Oregon Asthma Surveillance Report

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Table of Contents

Table of Tables

Table of Figures

Executive Summary

This report provides information on the impact of asthma in Oregon and, when possible, compares Oregon to the United States and to *Healthy People 2010* objectives. The primary topics include asthma prevalence, asthma emergency department (ED) or urgent care visits, asthma hospitalizations, asthma mortality, asthma control, asthma management, risk factors associated with asthma, and asthma in the Medicaid population. The main findings for these topics are summarized in each section and are highlighted in the paragraphs below. Additional data from one of our primary sources, the Behavioral Risk Factor Surveillance System (BRFSS), are available on the Oregon Asthma Program website at http://www.oregon.gov/DHS/ph/asthma/datareport/index.shtml. Listings, descriptions, and limitations of the primary data sources for this report are available in Appendix A.

Asthma Prevalence

Asthma prevalence in Oregon continues to rise and is considerably higher than the U.S. average. Current asthma prevalence in 2005 was 9.9% in Oregon adults aged 18 or older and 8.4% in Oregon children less than 18 years of age. These prevalence estimates mean that approximately 347,000 Oregonians currently have asthma, with almost 274,000 Oregon adults aged 18 or older and nearly 73,000 Oregon children aged <18 with current asthma.

Asthma prevalence in Oregon differs by demographic factors. For example, in 2005 the prevalence of current asthma was higher in women (12.4%) than men (7.4%). Asthma prevalence for 2004-2005 also varied by race/ethnicity with the highest prevalence among non-Hispanic Blacks (16.5%) and non-Hispanic American Indians or Alaska Natives (15.3%), followed by non-Hispanic Whites (10.1%), non-Hispanic Asians or Pacific Islanders (6.4%), and Hispanics (4.9%).

Asthma prevalence in Oregon also differs by socioeconomic factors. In 2005, current asthma prevalence was higher among those with a household income of less than $25,000 per year than among people with higher household incomes. In addition, in 2005 the prevalence of current asthma among the Medicaid population (20.7%) was more than double that of people who had private or Medicare insurance (9.2%) or who had no health insurance (9.4%).

Pediatric Asthma

Asthma is the most common chronic disease in children. Current asthma prevalence in all children <18 years of age was 8.4% in 2005. Asthma prevalence in 2006 for 8th and 11th grade students was very similar to the most recent values obtained for adults and was found to be 10.0% and 9.7%, respectively.

A survey conducted in 2006 of Oregon schoolchildren in 8th and 11th grades has provided data beyond prevalence. For example, approximately 9% of students in each grade reported that they have had an asthma episode or asthma attack in the past 12 months. The survey results also showed that having asthma resulted in missed school days and difficulty sleeping at night; specifically, about 14% of 8th graders and 9% of 11th graders reported missing at least one day of school because of asthma in the past 30 days, and approximately 40-50% of 8th and 11th grade students with asthma reported difficulty sleeping due to asthma for at least one night in the past 30 days.

Emergency Department or Urgent Care Visits for Asthma

According to findings from the Behavioral Risk Factor Surveillance System (BRFSS), the percentage of Oregonians with asthma who have visited an ED or urgent care center in the past 12 months decreased from 2001 (17.2%) to 2003 (12.9%). Similar to current asthma prevalence, there was a noticeable gender difference among people with asthma surveyed in 2003 such that females (14.1%) were more likely than males (10.7%) to have an ED or urgent care visit for asthma in the past 12 months.

Medical claims data from Oregon's Asthma Data Workgroup (ADWG) and Oregon's Division of Medical Assistance Programs-Quality and Performance Improvement Workgroup (DMAP-QPIWG) indicate that, from 2001-2005, Oregonians with asthma who had Medicaid health insurance were twice as likely to have an ED visit for asthma in the past 12 months as people with commercial health insurance. Unfortunately, regardless of the type of insurance, only about 40% of Oregonians who had an ED visit for asthma also had a follow-up outpatient visit within 30 days of the ED visit.

Asthma Hospitalizations

In 2005, there were 2,446 hospitalizations in Oregon in which asthma was the principal discharge diagnosis. Although this number seems high, the asthma hospitalization rate has primarily decreased from 1997 through 2005, and the lowest rate of 6.1 hospitalizations per 10,000 Oregon residents occurred in 2004. This 2004 rate represents a 9% decrease compared to 2000 and an 18% decrease compared to 1997. Furthermore, despite Oregon's higher asthma prevalence compared to many states and the national prevalence estimate, Oregon asthma hospitalization rates are lower than the U.S. rates and in 2005 were lower than the Healthy People 2010 targets except in people aged 65 years or older.

Asthma Mortality

Deaths due to asthma are relatively infrequent events. In 2004, there were 49 deaths attributed to asthma in Oregon for a rate of 13.3 deaths per million Oregonians. Oregon's asthma mortality rate has decreased 41% from 1999 to 2004. Although the mortality rate for females is historically higher than that for males, the difference between the sexes is decreasing over the years, and mortality rates were virtually the same for both sexes in 2004. Oregon's 2002-2004 asthma mortality rates were below Healthy People 2010 targets for ages 5-14 and 15-34 years, but Oregon's rates were above the targets for ages 0-4, 35-64, and 65 years or older.

Asthma Control

In 2005, 60% of adult Oregonians with asthma reported having asthma symptoms at least once a week in the past four weeks. About 22% of people surveyed in 2003 also reported three or more sleep disturbances in the past month due to asthma. In 2005, people without asthma were 38% more likely than people with asthma to report very good or excellent health. In 2005, 76% of people with asthma did not report missing any work or usual activities in the past 12 months due to asthma. However, 16% of people with asthma missed 1-10 days and 9% missed more than 10 days in the past 12 months due to asthma.

Asthma Management

The BRFSS Asthma Callback Survey was first administered to adult Oregonians with asthma in 2005. Preliminary results from the callback survey show that only 19% of those surveyed have ever received an asthma action plan from their healthcare provider, and about 7% have taken a course or class on how to manage their asthma. In addition, roughly 38% of adult Oregonians with asthma are taking an inhaled corticosteroid, which helps prevent asthma symptoms and asthma attacks, either alone or in combination

with a beta$_2$-agonist. However, 57% are only taking a beta$_2$-agonist inhaler, which is a rescue medication and does not help prevent future attacks.

In addition to the BRFSS Asthma Callback Survey, medical and pharmacy claims data from the ADWG indicate that, of Oregonians with persistent asthma in 2005, 79% of those covered by private insurance and 65% of those covered by Medicaid received at least one inhaled corticosteroid medication in the past year. However, 26% of those covered by private insurance and 42% of those covered by Medicaid received more than six dispensings of a short-acting beta$_2$-agonist rescue medication in the past year, which indicates that a quarter to nearly a half of Oregonians with persistent asthma are not effectively managing their asthma.

Risk Factors for Asthma

Smoking is associated with asthma. For example, current asthma prevalence in 2005 is highest among current smokers who smoke every day (12.5%) followed by current smokers who smoke some days (11.4%), former smokers (10.0%), and people who have never smoked (9.0%). People with current asthma in 2005 were also 27% more likely to be current smokers than people without asthma (22.9% vs. 18.1%, respectively). Asthma prevalence was not related to secondhand smoke exposure; however, 33% of people with asthma reported at least some exposure to secondhand smoke in the past week.

Obesity is also linked to higher rates of asthma. For example, current asthma prevalence in 2005 was similar for people classified as normal or underweight (9.2%) or overweight (8.1%) based on body mass index (BMI)[1], whereas prevalence was higher for people classified as obese (12.9%) or extremely obese (13.7%). Furthermore, the percentage of people termed obese (BMI of 30 or more) in 2005 was higher for those with current asthma than for those without current asthma (37% vs. 27%, respectively).

Asthma in the Medicaid Population

Current asthma prevalence estimates among the Medicaid population range from 18.8% in 2004 to 20.7% in 2005 and are much higher than similar estimates in the non-Medicaid population (9.2%). Based on a 2004 of Medicaid recipients, 22% of people with asthma reported visiting an ED or an urgent care center for asthma in the past 12 months. Medical claims from 2001-2005 similarly indicate that 13-16% of Medicaid recipients with asthma had been to the ED for asthma in the past 12 months.

Among adult Medicaid recipients with asthma in 2004, 20% reported missing one or more days of work, school, or other activities because of asthma; 78% had asthma symptoms at least once a week in the past four weeks; and 67% reported at least some degree of limitation of their usual activities due to asthma. Medical claims collected by the DMAP-QPIWG and ADWG from 2001-2005 indicate that 59-66% of the Medicaid population received at least one daily inhaled corticosteroid (controller medication) in the past 12 months. However, similar to findings for people with commercial health insurance, 40-42% of Medicaid recipients also received more than six short-acting beta$_2$-agonists (rescue medication) in the past 12 months, indicating that their asthma is not well controlled.

As seen among the general Oregon adult population, current asthma prevalence among the Medicaid population in 2004 was higher for former smokers (22%) and current smokers (20%) than for people who have never smoked (16%). People with asthma were more likely to be current smokers (38%) than people without asthma (35%); also, Medicaid recipients with asthma were more likely to have secondhand smoke exposure (36%) than those without asthma (31%).

[1] Body mass index (BMI) is calculated by dividing a person's weight in kilograms by the square of the person's height in meters (BMI = kg/m^2).

Asthma Prevalence

Asthma prevalence is monitored primarily through the Behavioral Risk Factor Surveillance System (BRFSS). The BRFSS is a random-digit-dialed telephone survey that is administered annually to adults 18 years of age or older in each state. In addition to collecting basic demographic information such as age, sex, race/ethnicity, income, and education, the BRFSS includes questions on preventive health practices, health behaviors, and health risks associated with premature morbidity and mortality. Oregon has conducted the BRFSS since 1989 and asthma prevalence has been assessed since 1995; however, the asthma prevalence questions have changed somewhat over the years. The current surveillance definition has been used since 2001 and includes the following questions:

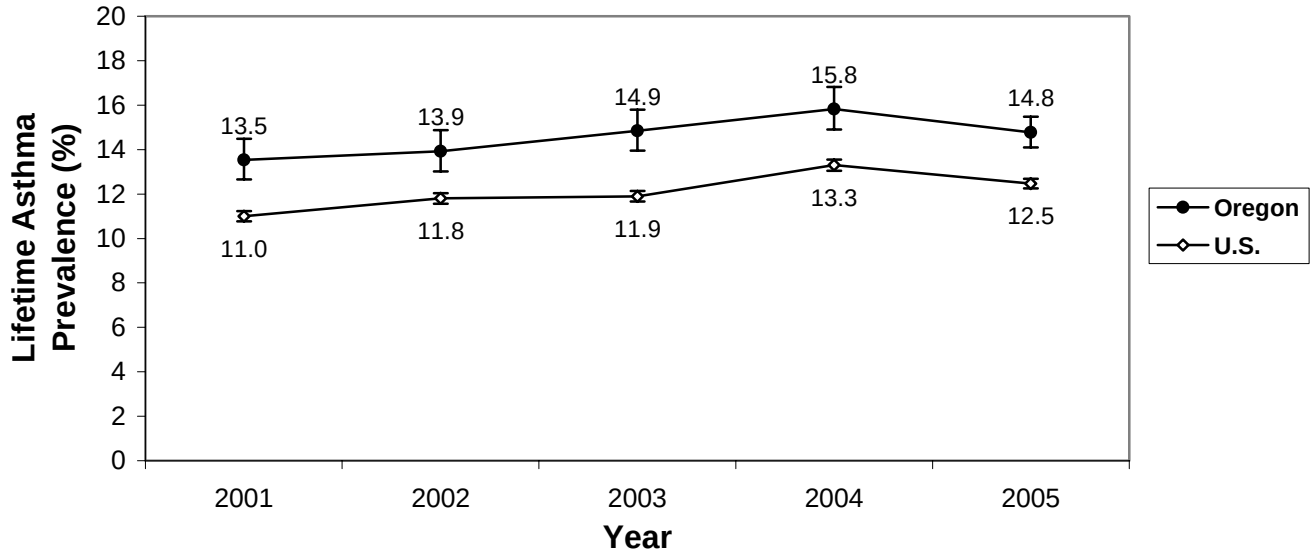
- Have you ever been told by a doctor, nurse, or other health professional that you have asthma? (**lifetime asthma**)
- Do you still have asthma? (**current asthma**)

Note that all of the graphs in this section include prevalence estimates and error bars indicating the 95% confidence intervals.

Key Findings

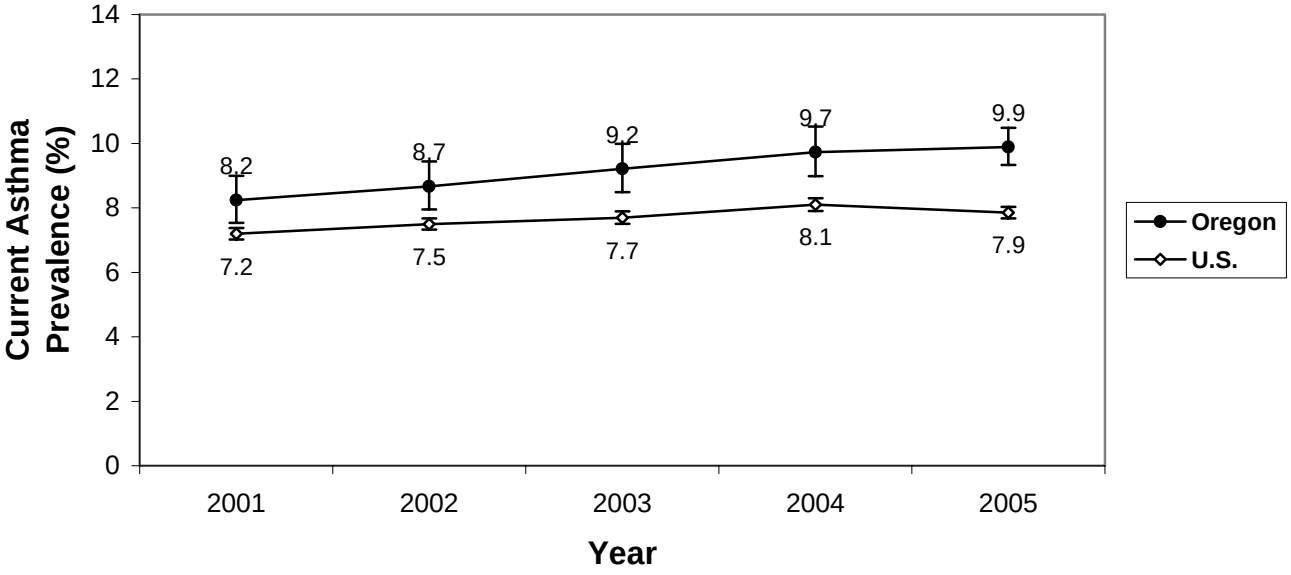
- Current asthma prevalence for adults in Oregon was 9.9% in 2005 and is considerably higher than the U.S. average of 7.9%.
- Current asthma prevalence in 2005 was higher for women (12.4%) than men (7.4%).
- The 2004-2005 prevalence of current asthma varies by race/ethnicity with the highest prevalence among non-Hispanic Blacks (16.5%) and non-Hispanic American Indians or Alaska Natives (15.3%), followed by non-Hispanic Whites (10.1%), non-Hispanic Asians or Pacific Islanders (6.4%), and Hispanics (4.9%).
- In 2005, current asthma prevalence was highest in people aged 18-24 years (13.5%), relatively similar across 10-year age spans for people aged 25-64 years (range 9.4 to 9.8%), and lower in people aged 65 or older (8.2%).
- The prevalence of current asthma in 2005 was highest among people who reported annual income of less than $25,000.
- Based on 2005 data, the prevalence of current asthma in the Medicaid population (20.7%) was more than double that of people with private or Medicare insurance (9.2%) or no health insurance (9.4%).
- The 2002-2005 prevalence of current asthma differs among Oregon counties from a low of 2.8% in Gilliam/Wheeler counties to a high of 11.9% in Linn County.

