the costs and claims related to asthma hospitalization, pharmacy costs, and other associated claims. These data cover all Idaho Medicaid Program eligible residents. Idaho Medicaid Program data are collected annually.

Additional information regarding the Idaho Medicaid Program is available online at http://www.healthandwelfare.idaho.gov/portal/alias_rainbow/lang_en-us/tabid_3348/desktopdefault.aspx

Idaho Children's Health Insurance Program (CHIP) - Asthma prevalence data of Idaho CHIP beneficiaries comes from Idaho Medicaid Program administrative data. These data include paid claims for Idaho residents qualifying for CHIP at any time during the year. Asthma prevalence associated with CHIP participants may have limitations due to the nature of claims data.

Additional information regarding the Idaho CHIP is available online at <http://www.idahochild.org/>.

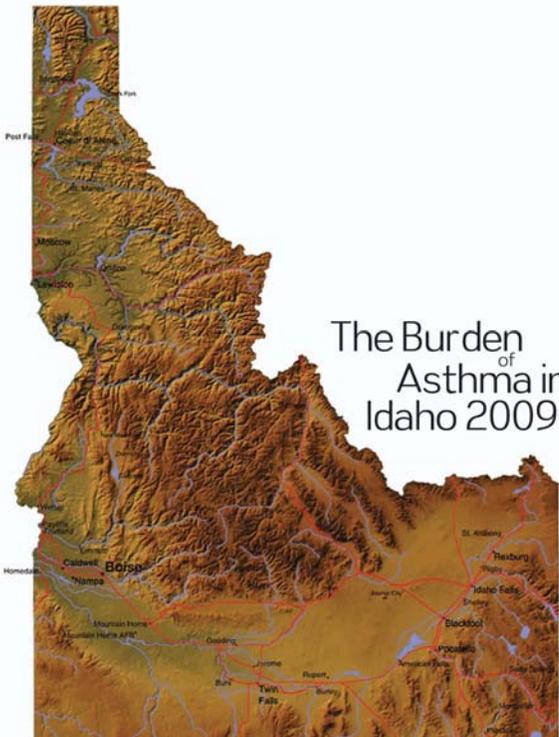
Appendix C: Technical Notes

Mortality Rates Age-Adjusted to the Year 2000 U.S. Standard - Age adjustment is a statistical technique used to standardize rates. The technique is employed when comparing two or more populations with different age distributions. Age-adjusted rates are artificial measures for comparison purposes only and should not be used to measure the absolute magnitude of a health issue. To allow for comparison, the same standard population must be used. Statistically, it is a weighted average of the age-specific death rates, where the weights represent the fixed population proportions by age. There are two methods for age-adjusting rates: direct and indirect. In this report, Idaho age-adjusted rates were developed using the direct method.

Data analysis

Weighting - survey data were weighted to the respondent's probability of selection as well as age, sex, or grade based population estimates.

Analysis - analyses were conducted using the SAS statistical package with SAS-Callable SUDAAN software for statistical testing and calculation of confidence intervals (calculated as 1.96 times the standard error of the statistic) using sample weights.



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