Figure 1 Lifetime asthma prevalence in adults for Oregon and the U.S., 2001-2005



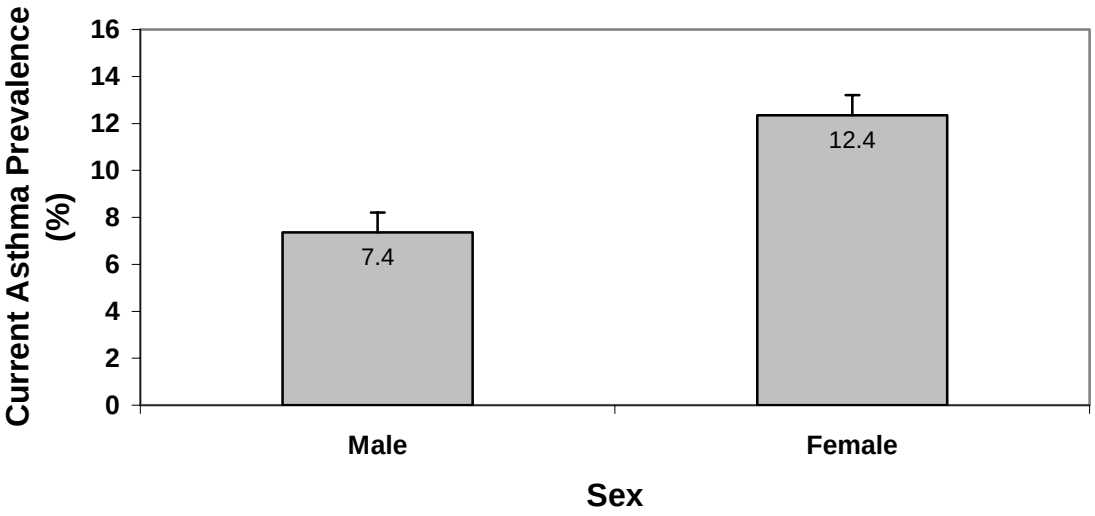
Source: Oregon BRFSS and U.S. BRFSS, 2001-2005
Note: Error bars represent 95% confidence intervals

Figure 2 Current asthma prevalence in adults for Oregon and the U.S., 2001-2005



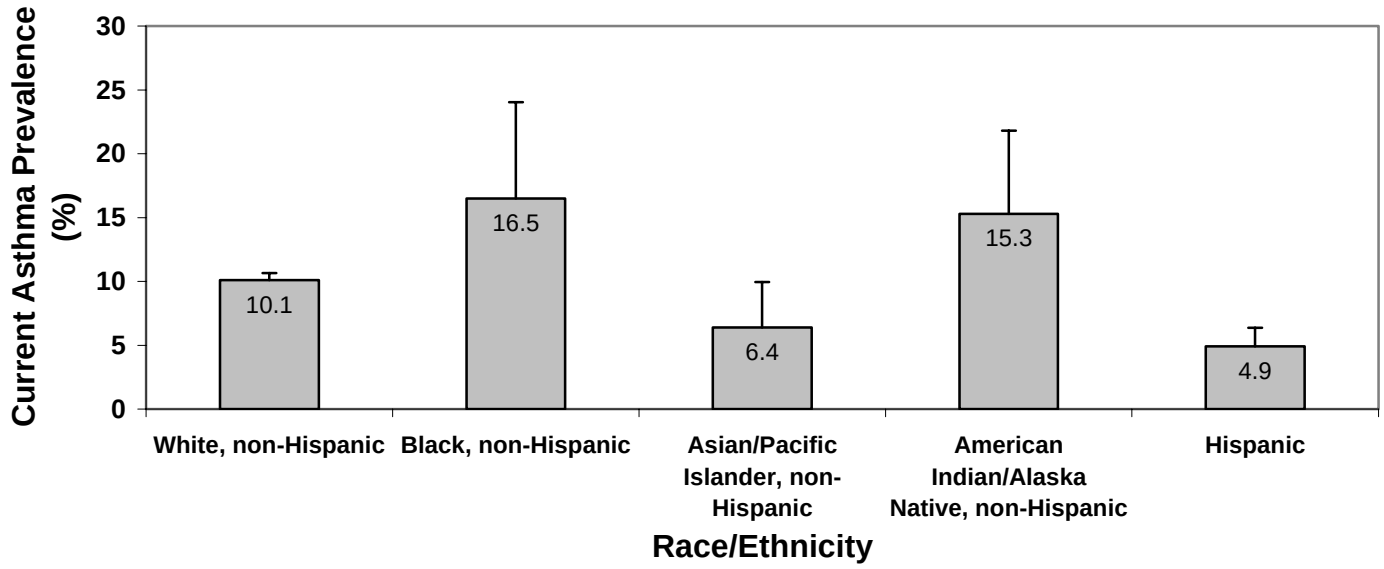
Source: Oregon BRFSS and U.S. BRFSS, 2001-2005
Note: Error bars represent 95% confidence intervals

Figure 3 Current asthma prevalence by sex, Oregon adults, 2005



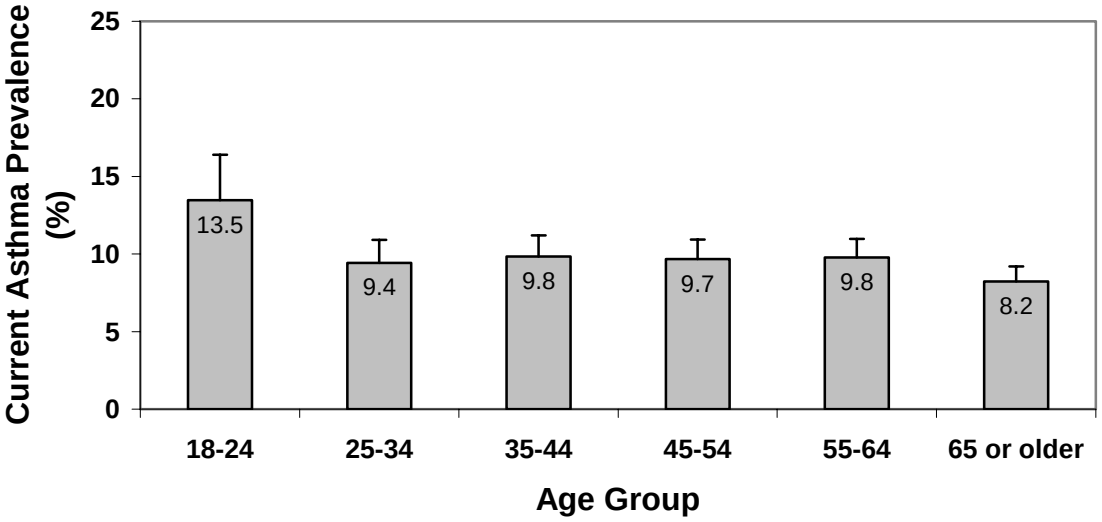
Source: Oregon BRFSS, 2005
Note: Error bars represent 95% confidence intervals

Figure 4 Current asthma prevalence by race/ethnicity, Oregon adults, 2004-2005



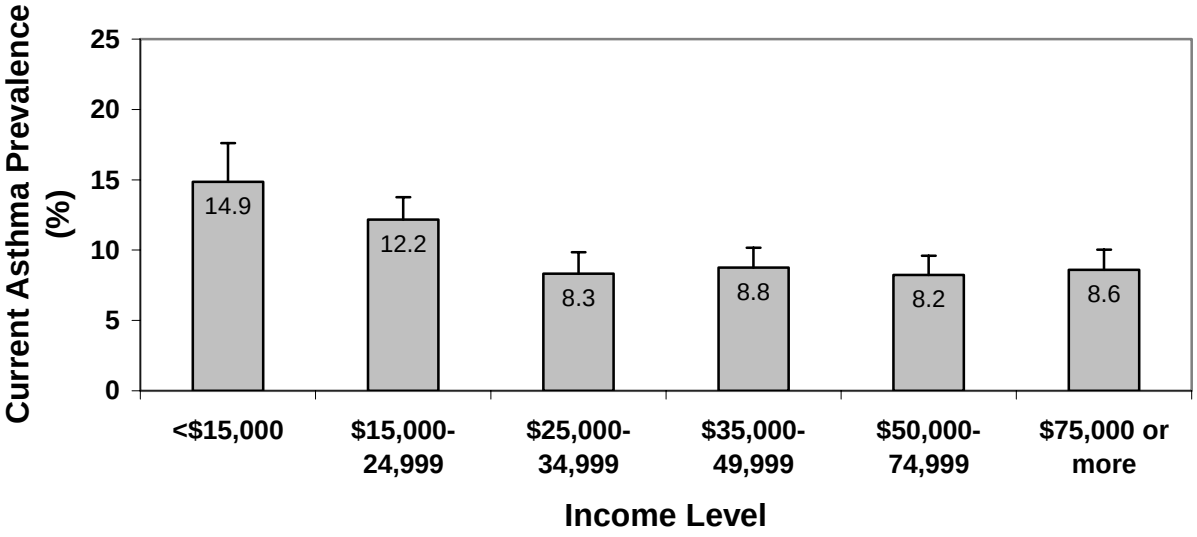
Source: Oregon BRFSS, 2004-2005
Note: Error bars represent 95% confidence intervals

Figure 5 Current asthma prevalence by age, Oregon adults, 2005



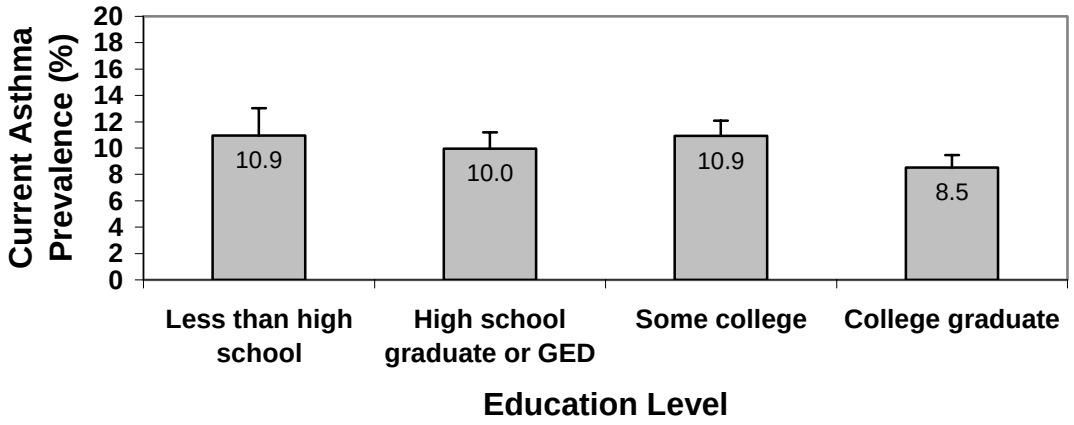
Source: Oregon BRFSS, 2005
Note: Error bars represent 95% confidence intervals

Figure 6 Current asthma prevalence by income, Oregon adults, 2005



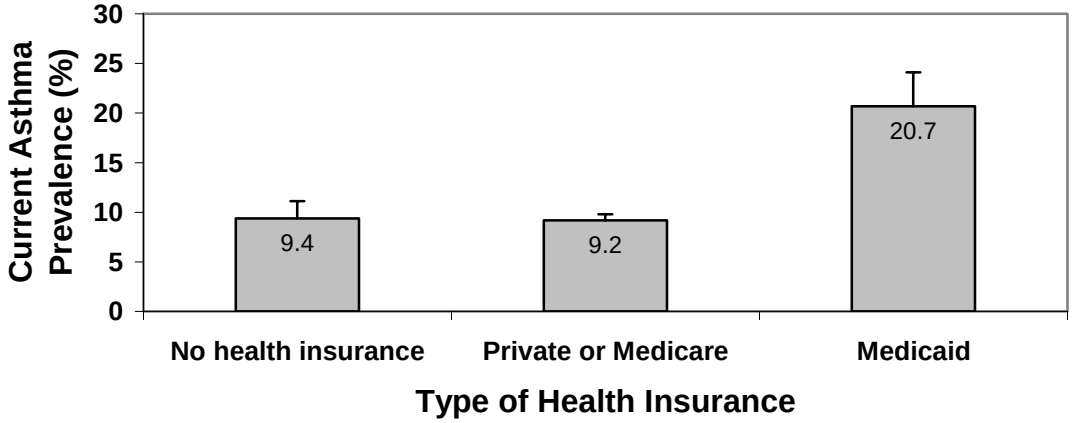
Source: Oregon BRFSS, 2005
Note: Error bars represent 95% confidence intervals

Figure 7 Current asthma prevalence by education level, Oregon adults, 2005



Source: Oregon BRFSS, 2005
Note: Error bars represent 95% confidence intervals

Figure 8 Current asthma prevalence by type of health insurance, Oregon adults, 2005



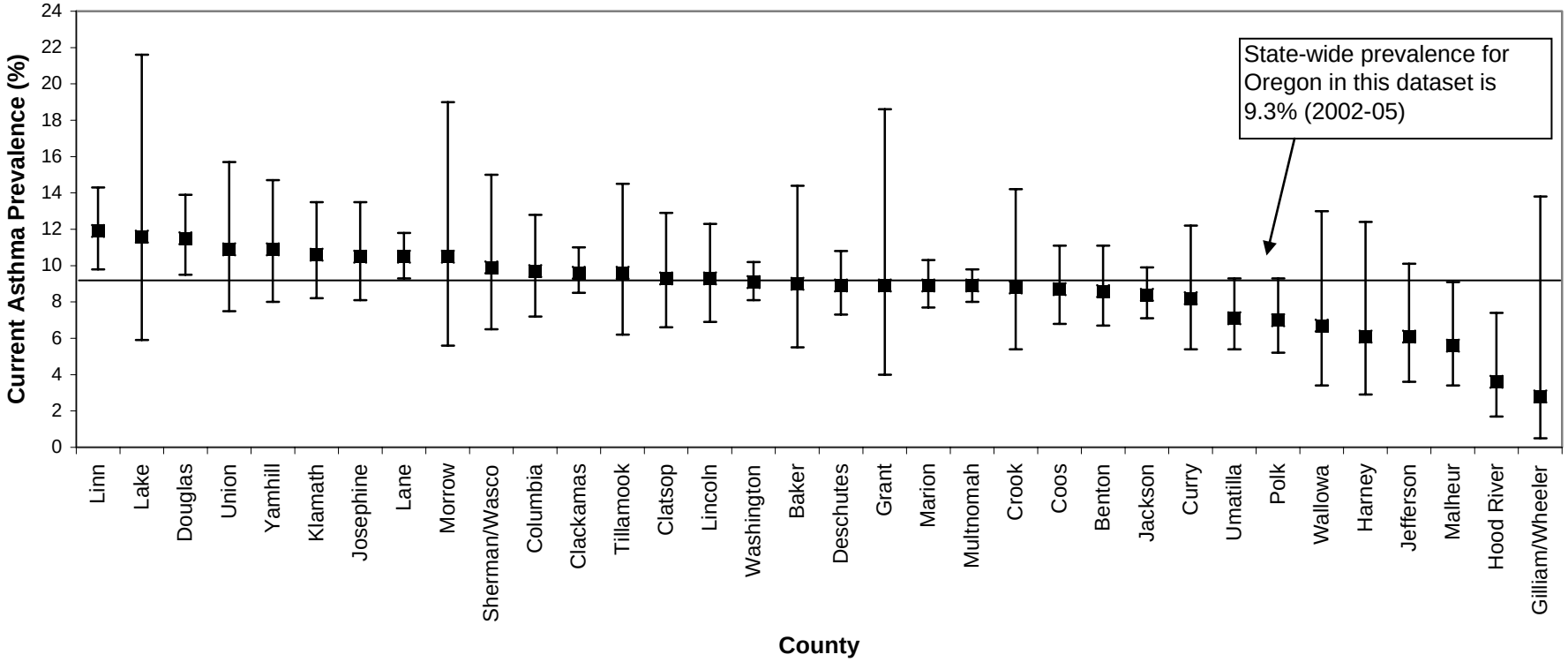
Source: Oregon BRFSS, 2005
Note: Error bars represent 95% confidence intervals

Table 1 Current asthma prevalence by county, Oregon adults, 2002-2005

County	Current Asthma Prevalence (%)	95% Confidence Intervals (lower-upper)
Baker	9.0%	5.5-14.4%
Benton	8.6%	6.7-11.1%
Clackamas	9.6%	8.5-11.0%
Clatsop	9.3%	6.6-12.9%
Columbia	9.7%	7.2-12.8%
Coos	8.7%	6.8-11.1%
Crook	8.8%	5.4-14.2%
Curry	8.2%	5.4-12.2%
Deschutes	8.9%	7.3-10.8%
Douglas	11.5%	9.5-13.9%
Grant	8.9%	4.0-18.6%
Harney	6.1%	2.9-12.4%
Hood River	3.6%	1.7-7.4%
Jackson	8.4%	7.1-9.9%
Jefferson	6.1%	3.6-10.1%
Josephine	10.5%	8.1-13.5%
Klamath	10.6%	8.2-13.5%
Lake	11.6%	5.9-21.6%
Lane	10.5%	9.3-11.8%
Lincoln	9.3%	6.9-12.3%
Linn	11.9%	9.8-14.3%
Malheur	5.6%	3.4-9.1%
Marion	8.9%	7.7-10.3%
Morrow	10.5%	5.6-19.0%
Multnomah	8.9%	8.0-9.8%
Polk	7.0%	5.2-9.3%
Tillamook	9.6%	6.2-14.5%
Umatilla	7.1%	5.4-9.3%
Union	10.9%	7.5-15.7%
Wallowa	6.7%	3.4-13.0%
Washington	9.1%	8.1-10.2%
Yamhill	10.9%	8.0-14.7%
Gilliam/Wheeler	2.8%	0.5-13.8%
Sherman/Wasco	9.9%	6.5-15.0%

Source: Oregon BRFSS, 2002-2005

Figure 9 Current asthma prevalence and associated 95% confidence intervals by county, Oregon adults, 2002-05



Source: Oregon BRFSS, 2002-2005
Note: Error bars represent 95% confidence intervals

Pediatric Asthma

To assess asthma prevalence in children, Oregon relies primarily on two sources: information provided during the BRFSS survey by an adult on behalf of a child who lives in the same household as the respondent, and self-reported information from students in the 8th and 11th grades who participate in the Oregon Healthy Teens (OHT) survey. Currently, the asthma section of the OHT survey includes the following prevalence questions:

- Has a doctor or nurse ever told you that you have asthma? (**lifetime asthma**)
- Do you still have asthma? (**current asthma**)

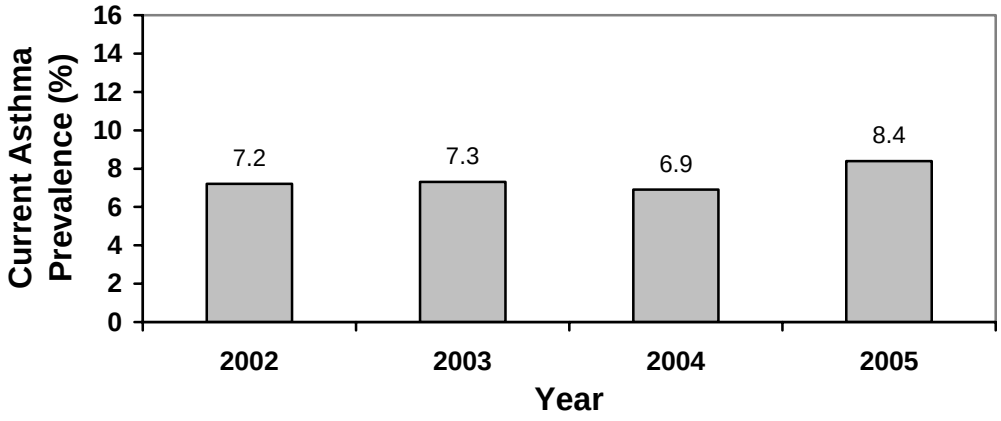
In addition to asthma prevalence, we also collect information on asthma episodes or attacks, missed days of school due to asthma, and difficulty sleeping due to asthma through the following questions on the OHT survey:

- During the past 12 months, have you had an episode of asthma or an asthma attack?
- During the past 30 days, how many days of school did you miss because of your asthma?
- During the past 30 days, how many nights did symptoms of asthma make it difficult for you to stay asleep?

Key Findings

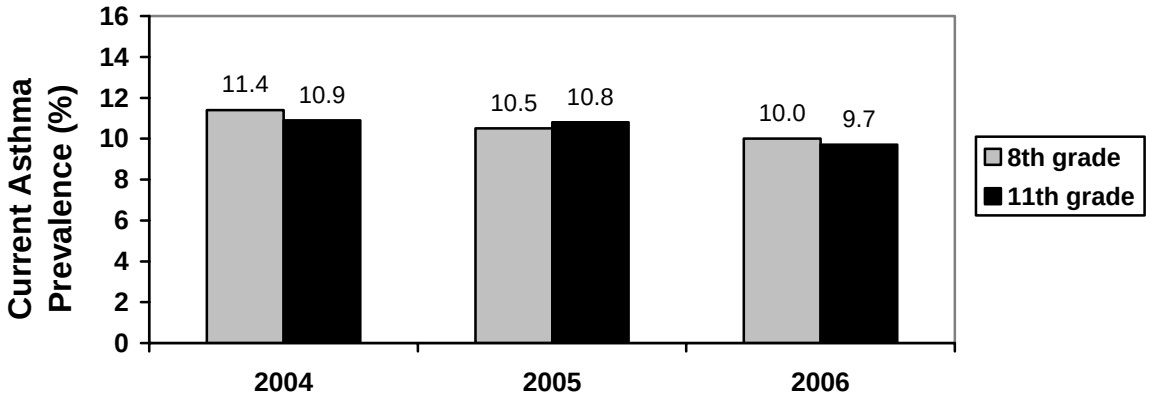
- Based on the 2005 BRFSS, lifetime asthma prevalence was 13.2% and current asthma prevalence was 8.4% for children age 0-17 years in Oregon.
- The 2006 prevalence of current asthma is similar for 8th (10.0%) and 11th (9.7%) graders, and asthma prevalence has decreased from 2004 to 2006 for both age groups.
- In 2006, approximately 9% of Oregon 8th and 11th grade students reported having had an asthma episode or asthma attack in the past 12 months.
- Of Oregon students with current asthma, 14% of 8th graders and 9% of 11th graders reported missing at least one day of school because of asthma in the past 30 days in 2006.
- In 2006, 29-36% of 8th and 11th grade students with current asthma reported difficulty sleeping due to asthma for 1-3 nights in the past 30 days. An additional 10-12% reported difficulty sleeping for 4 or more nights in the past 30 days.

Figure 10 Current asthma prevalence* by year, Oregon children 0-17 years of age by adult proxy, 2002-2005



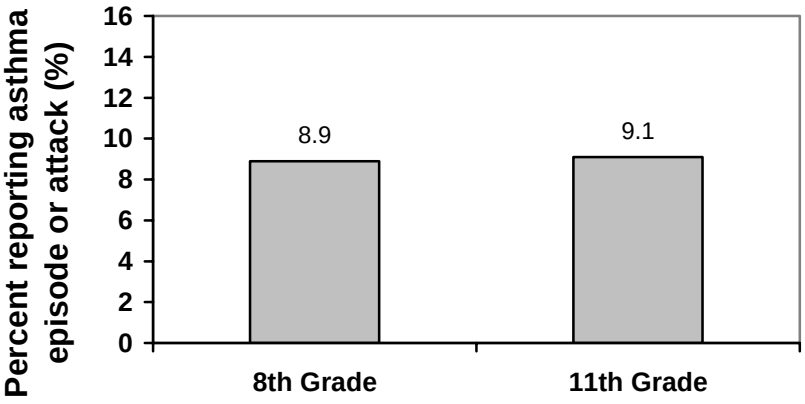
* The method for calculating current asthma prevalence among children changed from 2004 to 2005.
Source: Oregon BRFSS, 2002-2005

Figure 11 Current asthma prevalence among Oregon 8th grade and 11th grade students, 2004-2006



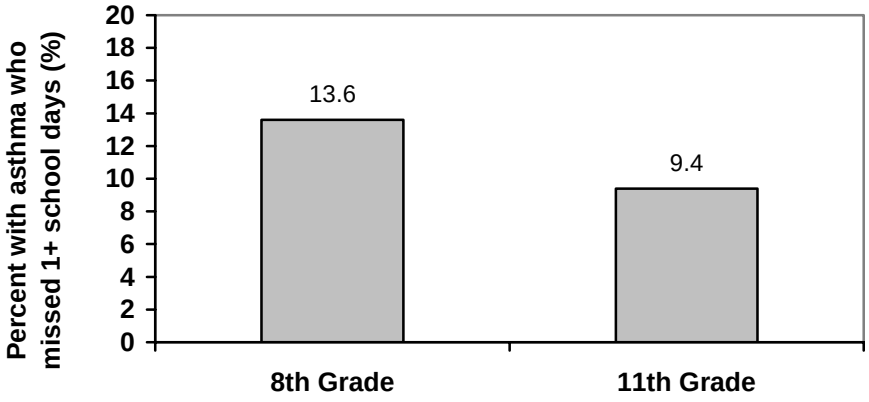
Source: Oregon Healthy Teens survey, 2004-2006

Figure 12 Percentage of Oregon 8th and 11th grade students who have had an episode of asthma or an asthma attack in the past 12 months, 2006



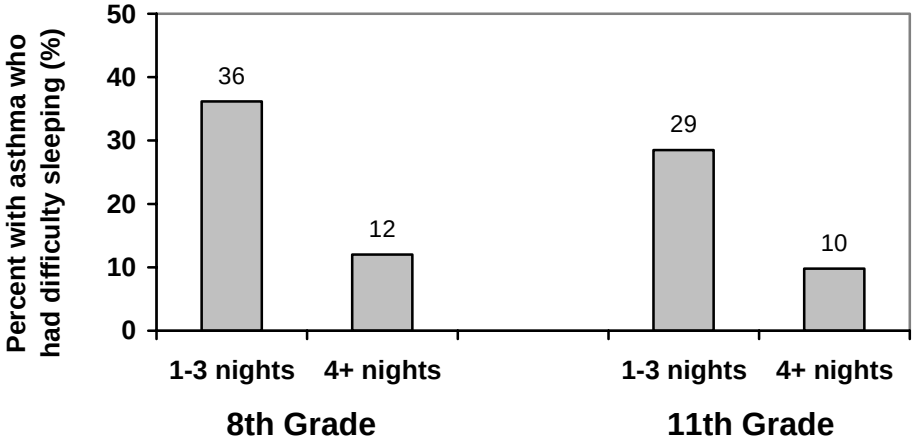
Source: Oregon Healthy Teens survey, 2006

Figure 13 Percentage of Oregon 8th and 11th grade students with current asthma who missed at least one day of school because of asthma in the past 30 days, 2006



Source: Oregon Healthy Teens survey, 2006

Figure 14 Percentage of Oregon 8th and 11th grade students with current asthma who had difficulty sleeping due to asthma symptoms for 1-3 nights or 4 or more nights in the past 30 days, 2006



Source: Oregon Healthy Teens survey, 2006

Emergency Department or Urgent Care Visits for Asthma

The percentage of Oregonians with asthma who have visited an emergency department (ED) or an urgent care center for asthma in the past year is assessed through the Behavioral Risk Factor Surveillance System (BRFSS). This question is worded as follows on the BRFSS:

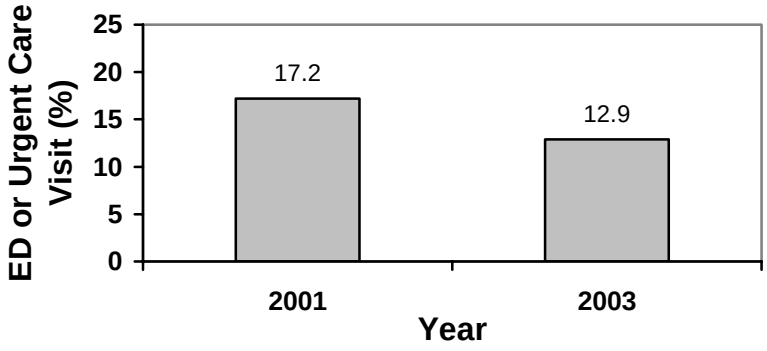
- During the past 12 months, how many times did you visit an emergency room or urgent care center because of your asthma?

We also monitor ED visits through the Asthma Data Workgroup (ADWG) and the Oregon Division of Medical Assistance Programs-Quality and Performance Improvement Workgroup (DMAP-QPIWG). The ADWG is a collaboration between the Oregon Asthma Program (OAP) and several of Oregon's largest commercial and Medicaid health plans. The DMAP-QPIWG is a workgroup convened by DMAP for all health plans that serve Medicaid recipients in Oregon. Through these collaborations, we are able to measure and report asthma data consistently across health plans. In 2005, the aggregate data were derived from the claims and encounter records of more than 550,000 insured Oregonians aged 4-55 years from 14 different health plans who had at least six months of continuous enrollment in a participating health plan. As such, these data represent about 20% of the Oregon population.

Key Findings

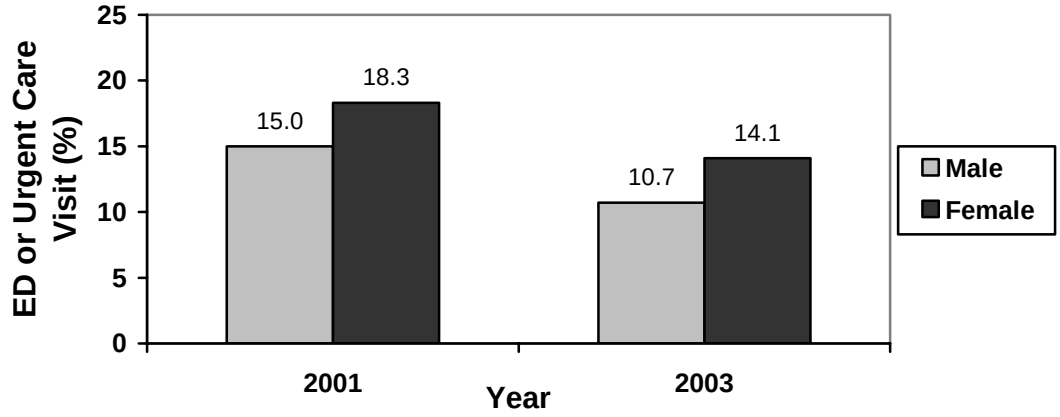
- Behavioral Risk Factor Surveillance System (BRFSS)
    - The percentage of Oregonians with asthma who have visited an ED or urgent care center in the past 12 months decreased between 2001 (17.2%) and 2003 (12.9%).
    - In 2003, among those with asthma, females (14.1%) were more likely than males (10.7%) to have an ED or urgent care visit for asthma in the past 12 months.
    - In 2003, Oregonians with asthma who were covered by Medicaid (23.6%) were more likely than people with no health insurance (5.1%) or people with private or Medicare insurance (13.1%) to have an ED or urgent care visit for asthma in the past 12 months.
- Asthma Data Workgroup (ADWG) and Oregon Division of Medical Assistance Programs-Quality and Performance Improvement Workgroup (DMAP-QPIWG)
    - From 2001 to 2005, the percentage of people with asthma who had an ED visit for asthma in the past 12 months is stable or decreasing.
    - From 2001 to 2005, Oregon Medicaid recipients with asthma were twice as likely to have an ED visit for asthma in the past 12 months as people with commercial health insurance.
    - Of Oregonians with asthma insured through Medicaid or commercial health plans, about 40% of those who had an ED visit for asthma had a follow-up outpatient visit within 30 days of the ED visit from 2001-05.

Figure 15 Percentage of Oregon adults with current asthma, by year, who reported one or more emergency department or urgent care visits for asthma in the past 12 months, 2001 and 2003



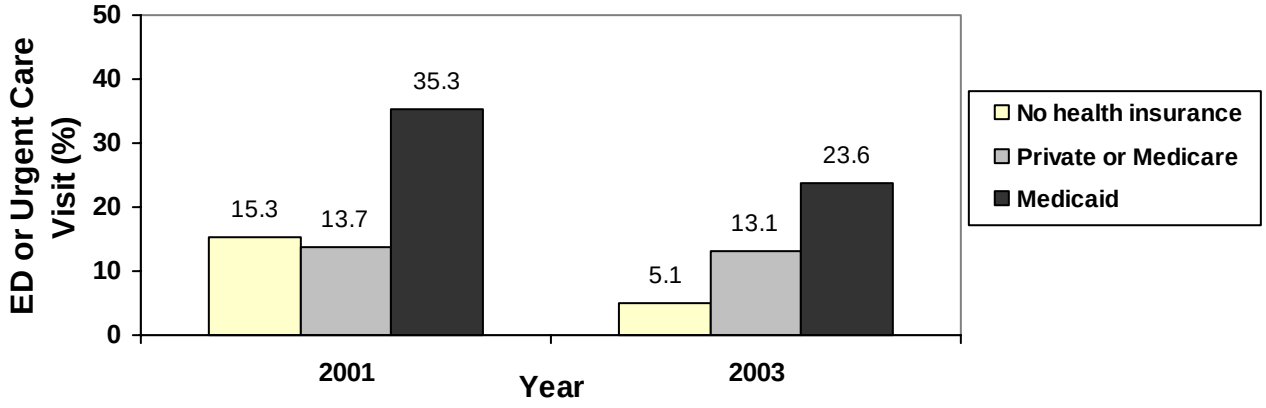
Source: BRFSS, 2001, 2003

Figure 16 Percentage of Oregon adults with current asthma, by sex and year, who reported one or more emergency department or urgent care visits for asthma in the past 12 months, 2001 and 2003



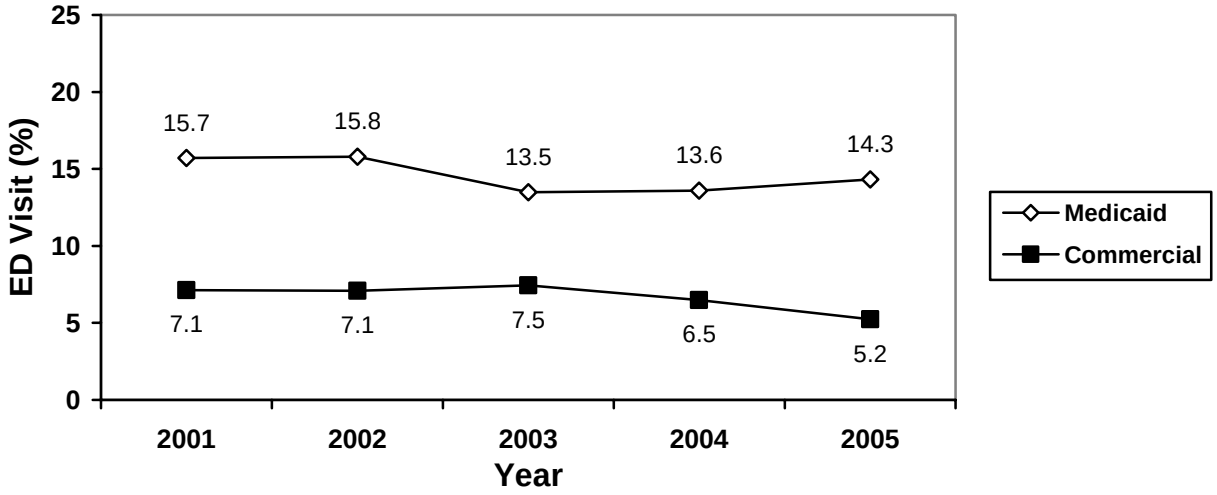
Source: BRFSS, 2001, 2003

Figure 17 Percentage of Oregon adults with current asthma, by type of insurance and year, who reported one or more emergency department or urgent care visits for asthma in the past 12 months, 2001 and 2003



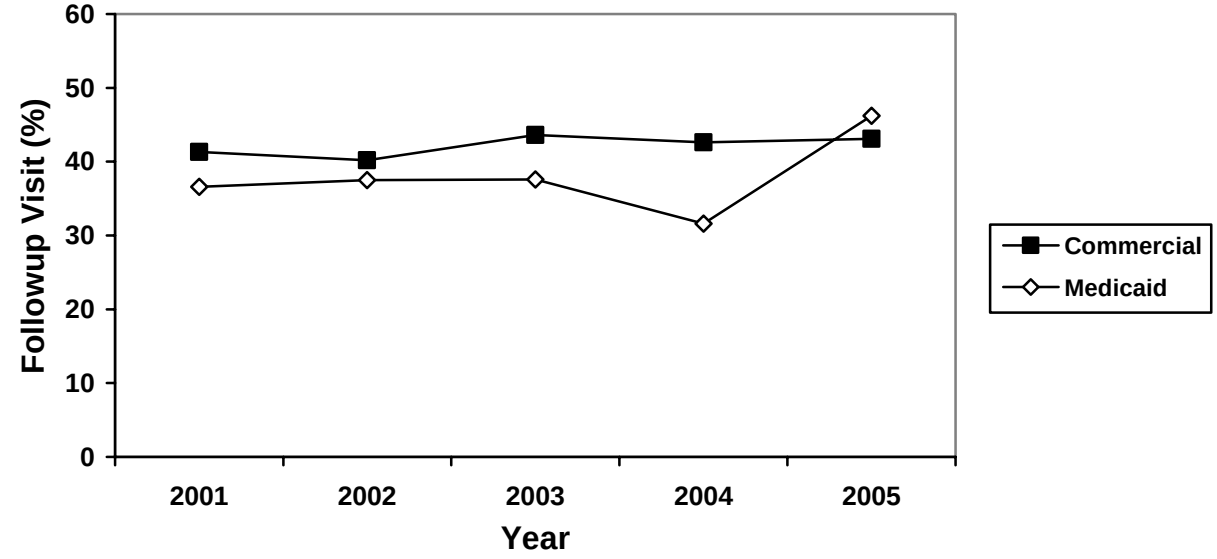
Source: BRFSS, 2001, 2003

Figure 18 Percentage of health plan members age 4-55 years with asthma, by plan type and year, who had one or more emergency department visits for asthma in the past 12 months, 2001-2005



Source: ADWG and DMAP-QPIWG, 2001-2005

Figure 19 Percentage of health plan members age 4-55 years with asthma who had a follow-up outpatient visit within 30 days of an emergency department visit for asthma, by plan type and year, 2001-2005



Source: ADWG and DMAP-QPIWG, 2001-2005

Asthma Hospitalizations

The rate of asthma hospitalizations per 10,000 Oregon residents is monitored through the Oregon Hospital Discharge Index, which is provided by the Oregon Association of Hospitals and Health Systems. Data from 1997-2005 have been analyzed and the results are provided below.

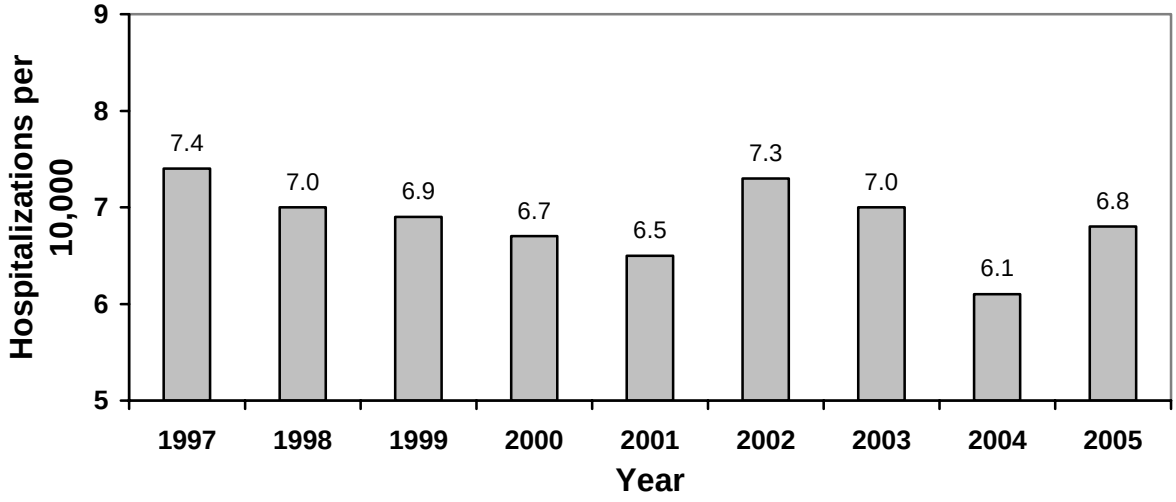
The Hospital Discharge Index provides information on hospital discharges from all acute care hospitals in Oregon except two Veterans Administration hospitals. The dataset includes information on the dates of admission and discharge, principal and additional diagnosis and procedure codes, financial charges, primary payer, and limited patient demographic information (e.g., includes gender but not race/ethnicity). Unique identifiers are not available in this dataset; therefore, we can monitor the number of asthma hospitalizations that occur but not the number of people who are hospitalized for asthma.

An asthma hospitalization is defined as having a primary diagnosis with an International Classification Disease 9th Revision Clinical Modification (ICD-9-CM) code of 493. When possible, the hospitalization rates presented below have been age-adjusted to the U.S. 2000 standard population.

Key Findings

- In 2005, there were 2,446 asthma hospitalizations in Oregon.
- Asthma hospitalizations in Oregon cost approximately $23.5 million in 2005.
- The Oregon asthma hospitalization rate varies by year but has generally decreased during 1997-2005. The lowest rate occurred in 2004 (6.1 hospitalizations per 10,000 residents).
- Despite Oregon's higher asthma prevalence, Oregon asthma hospitalization rates are lower than the U.S. rate and in 2004 were lower than the Healthy People 2010 targets.
- Oregon asthma hospitalization rates in 2005 differ by age with the highest rates in children <5 years old and adults ≥80 years old.
- The rate of asthma hospitalizations is higher for females than males except in children <15 years old.
- The number of asthma hospitalizations varies by season with more in the winter months and fewer in the summer months.

Figure 20 Age-adjusted hospitalization rate per 10,000 residents in which asthma was the primary discharge diagnosis, 1997-2005



Source: Oregon Hospital Discharge Index, 2001-2005

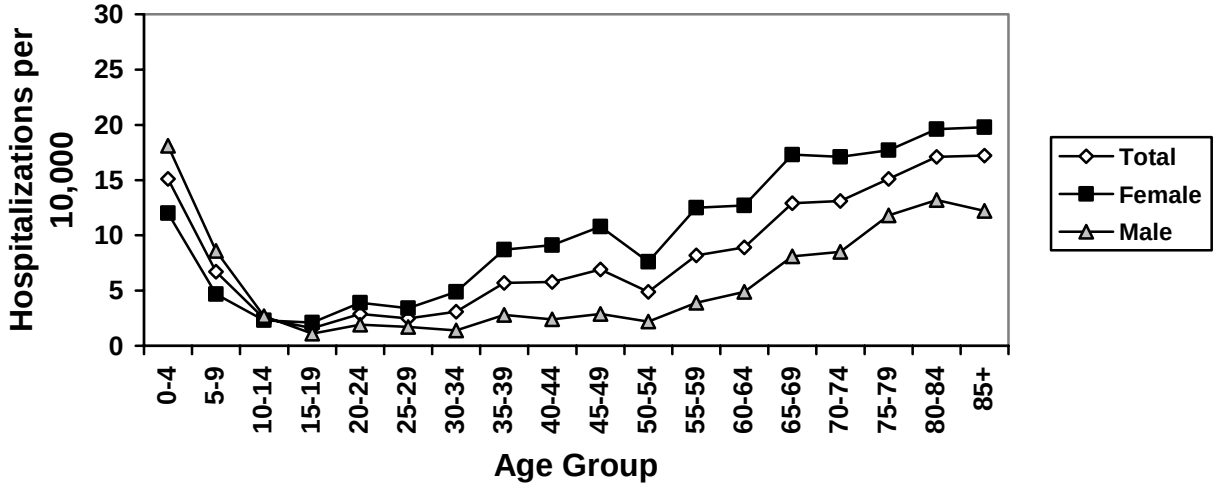
Table 2 Oregon, U.S., and Healthy People 2010 target asthma hospitalization rates*

Age Group (years)	U.S., 1998 (Hospitalizations per 10,000)	Oregon, 1997 (Hospitalizations per 10,000)	Oregon, 2005 (Hospitalizations per 10,000)	Healthy People 2010 (Hospitalizations per 10,000)
0-4	45.6	19.8	15.1	25.0
5-64*	12.5	5.7	4.8	7.7
65 and older*	17.7	11.8	14.5	11.0

* Age-adjusted rates for age groups of 5-64 years and 65 years or older.

Sources: Oregon Hospital Discharge Index, 2001-2005; National Hospital Discharge Survey, 1998 as reported in 2010 targets at http://www.healthypeople.gov/document/HTML/Volume2/24Respiratory.htm#_Toc489704825

Figure 21 Hospitalization rate (per 10,000 residents), by sex and age group, with asthma as the primary discharge code, 2005



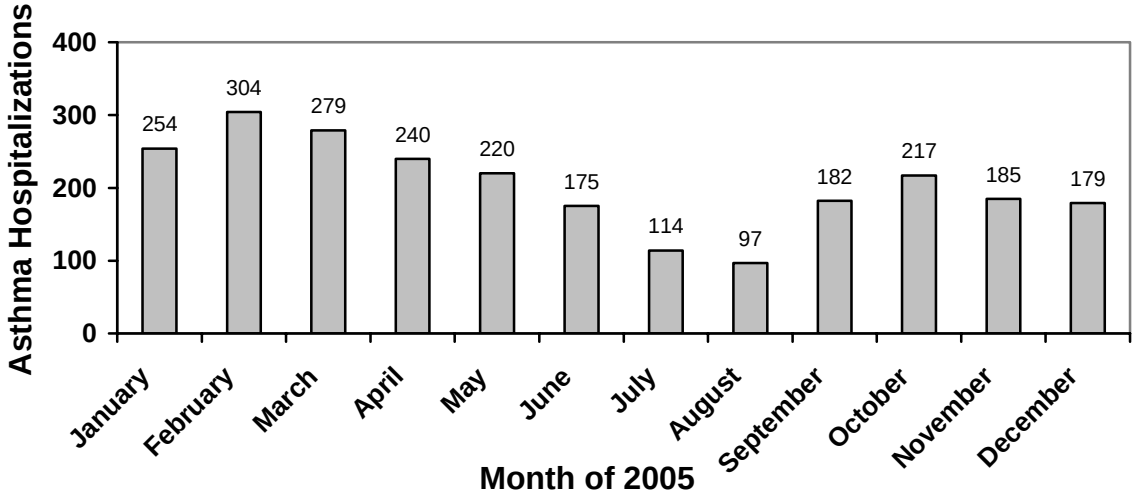
Source: Oregon Hospital Discharge Index, 2001-2005

Table 3 Age-adjusted asthma hospitalization rate* by county, aggregated 2001 through 2005

County	Age-adjusted hospitalization rate (per 10,000 county residents)	Number of hospitalizations for asthma, 2001-2005
Baker	4.2	38
Benton	3.1	107
Clackamas	5.1	864
Clatsop	9.1	159
Columbia	7.4	165
Coos	13.5	438
Crook	7.8	82
Curry	10.0	120
Deschutes	5.3	334
Douglas	11.8	625
Gilliam	10.1	10
Grant	5.4	23
Harney	20.8	85
Hood River	2.7	28
Jackson	8.1	791
Jefferson	11.1	115
Josephine	8.4	366
Klamath	8.7	291
Lake	11.8	49
Lane	6.0	955
Lincoln	7.1	162
Linn	8.2	435
Malheur	4.1	67
Marion	4.8	703
Morrow	7.0	39
Multnomah	7.8	2,574
Polk	3.6	116
Sherman	21.8	24
Tillamook	8.3	119
Umatilla	6.1	219
Union	8.7	106
Wallowa	7.9	33
Wasco	9.5	125
Washington	5.1	1,174
Wheeler	8.3**	8
Yamhill	7.2	312
Total for Oregon	6.7	11,861

* Rates are calculated per 10,000 county residents for hospitalizations in which asthma was the primary discharge diagnosis.
** Rate may not be reliable when there are <10 hospitalizations for asthma in a county.
Source: Oregon Hospital Discharge Index, 2001-2005

Figure 22 Number of hospitalizations due to asthma by month in 2005



Source: Oregon Hospital Discharge Index, 2005

Asthma Mortality

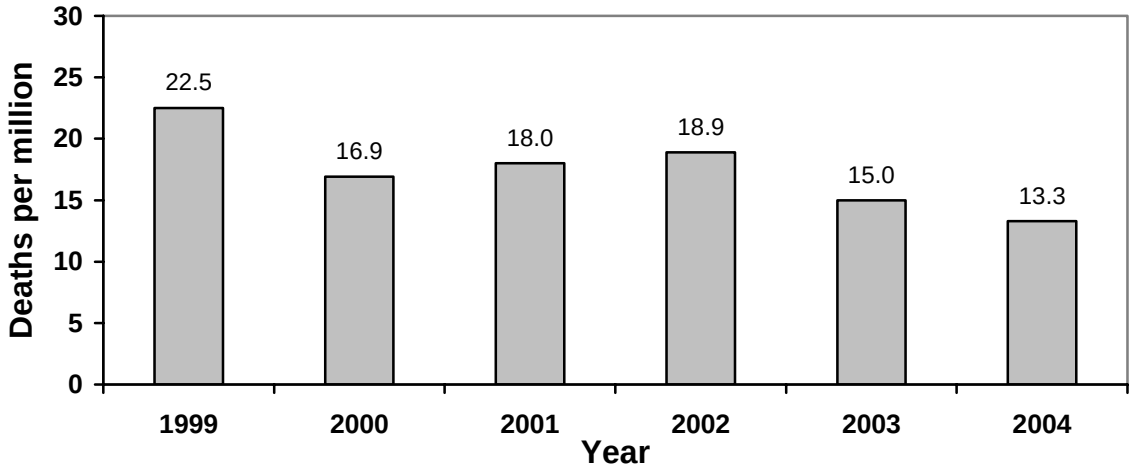
Compared to hospitalizations, there are very few deaths due to asthma each year. Asthma mortality is monitored through Oregon's Death Certificate Statistical File, which contains information about all deaths occurring in Oregon and deaths occurring out-of-state among Oregon residents.

An asthma death is defined as having asthma listed as the underlying (principal) cause of death. When possible, the mortality rates presented below have been age-adjusted to the U.S. 2000 standard population. For comparability, state and national age-adjusted rates may be obtained from the Centers for Disease Control and Prevention (CDC) *Wonder* data system at http://wonder.cdc.gov.

Key Findings

- In 2004, there were 49 deaths (13.3 per million) attributed to asthma in Oregon.
- Overall, Oregon's asthma mortality rate has decreased 41% between 1999 and 2004.
- The mortality rate for females is historically higher than that for males; however, the gap is decreasing and mortality rates were virtually the same for both sexes in 2004.
- Despite Oregon's higher asthma prevalence, Oregon asthma mortality rates are lower than the U.S. rate except in people 65 years or older.
- Comparing asthma mortality rates from 1999-2001 to those from 2002-2004, the Oregon rate decreased in all age groups except children <5 years old; there were no deaths in this age group from 1999-2003 whereas a single death occurred in a child <5 in 2004.
- Oregon's asthma mortality rates during 2002-2004 are below Healthy People 2010 targets for ages 5-14 years (0 per million) and 15-34 years (1.7 per million), but Oregon's rates are above the targets for ages 0-4 years (1.5 per million), 35-64 years (12.5 per million), and 65 years or older (84.9 per million).
- Mortality rates combined from 1999 to 2004 differ somewhat by race/ethnicity; however, the rates for non-White races and ethnicities may not be reliable due to the small numbers of deaths in these groups (i.e., <10 in each non-White group).

Figure 23 Age-adjusted mortality rate per million residents in which asthma was the primary cause of death, 1999-2004



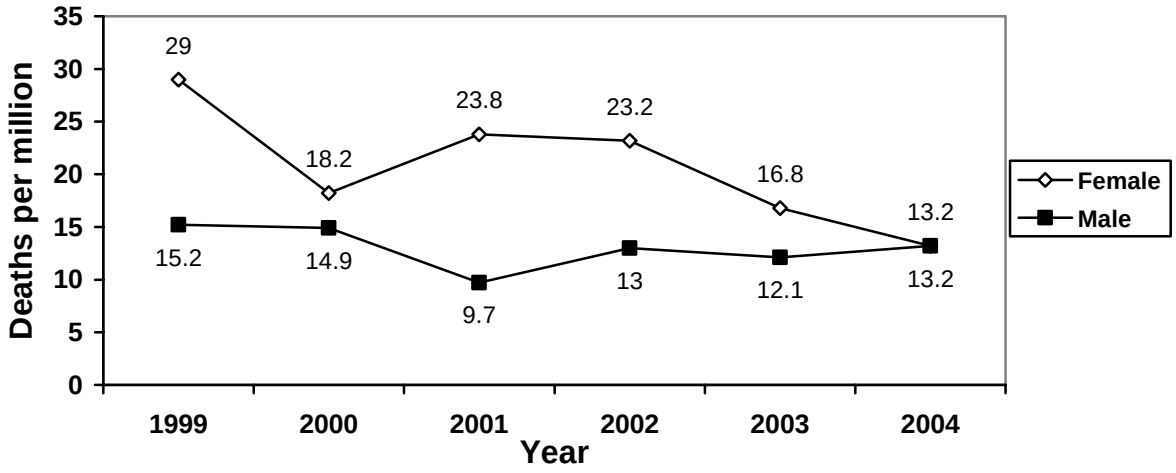
Source: Oregon death certificates, 1999-2004

Table 4 Oregon and U.S. asthma mortality rate per million residents compared to Healthy People 2010 targets for asthma

Age Group (years)	Oregon, 1999-2001 (per million)	Oregon, 2002-2004 (per million)	U.S., 2002 (per million)	Healthy People 2010 (per million)
0-4	0	1.5	2.4	1.0
5-14	0.7	0.0	3.0	1.0
15-34	2.5	1.7	5.0	2.0
35-64	14.0	12.5	14.5	9.0
65+	104.9	84.9	58.1	60.0

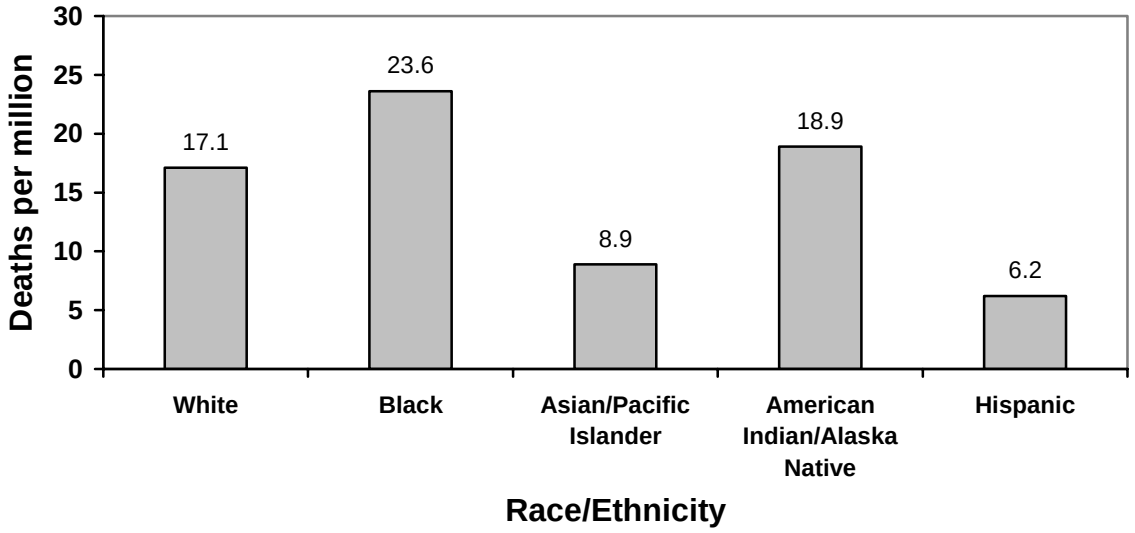
Sources: Oregon death certificates, 1999-2004; National Vital Statistics System, 2002, as reported in 2010 targets at http://www.healthypeople.gov/document/HTML/Volume2/24Respiratory.htm#_Toc489704825.

Figure 24 Age-adjusted mortality rate per million residents in which asthma was the primary cause of death, by sex, 1999-2004



Source: Oregon death certificates, 1999-2004

Figure 25 Age-adjusted mortality rate per million residents from 1999-2004 by race/ethnicity* in which asthma was the primary cause of death



Source: Oregon death certificates, 1999-2004

* The rates for non-White races and ethnicities may not be reliable due to the small numbers of deaths in these groups (i.e., <10 in each non-White group)

Asthma Control

The extent to which people have control of their asthma and asthma symptoms is monitored through Oregon-added questions on the BRFSS and through the BRFSS Asthma Callback Survey. The standard version of the BRFSS administered by all states only asks the lifetime and current asthma prevalence questions discussed in the Asthma Prevalence section. In Oregon, however, we have included additional questions to assess asthma control every two years, beginning in 2001.

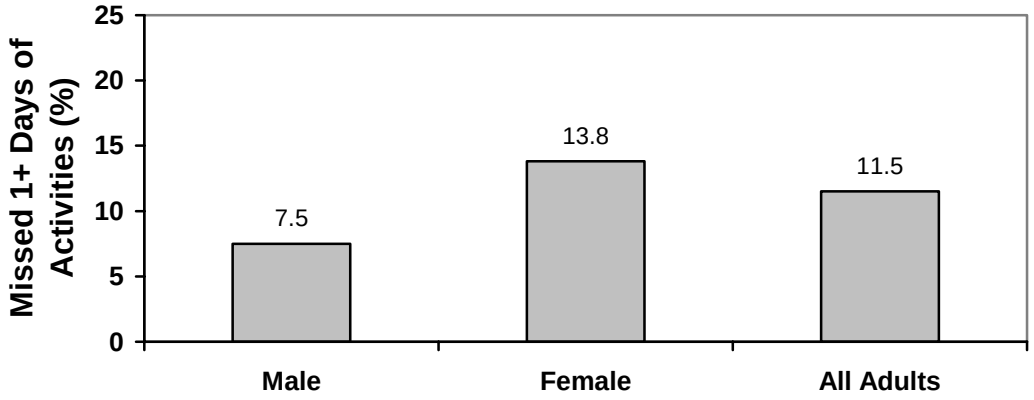
In addition to the BRFSS, Oregon is one of only three states to administer the BRFSS Asthma Callback Survey in 2005. This is an additional callback survey on asthma administered to people who indicated on the BRFSS that they have asthma. The callback survey is very detailed and asks many questions related to asthma such as healthcare utilization, knowledge of asthma, asthma management, asthma medications, environmental factors, costs of asthma care, work-related asthma, co-morbid conditions, and complementary and alternative medicines.

At the time of this report, we have examined preliminary data from the BRFSS Asthma Callback Survey but have not yet finalized the analyses because additional steps are necessary to ensure the data are representative of Oregon's population. For this reason, results from the callback presented below should be treated as preliminary and interpreted with caution.

Key Findings

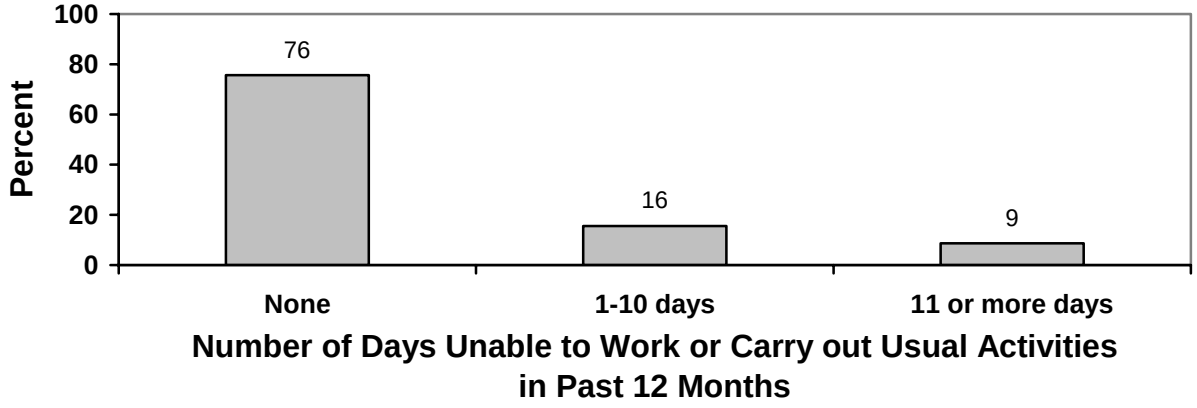
- Behavioral Risk Factor Surveillance System (BRFSS)
    - In 2005, more females (13.8%) than males (7.5%) reported missing one or more days of work, school, or other daily activities due to asthma in the past three months.
    - In 2003, the percentage of people with asthma who reported missing one or more days or work, school, or other daily activities due to asthma in the past three months decreased as income increased.
    - About 22% of people with asthma in 2003 reported three or more sleep disturbances in the past month due to asthma.
    - In 2005, 41% of people with asthma reported some or a moderate degree of limitation of their activities due to asthma. Only 3% reported severe limitations on their activities.
    - Nearly 60% of people with asthma in 2005 reported having asthma symptoms at least once a week in the past 30 days.
    - In 2005, people without asthma were 38% more likely than people with asthma to report very good or excellent health.
- BRFSS Asthma Callback Survey
    - In 2005, 76% of people with asthma did not report missing any work or usual activities in the past 12 months due to asthma. However, 16% missed 1-10 days and 9% missed more than 10 days in the past 12 months due to asthma.

Figure 26 Percentage of adults with current asthma, by sex, who missed one or more days of work, school, or other daily activities because of asthma in the past three months, 2005



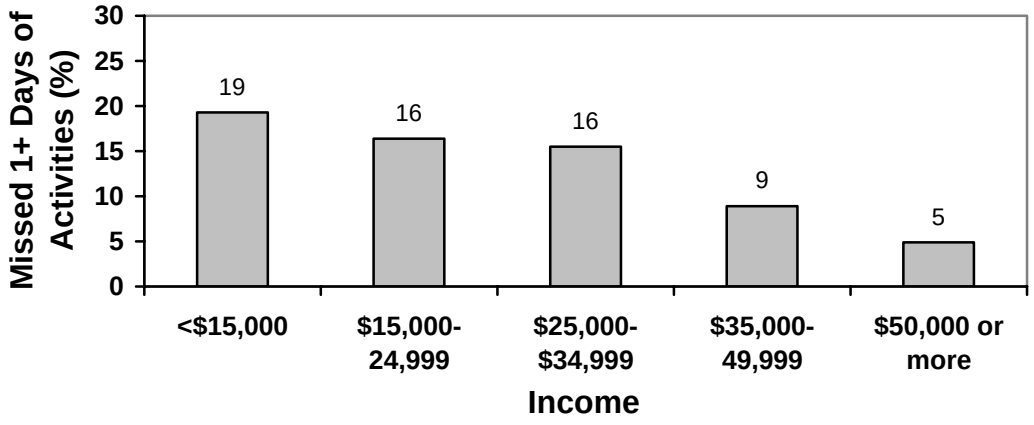
Source: BRFSS, 2005

Figure 27 Number of days in the past 12 months adults with asthma were unable to work or carry out their usual activities because of asthma, 2005



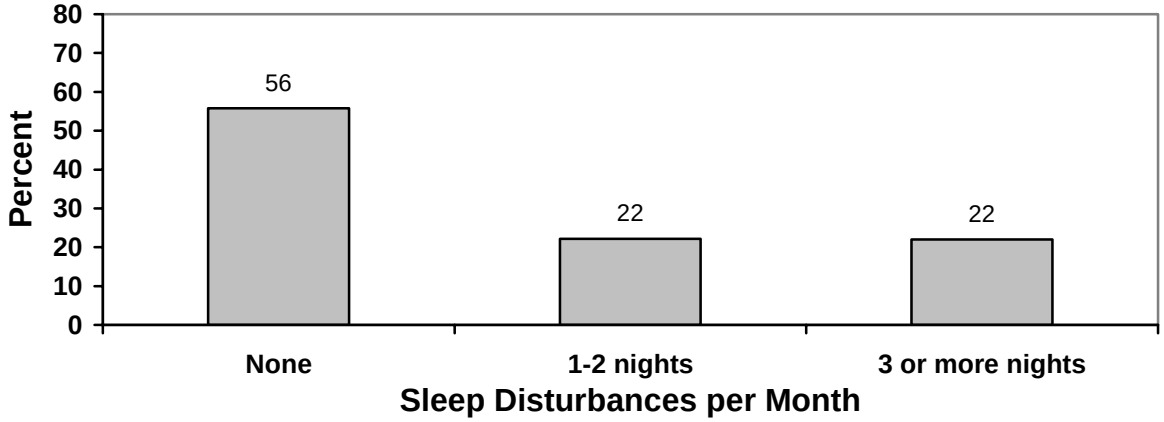
Source: BRFSS Asthma Callback Survey, 2005

Figure 28 Percentage of adults with current asthma, by income, who missed one or more days of work, school, or daily activities because of asthma in the past three months, 2005



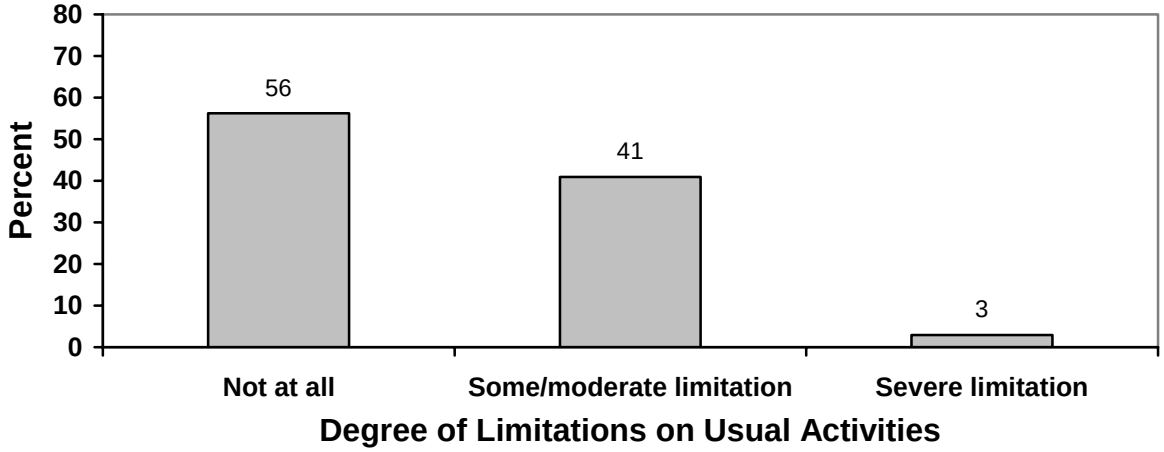
Source: BRFSS, 2005

Figure 29 Number of self-reported sleep disturbances per month due to asthma among adults with asthma, 2003



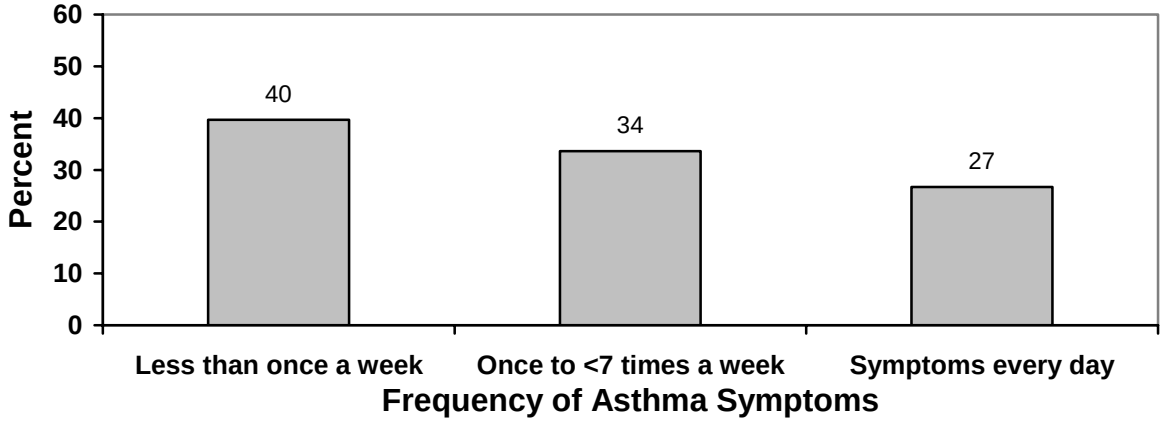
Source: BRFSS, 2003

Figure 30 Degree of self-reported limitations of usual activities among adults with asthma, 2005



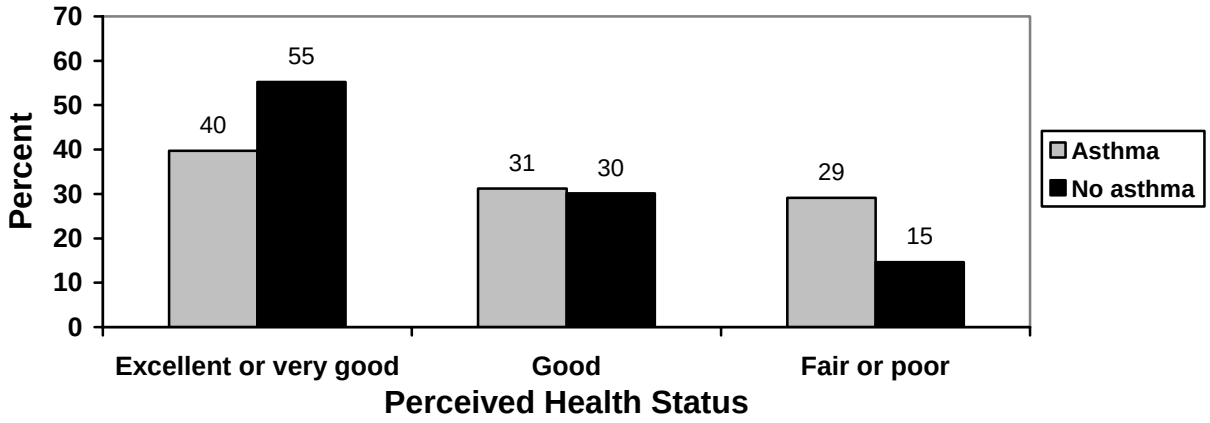
Source: BRFSS, 2005

Figure 31 Frequency of asthma symptoms in past four weeks among adults with asthma, 2005



Source: BRFSS, 2005

Figure 32 Perceived health status among adults with or without asthma, 2005



Source: BRFSS, 2005

Asthma Management

Asthma management refers primarily to the education, instruction, and medical or pharmacological care received by people with asthma. Like asthma control indicators, asthma management indicators are monitored through the BRFSS Asthma Callback Survey, which is a followup survey designed specifically for people with asthma. As mentioned in the previous section, the callback survey is very detailed and asks many questions related to asthma such as healthcare utilization, knowledge of asthma, asthma management, asthma medications, environmental factors, costs of asthma care, work-related asthma, co-morbid conditions, and complementary and alternative medicines.

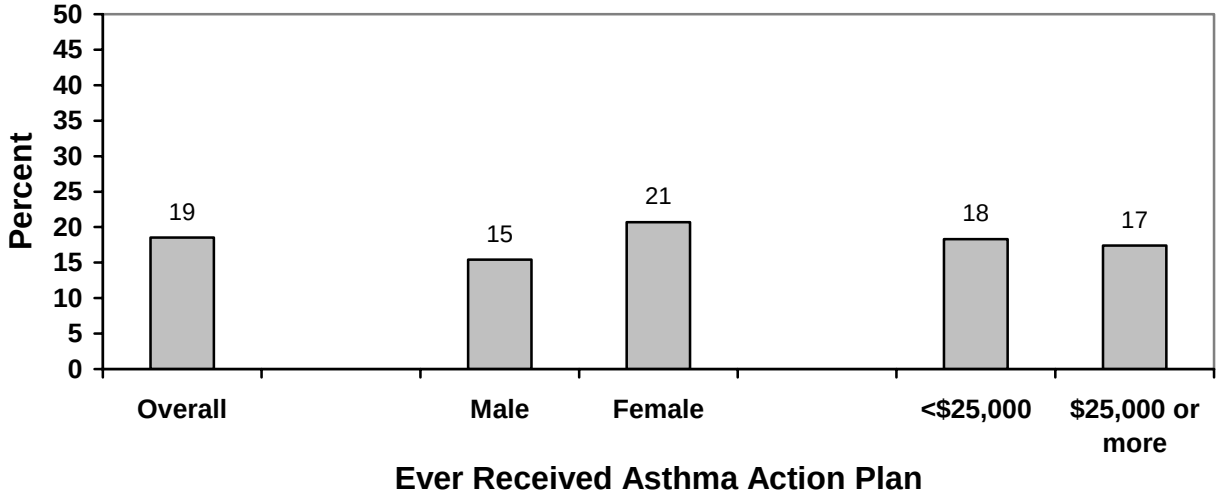
At the time of this report, we have examined preliminary data from the BRFSS Asthma Callback Survey but have not yet finalized the analyses because additional steps are necessary to ensure the data are representative of Oregon's population. For this reason, results from the 2005 callback survey presented below should be treated as preliminary and interpreted with caution.

Asthma management is also monitored through the Asthma Data Workgroup (ADWG), which collects medical and pharmaceutical claims data for more than one million Oregonians with health insurance.

Key Findings

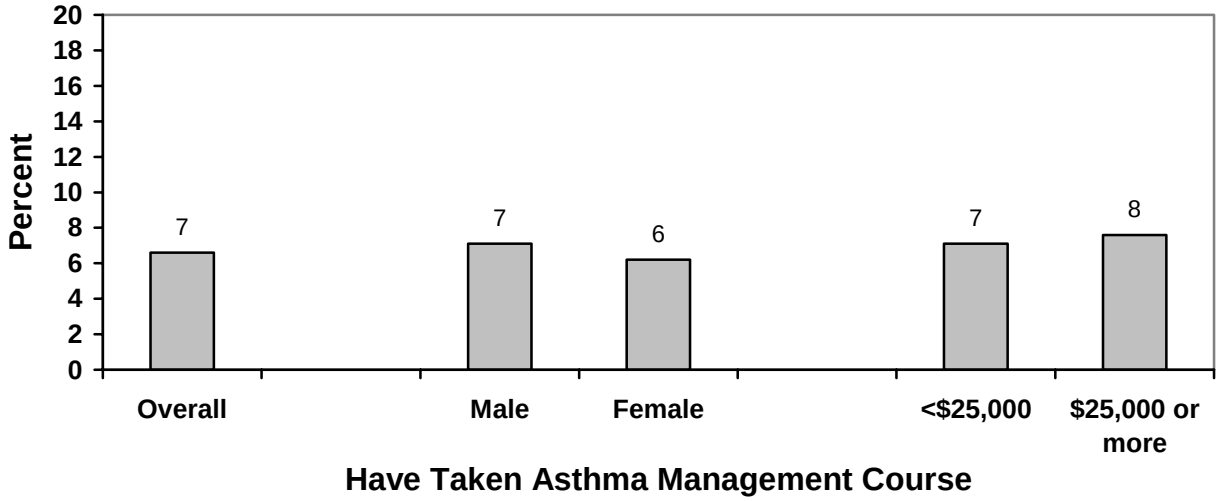
- BRFSS Asthma Callback Survey
    - Only 19% of adult Oregonians with asthma reported ever receiving an asthma action plan from their healthcare provider.
    - Only 7% of adult Oregonians with asthma have taken a course or class on how to manage their asthma.
- Asthma Data Workgroup (ADWG) and Oregon Division of Medical Assistance Programs-Quality and Performance Improvement Workgroup (DMAP-QPIWG)
    - Of Oregonians with persistent asthma in 2005, 79% of those with commercial insurance and 66% of Medicaid recipients received at least one dispensing of a daily inhaled corticosteroid (i.e., controller medication) in the past year.
    - Of Oregonians with persistent asthma in 2005, 18% of those with commercial insurance and 41% of Medicaid recipients received more than six dispensings of an inhaled short-acting $beta_2$-agonist (i.e., rescue medication) in the past year.

Figure 33 Percentage of adults with asthma who report ever receiving an asthma action plan from their healthcare provider, by sex and by income, 2005



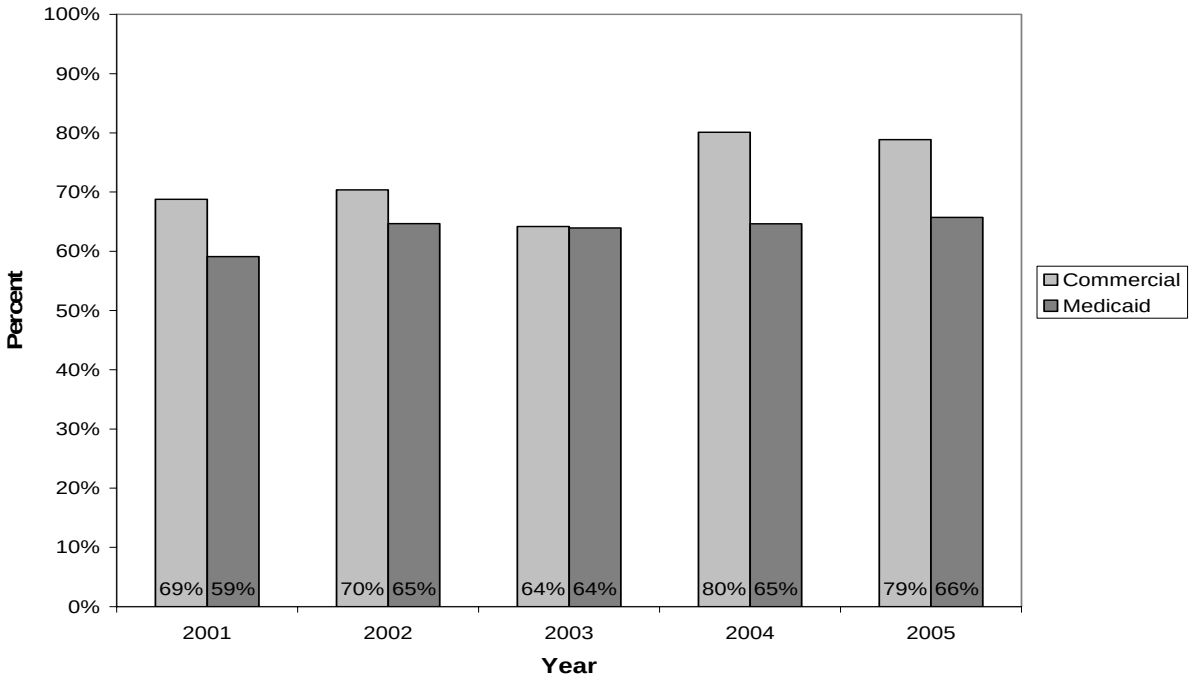
Source: BRFSS Asthma Callback Survey, 2005

Figure 34 Percentage of adults with asthma who have taken a course or class on how to manage their asthma, by sex and by income, 2005



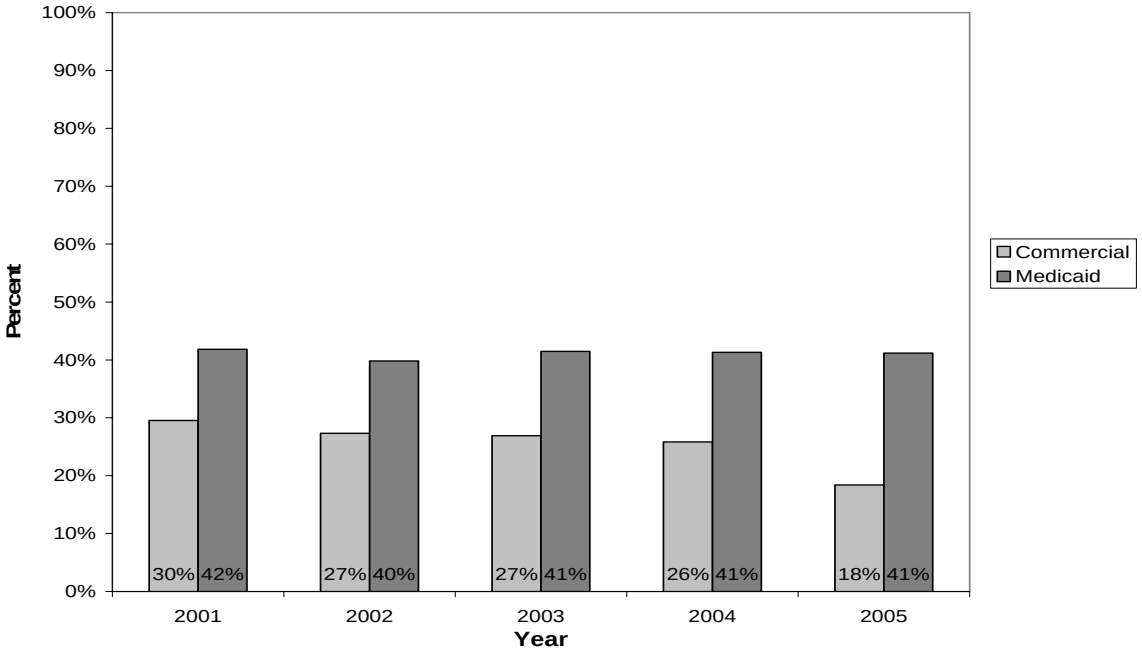
Source: BRFSS Asthma Callback Survey, 2005

Figure 35 Age-adjusted percentage of Oregonians with persistent asthma, by type of insurance, who received at least one prescription for a daily inhaled corticosteroid* in the past year, 2001-2005



Source: ADWG and DMAP-QPIWG, 2001-2005
* From 2001-2005 this measure examined any anti-inflammatory asthma medication. In 2005, the measure changed to a daily inhaled corticosteroid.

Figure 36 Age-adjusted percentage of Oregonians with persistent asthma, by type of insurance, who received more than six dispensings for an inhaled short-acting beta$_2$-agonist in the past year, 2001-2005



Source: ADWG and DMAP-QPIWG, 2001-2005

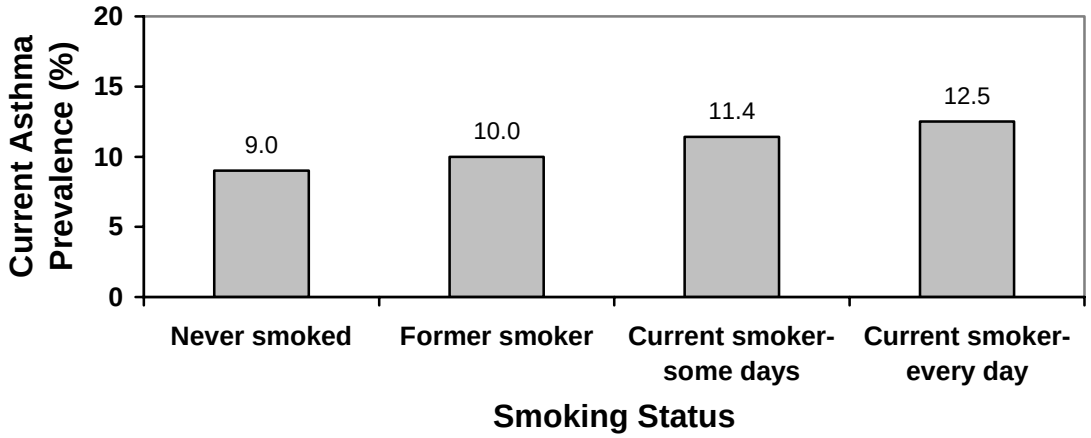
Risk Factors for Asthma

Risk factors for asthma are monitored through the Behavioral Risk Factor Surveillance System (BRFSS). The risk factors analyzed in this report include smoking, secondhand smoke exposure, and obesity as measured by the body mass index (BMI).

Key Findings

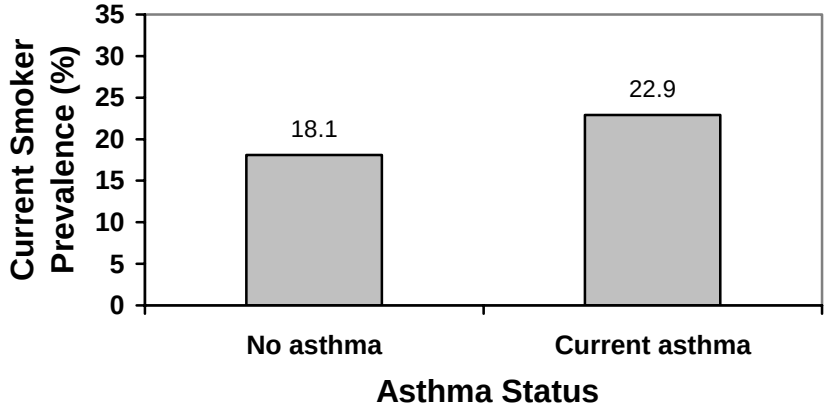
- Asthma prevalence in 2005 is highest among current smokers who smoke every day (12.5%) followed by current smokers who smoke some days (11.4%), former smokers (10.0%) and people who have never smoked (9.0%).
- In 2005, people with asthma were 27% more likely to be current smokers than people without asthma (22.9% vs. 18.1%, respectively).
- Asthma prevalence in 2005 is unrelated to secondhand smoke exposure.
- In 2005, the percentages of people exposed to secondhand smoke in a typical week were similar among people with asthma (33.2%) and people without asthma (32.4%).
- Asthma prevalence in 2005 was similar for those with a BMI of <25 kg/m^2 (9.2%) and those who were overweight (8.1%). However, prevalence was higher for obese people (12.9%) and higher still in extremely obese people (13.7%).
- In 2005, the percentage of obese people was higher for those with asthma than for those without asthma (37% vs. 27%, respectively).

Figure 37 Current asthma prevalence by smoking status, Oregon adults, 2005



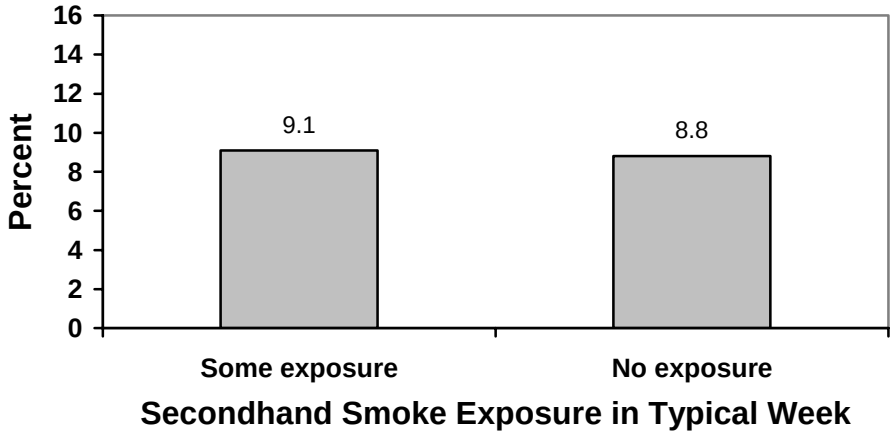
Source: BRFSS, 2005

Figure 38 Percentage of Oregon adults who currently smoke, by current asthma status, 2005



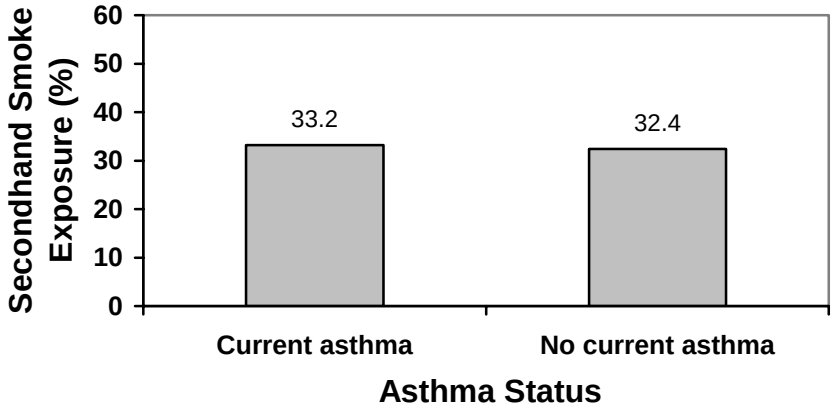
Source: BRFSS, 2005

Figure 39 Current asthma prevalence by secondhand smoke exposure in a typical week (excluding current smokers), Oregon adults, 2005



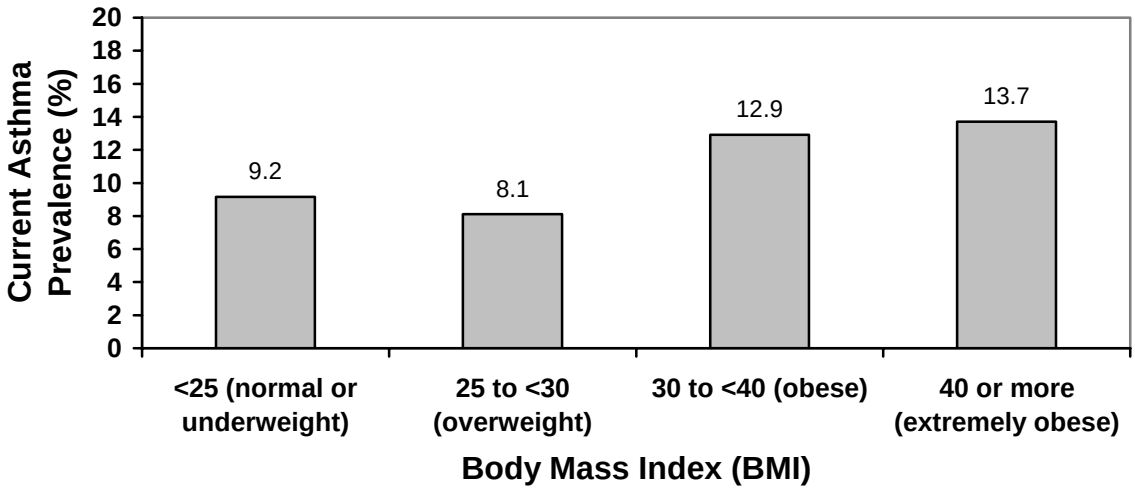
Source: BRFSS, 2005

Figure 40 Percentage of Oregon adults with secondhand smoke exposure in a typical week (excludes current smokers), by current asthma status, 2005



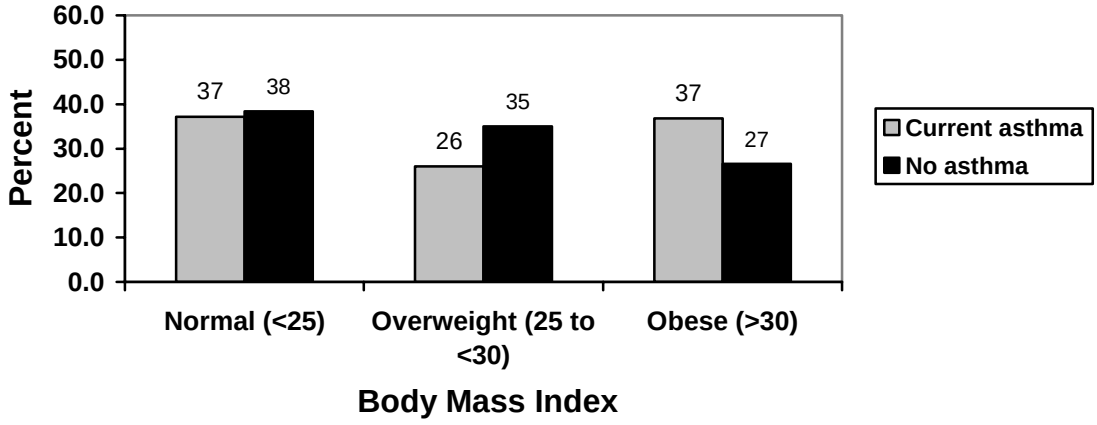
Source: BRFSS, 2005

Figure 41 Current asthma prevalence by body mass index, Oregon adults, 2005



Source: BRFSS, 2005

Figure 42 Distribution of Oregon adults, with and without current asthma, by body mass index, 2005



Source: BRFSS, 2005

Asthma in the Medicaid Population

Although information on Oregonians with Medicaid health insurance from the BRFSS are interspersed throughout this report, we also include this separate section on the Medicaid population. This section includes findings from the Oregon Medicaid Health Risk and Health Status Survey (HRHSS) and from analysis of medical claims data gathered by the Division of Medical Assistance Programs-Quality and Performance Improvement Workgroup (DMAP-QPIWG).

The HRHSS was conducted in 2004 by the Oregon Department of Human Services, Health Services, Office of Medical Assistance Programs to measure the health risk and health status of adult Oregon Health Plan (OHP) clients. This telephone survey was conducted in English and Spanish from August through October 2004, and the survey was designed to assess health risk behaviors, clinical preventive health practices, and healthcare access, mainly related to chronic diseases. The eligible population included adults age 18 or older who were enrolled in the Oregon Health Plan (OHP) for at least 137 days during the period of July 1, 2003-June 30, 2004. Continuous enrollment was not required. The sample was random and stratified by six race/ethnicity categories: White, African American, Hispanic, Native American, Asian, and Other. A total of 11,921 adult enrollees were included in the survey sample and 2,995 completed the survey. As a random sample, these results should be interpreted as estimates of behaviors and practices with inherent variability rather than as precise prevalence percentages.

Our second source of Medicaid-related asthma data comes from the DMAP-QPIWG. Through this workgroup we are able to measure and compare five asthma indicators across all Medicaid clients in Oregon, which makes Oregon the only state to have full availability to asthma data for the Medicaid population of the entire state. The indicators are derived from medical and pharmacy claims for Oregonians served by Medicaid who are between the ages of 4-55 years and who have at least six months of continuous enrollment.

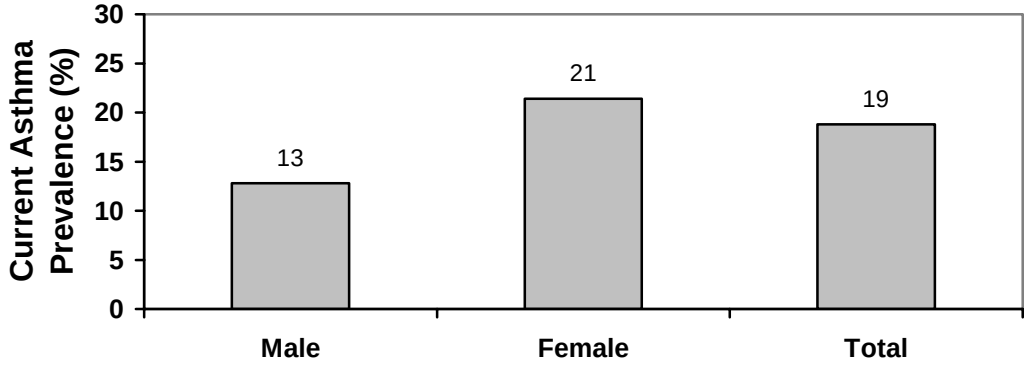
Key Findings

- Prevalence
    - In 2004, current asthma prevalence was 18.8% among adult Medicaid recipients as assessed by the HRHSS. This is similar to the 2005 BRFSS finding for people served by Medicaid and is more than twice the prevalence seen in the non-Medicaid population as assessed by the BRFSS survey.
    - Current asthma prevalence in 2004 increases with age through age 45-54 and then decreases.
- Emergency department (ED) and urgent care visits
    - In 2004, self-reports indicate that 22% of the Medicaid population had been to the ED or an urgent care center for asthma in the past 12 months.
    - Medical claims from 2001-2005 indicate that 13-16% of the Medicaid population had been to the ED for asthma in the past 12 months.
    - Among Medicaid recipients from 2001-2005 who visited an ED for asthma in the past 12 months, 34-44% had a follow-up outpatient visit for asthma within 30 days of the ED visit.
- Asthma control
    - In 2004, 78% of adults with asthma served by Medicaid had asthma symptoms at least once a week in the past four weeks and 67% reported at least some degree of limitation of their usual activities due to asthma.

    - Of adults with asthma served by Medicaid in 2004, in the past three months 8% missed 1-3 days and 12% missed four or more days of work, school, or other daily activities.
    - Among adults served by Medicaid in 2004, compared to people without asthma, people with asthma were less likely to rate their health as excellent or very good (15% vs. 27%, respectively) and more likely to rate their health as fair or poor (65% vs. 43%, respectively).
- Asthma management
    - According to self-reports from 2004, 52% of the adult Medicaid population did not visit a healthcare professional in the past 12 months for routine treatment of asthma.
    - Medical claims from 2001-2005 indicate that 59-66% of the Medicaid population with persistent asthma has received at least one inhaled corticosteroid dispensing in the past 12 months.
    - From 2001-2005, 40-42% of the Medicaid population with persistent asthma received more than six short-acting $beta_2$-agonist rescue medication dispensings in the past 12 months, indicating that their asthma is not well controlled.
- Risk factors
    - Of adults served by Medicaid, current asthma prevalence in 2004 was higher for former smokers (22%) and current smokers (20%) than for people who have never smoked (16%).
    - In 2004, among the adult Medicaid population, people with asthma are more likely to be current smokers (38%) than were people without asthma (35%).
    - Among non-smoking adults served by Medicaid, current asthma prevalence in 2004 was higher for people with secondhand smoke exposure (21%) than for people with no exposure (17%).
    - In 2004, among the adult, non-smoking Medicaid population, people with asthma are more likely to have secondhand smoke exposure (36%) than were people without asthma (31%).

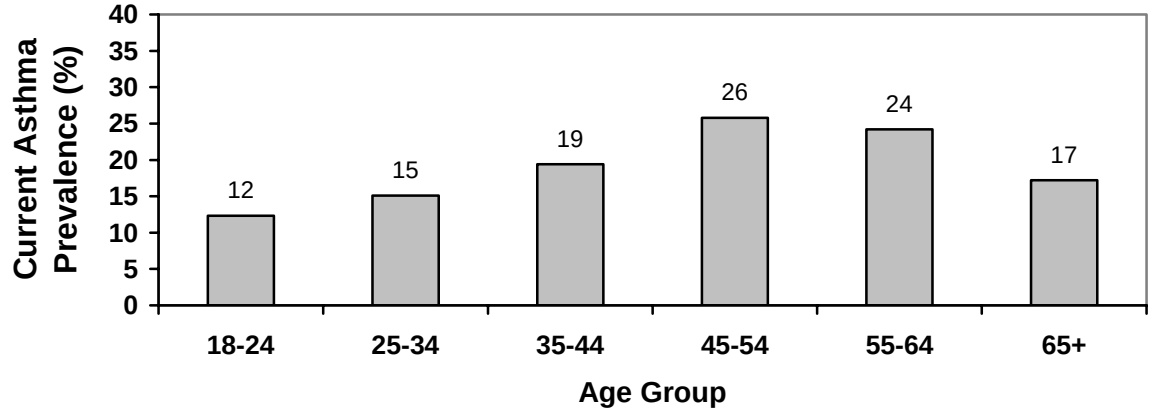
Prevalence

Figure 43 Current asthma prevalence by sex among Oregon adult Medicaid recipients, 2004



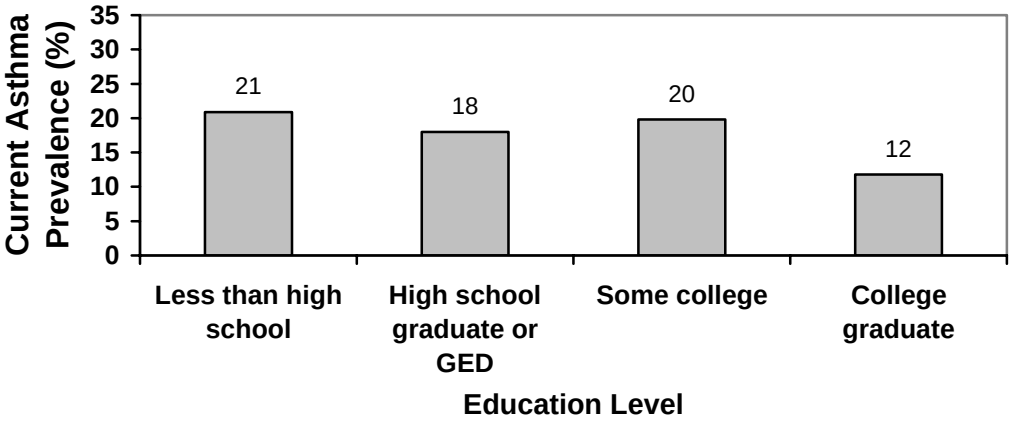
Source: HRHSS, 2004

Figure 44 Current asthma prevalence by age group among Oregon adult Medicaid recipients, 2004



Source: HRHSS, 2004

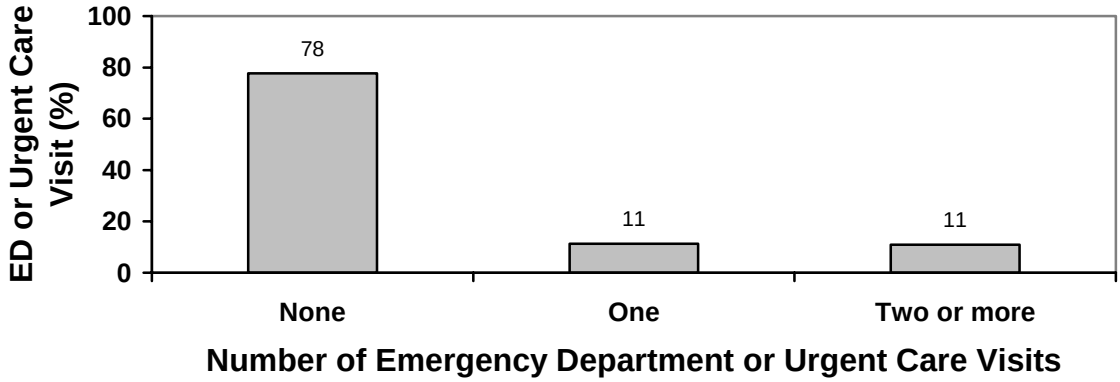
Figure 45 Current asthma prevalence by education level among Oregon adult Medicaid recipients, 2004



Source: HRHSS, 2004

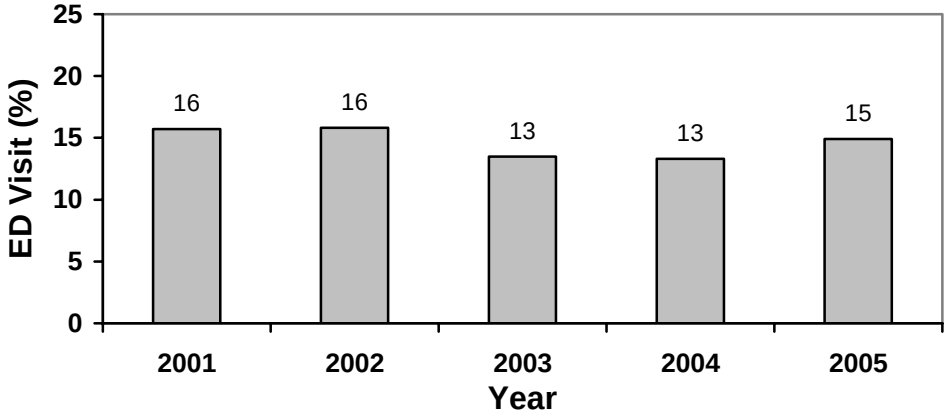
Emergency Department or Urgent Care Visits

Figure 46 Number of emergency department or urgent care visits in the past 12 months due to asthma among Oregon adult Medicaid recipients with asthma, 2004



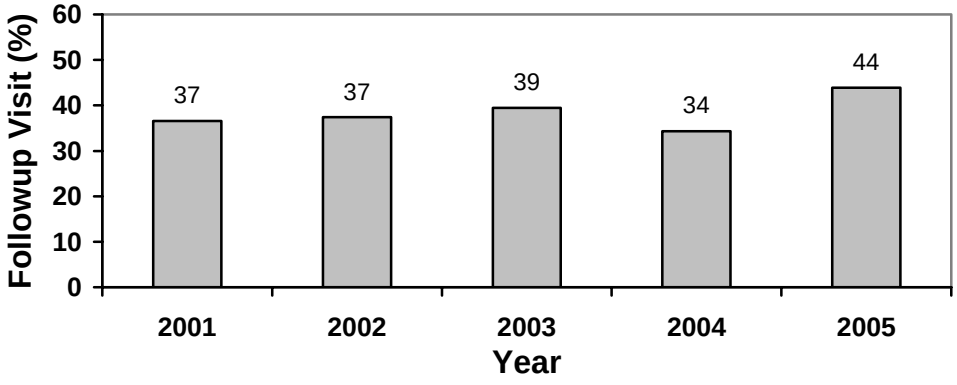
Source: HRHSS, 2004

Figure 47 Percentage of Oregon Medicaid recipients age 4-55 years who had an emergency department visit for asthma in the past 12 months, by year, 2001-2005



Source: ADWG and DMAP-QPIWG, 2001-2005

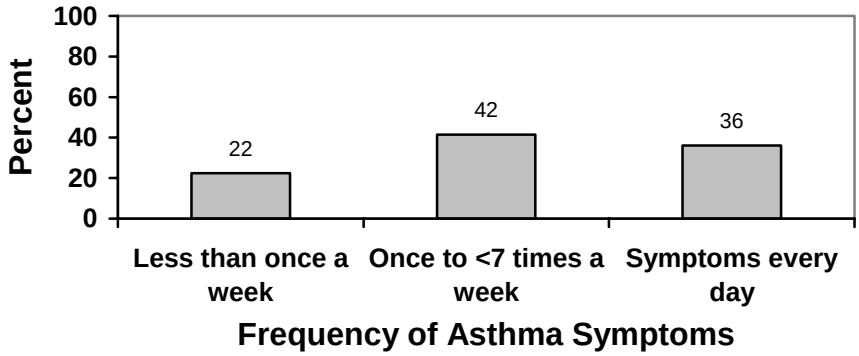
Figure 48 Percentage of Oregon Medicaid recipients age 4-55 years who had a follow-up outpatient visit for asthma within 30 days of an emergency department visit for asthma, by year, 2001-2005



Source: ADWG and DMAP-QPIWG, 2001-2005

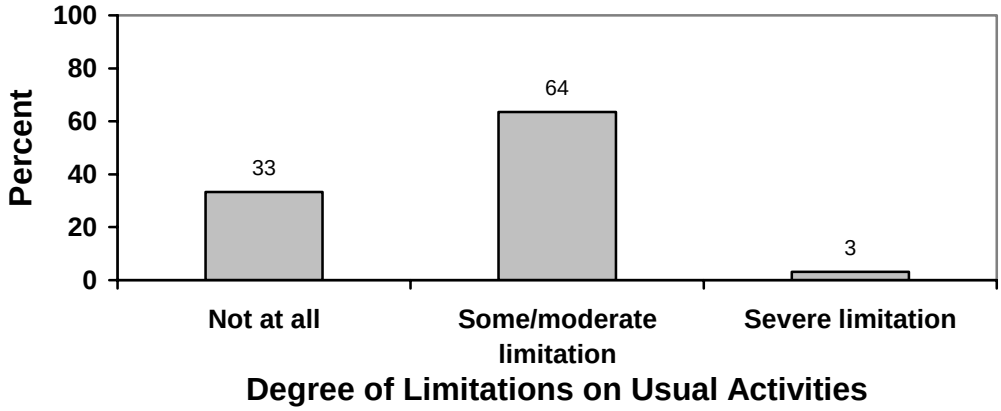
Asthma Control

Figure 49 Frequency of asthma symptoms in past four weeks among Oregon adult Medicaid recipients with asthma, 2004



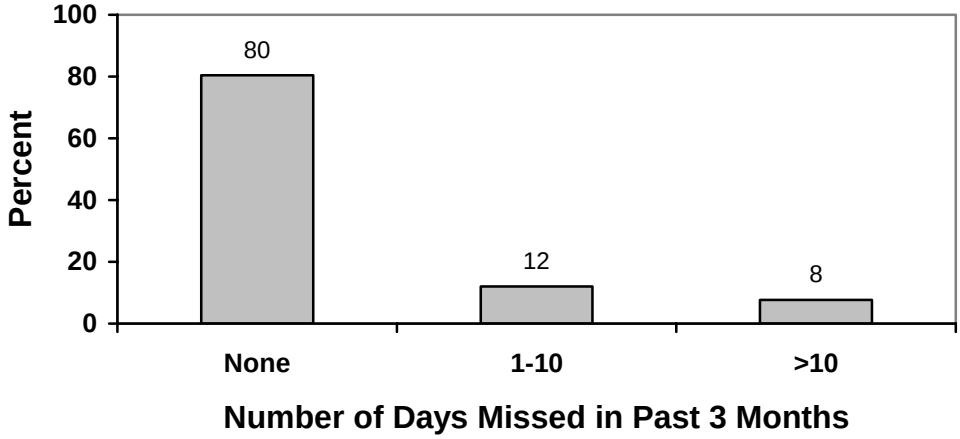
Source: HRHSS, 2004

Figure 50 Degree of self-reported limitations of usual activities due to asthma among Oregon adult Medicaid recipients with asthma, 2004



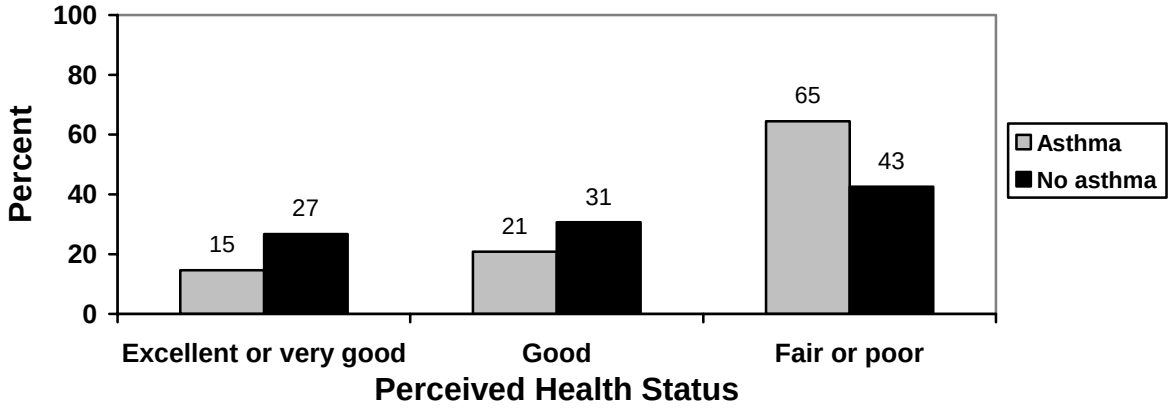
Source: HRHSS, 2004

Figure 51 Number of days of work, school, or other daily activities missed in the last three months because of asthma among Oregon adults with asthma who are served by Medicaid, 2004



Source: HRHSS, 2004

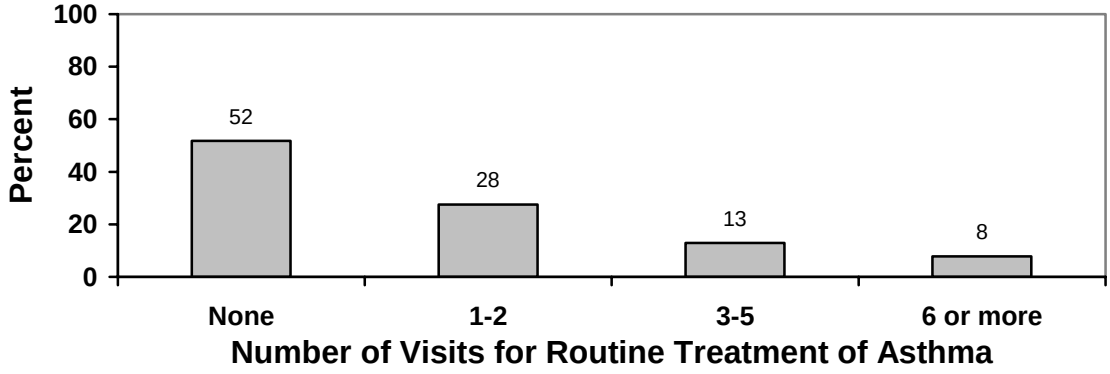
Figure 52 Perceived health status among Oregon adult Medicaid recipients, by asthma status, 2004



Source: HRHSS, 2004

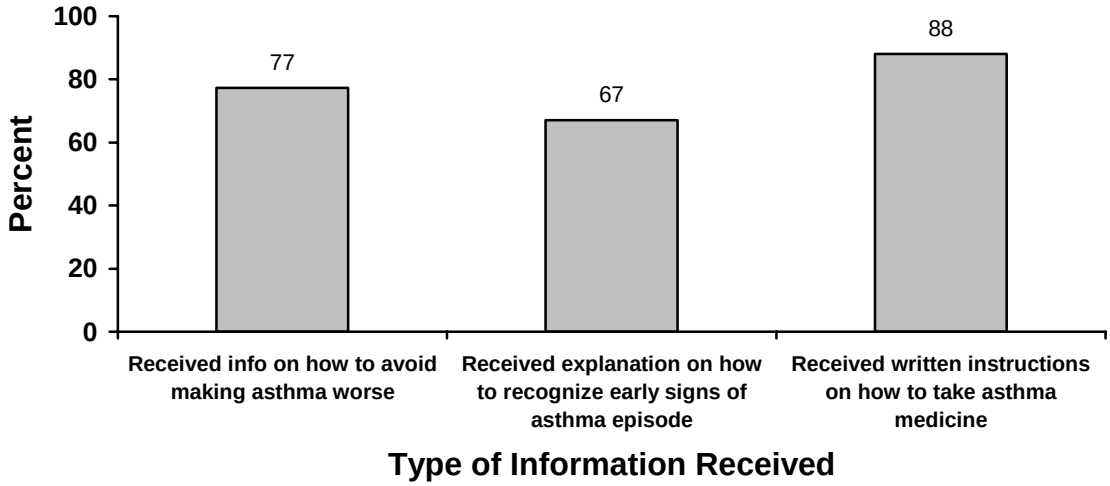
Asthma Management

Figure 53 Number of visits to a healthcare professional in the past 12 months for routine treatment of asthma among Oregon adult Medicaid recipients with asthma, 2004



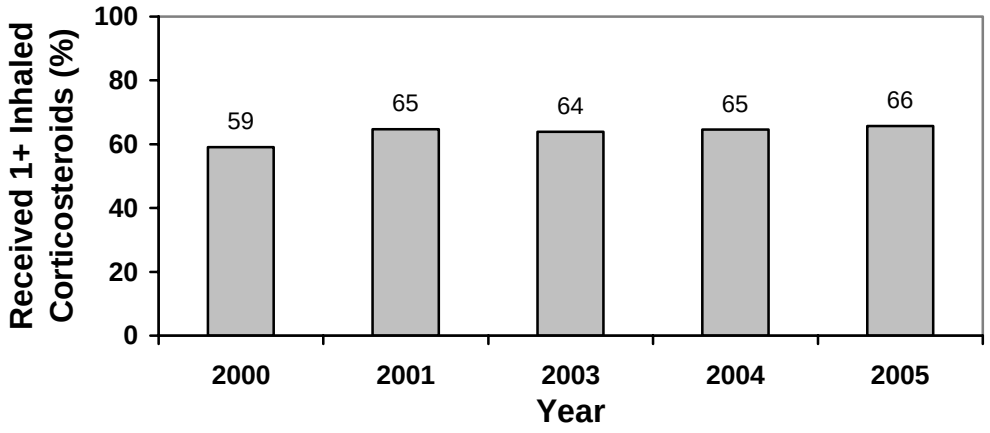
Source: HRHSS, 2004

Figure 54 Percentage of Oregon adult Medicaid recipients with asthma who report receiving asthma information from their healthcare provider, 2004



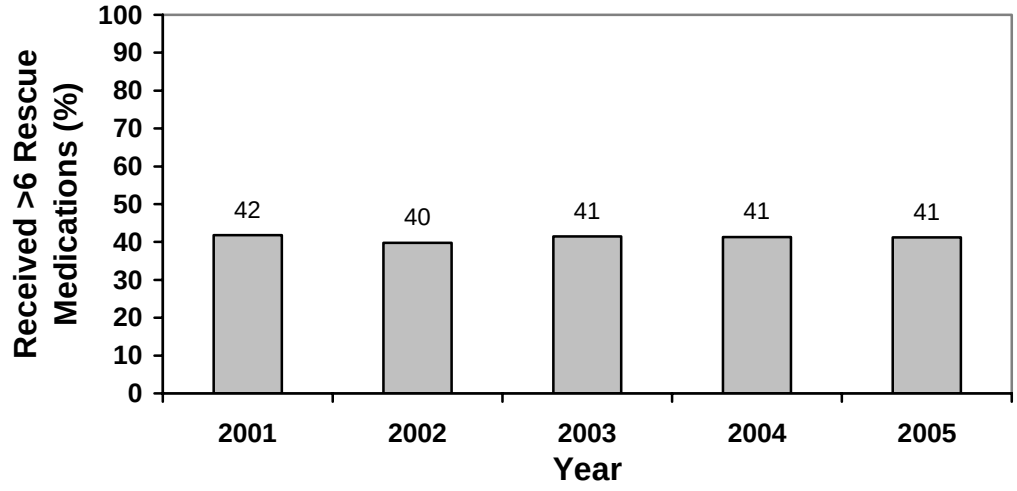
Source: HRHSS, 2004

Figure 55 Percentage of Medicaid recipients age 4-55 years with persistent asthma who received at least one inhaled corticosteroid* dispensing in the past 12 months, by year, 2001-2005



Source: ADWG and DMAP-QPIWG, 2001-2005
* From 2001-2005 this measure examined any anti-inflammatory asthma medication. In 2005, the measure changed to a daily inhaled corticosteroid.

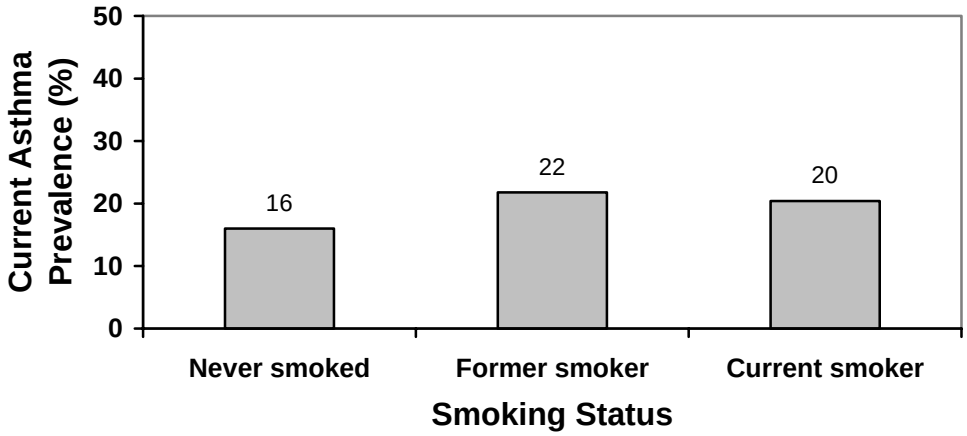
Figure 56 Percentage of Medicaid recipients age 4-55 years with asthma who received more than six rescue medication dispensings in the past 12 months, by year, 2001-2005



Source: ADWG and DMAP-QPIWG, 2001-2005

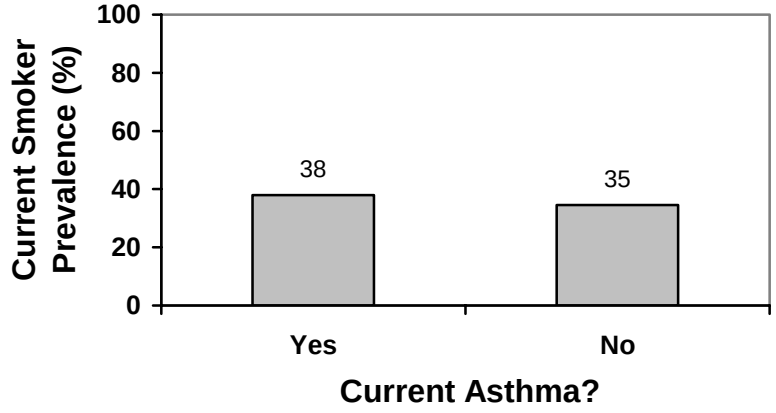
Risk Factors

Figure 57 Current asthma prevalence by smoking status among Oregon adult Medicaid recipients, 2004



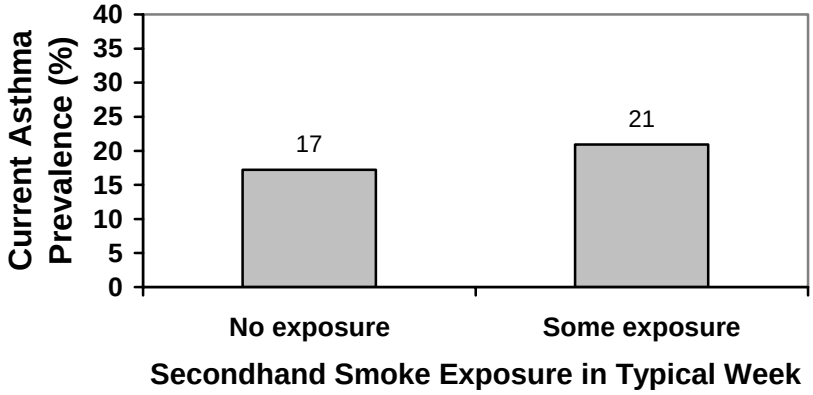
Source: HRHSS, 2004

Figure 58 Percentage of Oregon adult Medicaid recipients who currently smoke, by current asthma status, 2004



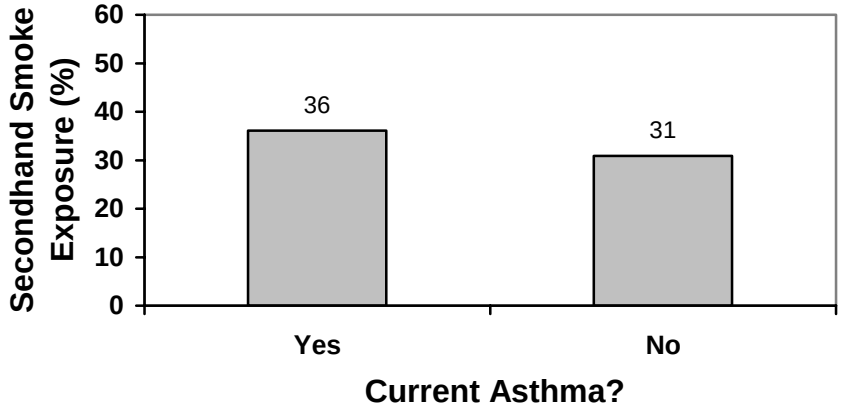
Source: HRHSS, 2004

Figure 59 Current asthma prevalence among Oregon adult Medicaid recipients, by secondhand smoke exposure in a typical week (excluding current smokers), 2004



Source: HRHSS, 2004

Figure 60 Percentage of Oregon adults with secondhand smoke exposure in a typical week (excludes current smokers) among Oregon adult Medicaid recipients, by current asthma status, 2004



Source: HRHSS, 2004

Appendix A: Data Source Listings, Descriptions, and Limitations

The data sources used in this report and described in the grant narrative are listed below in Table 4. Each data source is described, and the limitations for each source are also provided in the table.

Table 5 Listing, description, and limitations of data sources.

Data Source	Description	Limitations
Asthma Data Workgroup (ADWG)	The ADWG is a collaboration between the Oregon Asthma Program (OAP) and Oregon's commercial and Medicaid health plans and health systems. Together we have developed methods to measure and report asthma data consistently across plans. Currently, health plans report data in summary form to the OAP each year. The OAP analyzes the data and reports the aggregate results back to the ADWG; results are also reported via presentations and publications. The data are derived from the medical and pharmacy claims records of insured Oregonians who are 4-55 years old and have at least six months of continuous enrollment in a participating health plan. In 2005, more than 550,000 insured Oregonians met these criteria.	The data are limited by age (4-55 years only), by the number of health plans that participate (e.g., 14 health plans in 2005), and by insurance status (insured people only with 6 months of continuous coverage). As such, the data are not necessarily representative of all Oregonians or of all insured Oregonians.
Behavioral Risk Factor Surveillance System (BRFSS) - Standard version - Race/ethnicity over-sample - County over-sample	The BRFSS is a random-digit dialed telephone survey that is conducted year-round among Oregon adults aged 18 years or older. Asthma prevalence questions are included every year, and Oregon-specific supplemental asthma questions are included most years. Child prevalence is obtained by adult proxy to the 6-question random child selection module and the 2-question child prevalence module, which have been asked every year since 2002. Every few years, Oregon conducts additional BRFSS surveys among under-represented races and ethnicities. The results of these surveys are combined with statewide BRFSS data to provide more stable estimates for asthma prevalence, other chronic diseases, and related risk factors among these groups of Oregonians. The most recent race/ethnicity over-samples were conducted in 2004-2005. In addition, BRFSS surveys from 2002-2005 were aggregated to produce more reliable county-level asthma prevalence estimates.	BRFSS estimates pertain only to the adult population age 18 years or older living in households. Respondents are identified through telephone-based methods; however, according to the 2000 Census, 1.6% of Oregon households do not have telephones. No direct method of compensating for non-telephone coverage is employed by the BRFSS; however, post-stratification weights are used, and these are expected to partially correct for any bias caused by non-telephone coverage. These weights adjust for differences in probability of selection and non-response, as well as non-telephone coverage, and must be used for deriving representative population-based estimates of prevalences. Results obtained through BRFSS surveys are also limited in that they represent self-reported responses. Some, but not all questions have been validated.
BRFSS asthma callback	Oregon was one of three states to implement the BRFSS asthma callback in 2005. The callback is a follow-up survey administered to people who indicated on the BRFSS that they have asthma. Through the callback, we collect detailed information on topics such as healthcare utilization, knowledge of asthma, asthma management, asthma medications, environmental factors, costs of asthma care, work-related asthma, co-morbid conditions, and complementary and alternative medicines.	The BRFSS asthma callback has many of the same limitations described above for the telephone-based BRFSS. In addition, not all people with asthma from the standard BRFSS are reached; hence, the attrition may lead to differences between the original BRFSS respondents and those respondents who also complete the asthma callback.

Data Source	Description	Limitations
Death certificates and CDC Wonder	Asthma mortality is monitored through Oregon's Death Certificate Statistical File, which contains information about all deaths occurring in Oregon and deaths occurring out-of-state among Oregon residents. Asthma must be listed as the underlying (principal) cause of death in order to be considered an asthma death. When appropriate, mortality rates presented in this report have been age-adjusted to the U.S. 2000 standard population. For comparability, state and national age-adjusted rates may be obtained from the Centers for Disease Control and Prevention (CDC) *Wonder* data system at http://wonder.cdc.gov.	One limitation to this dataset is the relatively small number of asthma deaths that occur each year (about 50-70 deaths annually). Given these small numbers, the mortality rate for any given year may not provide a stable estimate. A second limitation is that the accuracy of these data naturally depends on the accuracy with which the provider completes the death certificate.
Division of Medical Assistance Programs-Quality and Performance Improvement Workgroup (DMAP-QPIWG)	Our unique relationship with the DMAP-QPIWG enables us to measure five asthma indicators for all Medicaid clients in the state which makes Oregon the only state to have access to asthma data for the entire state Medicaid population. The indicators are the same as those measured by the ADWG and are calculated using medical and pharmacy claims for Oregonians served by Medicaid who are 4-55 years old and have at least six months of continuous enrollment.	The data are limited to Medicaid members only and are further limited by age (4-55 years only) and by insurance status (insured people only with at least 6 months of continuous coverage).
Hospital Discharge Index	The Hospital Discharge Index provides information on hospital discharges from all acute care hospitals in Oregon except the two Veterans Administration hospitals. The dataset includes admit and discharge dates, diagnosis and procedural codes, financial charges, primary payer, and limited patient demographic information (e.g., gender). Unique identifiers are not available. In this dataset, an asthma hospitalization is defined as having a primary diagnosis with an International Classification Disease 9th Revision Clinical Modification (ICD-9-CM) code of 493. When possible, hospitalization rates presented for this dataset have been age-adjusted to the U.S. 2000 standard population.	The Hospital Discharge Index does not include identifying information that would allow us to ascertain when a single person has multiple hospitalizations; therefore, the calculated rate is the number of hospitalizations per capita rather than number of different people hospitalized per capita. In addition, the dataset does not include information on race or ethnicity.
Oregon Medicaid Health Risk and Health Status Survey (HRHSS)	The HRHSS was conducted in 2004 by the Oregon Department of Human Services Division of Medical Assistance Programs to measure the health risk and health status of adult Oregon Health Plan (OHP) clients. This telephone survey was conducted in English and Spanish from August-October 2004, and the survey was designed to assess health risk behaviors, clinical preventive health practices, and healthcare access, mainly related to chronic diseases. The eligible population included adults age 18 or older who were enrolled in the Oregon Health Plan (OHP) for at least 137 days during the period of July 1, 2003-June 30, 2004. Continuous enrollment was not required. The sample was random and stratified by six race/ethnicity categories (White, African American, Hispanic, Native American, Asian, and Other). A total of 11,921 adult enrollees were eligible to be surveyed and 2,995 completed the survey.	As a random sample, these results should be interpreted as estimates of behaviors and practices with inherent variability rather than as precise prevalence percentages. In addition, the HRHSS has many of the same limitations described above for the telephone-based BRFSS.

Data Source	Description	Limitations
Oregon Healthy Teens (OHT) Survey	Since 2000, the Youth Risk Behavior Survey (developed by the CDC) and the Oregon Public School Drug Use Survey have been combined for Oregon into a single annual survey called Oregon Healthy Teens (OHT). The sample size varies between 1,600-32,000 per year, and the final data are weighted to more accurately represent the Oregon high school population. In addition to assessing other topics such as tobacco and alcohol use, HIV knowledge and attitudes, eating behaviors, nutrition, and exercise, the questionnaire also provides an estimate of lifetime and current asthma prevalence among Oregon students in 8th or 11th grade. The OHT may also assess frequency of asthma symptoms, asthma episodes, or missing school due to asthma.	One limitation is that participation by school systems in the OHT is voluntary. However, participation rates have been high thus far and recent sample sizes have been ~25,000 per year. Another limitation is that the OHT is not currently available in non-English versions except for a Spanish hard copy that can be used as a reference when filling out the English version of the survey. A third limitation is that 3% of surveys were eliminated due to combinations of "dubious" answers and another 5% were eliminated because the student did not fill out the grade or gender information.