

Asthma in Alaska

2006 Report





Asthma in Alaska: 2006 Report

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EXECUTIVE SUMMARY

During 2004, approximately 12% of Alaskan adults (55,400 people) had been told they have had asthma at some point in their lives including 8% (37,000) with current asthma.

- Current asthma was equally common among all age groups and among persons of all educational levels.
- Obese adults were substantially more likely to report current asthma than other adults (10% vs. 6%).
- During 2004, 18,000 adult Alaskans with asthma had one or more routine check-ups for asthma (50,000 total routine check-ups for asthma), 9,000 adults with asthma had an urgent care visit for asthma (27,000 total visits), and 5,500 adults with asthma received emergency room care for asthma (10,000 total visits).
- Over 50% of adults with asthma experienced an asthma attack during the previous year and 25% had activity limitations as a result of their asthma.
- Over 20% of Alaskan adults with current asthma have symptoms every day and another 33% have symptoms at least weekly.
- During 2004, approximately 34% of children with asthma lived with an adult who currently smokes and 16% lived in homes where smoking was allowed.
- Among persons <20 years of age enrolled in Medicaid, asthma prevalence doubled during 1999-2002 while hospitalizations among children with asthma decreased.
- Among persons <20 years of age enrolled in Medicaid who had asthma, Alaska Natives living in Anchorage experienced the greatest decrease in hospitalization and the greatest increase in inhaled corticosteroid use. Rural Alaska Natives continued to report the greatest risk of hospitalization.
- Compared to non-Natives living in or outside of Anchorage, adult Alaska Native non-Anchorage residents with asthma were more than twice as likely to visit the emergency room during the previous 12 months.
- Asthma mortality in the US as a whole has decreased significantly since 1994 while asthma mortality in Alaska has increased steadily during 1979-2002.
- Between 2001 and 2004, known asthma hospitalization charges totaled almost \$17 million, approximately \$9200 per hospitalization.

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INTRODUCTION

Asthma affects an estimated 16 million adults in the United States and during 1994 cost the US economy approximately \$11 billion. Economic losses were divided approximately equally between indirect costs (workdays lost, time lost from school, and costs attributed to deaths) and direct medical costs (primarily medications). Costs to the Alaska economy during 1998 were estimated at \$24 million with costs for Anchorage residents contributing \$12 million.

The etiology of asthma remains a subject of debate and thus primary prevention is not yet an obtainable goal. Much of the disability and costs associated with asthma, however, can be prevented through a variety of measures. These include access to health care and identification of persons with asthma throughout the state; patient and provider education regarding optimal disease management; identification and avoidance or reduction of asthma triggers at both an individual and societal level; pharmacological management; and ongoing disease monitoring.

This document is the first compilation of asthma statistics for Alaska. It was completed by staff from the Alaska Division of Public Health, with support from the American Lung Association of Alaska and the State Systems Development Initiative (Health Resources and Services Administration). The goals of this report are the following:

1. **To communicate to the Alaskan public and medical community the most recent data available on asthma in the state.**
2. **To provide to program personnel the information necessary to manage their programs.**
3. **To provide baseline data for monitoring the effectiveness of planned interventions.**
4. **To provide support for the creation and funding of a State Asthma Control Program.**

We encourage readers to freely use the contents of this report. Additional information on asthma in Alaska may be obtained from the following sources:

1. **The Alaska Maternal and Child Health Epidemiology Website: <http://www.epi.hss.state.ak.us/mche/pi/default.stm>**
2. **The Alaska Section of Chronic Disease Prevention and Health Promotion Website: <http://www.hss.state.ak.us/dph/chronic/default.htm>**
3. **The American Lung Association of Alaska website: <http://www.aklung.org/>**
4. **The Asthma and Allergy Foundation of America – Alaska chapter website: <http://www.aafaalaska.com/>**
5. **The US Centers for Disease Control and Prevention asthma data website: <http://www.cdc.gov/asthma/asthmadata.htm>**
6. **Bradford D. Gessner, MD, Director MCH-Epidemiology Unit, 269-8073**
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HEALTH CARE ISSUES IN ALASKA

Alaska is an extraordinarily large state encompassing 586,412 square miles. Alaska's vastness, its formidable terrain, and its extreme climate challenge the delivery of health care to its citizens. Only five of Alaska's urban centers are connected by road and for those areas travel requires considerable time, due to the great distances between towns and adverse weather conditions. Many towns and villages in Alaska are accessible only by water or air. Travel by air may be the only feasible mode of transportation due to the distances involved and lack of roads. Intra-state air travel in Alaska often involves greater distances than inter-state travel in the lower 48 states.

Health care delivery in Alaska occurs within a complex web of service systems, including the State, the Alaska Native Tribal Health Consortium, the military, the Municipality of Anchorage, Alaska Native regional health corporations, other non-profits, and private for-profit providers offering care to various distinct sub-populations. Funding for services includes self-payment and private insurance, federal programs such as Medicaid and Indian Health Service benefits and a variety of state programs that pay for specific types of care.

Sub-specialty care is available primarily in Anchorage and to a lesser extent Fairbanks. Most small towns and villages have no physicians. Residents in approximately 170 villages receive health care from Community Health Aides, who are selected by their villages and who then undertake 16 weeks of training.

Alaska is not divided into counties, and while some boroughs have been formed, most have not elected to assume health powers. Much of the state remains "unorganized" with the state government fulfilling responsibilities otherwise normally handled by local county and municipal governments. Governmental health and social service functions continue to be primarily the responsibility of the state and federal governments – both of which increasingly implement services through various granting and contracting mechanisms.

CURRENT ASTHMA SURVEILLANCE IN ALASKA

Currently Alaska has no State Asthma Control Program to address this chronic disease. In the absence of a State Program, the American Lung Association, Alaska Chapter has taken the lead in creating the Alaska Asthma Coalition. The Asthma Coalition consists of physicians (including asthma and allergy sub-specialists), educators, public relations experts, epidemiologists, and members of the public. Institutionally, the primary organizations involved in the coalition include the American Lung Association of Alaska, the Allergy and Asthma Foundation of America – Alaska Chapter, and the Alaska Division of Public Health. The Coalition has hosted three Asthma Summits to date and is in the process of finalizing a State Asthma Control Plan.

Asthma surveillance has been the responsibility of the Alaska Division of Public Health, Section of Women's, Children's and Family Health, with work performed on an ad hoc basis. Evaluated databases include Medicaid, Hospital Discharge, and the Behavioral Risk Factor Surveillance System (BRFSS). Additionally, the Alaska Division of Public Health and the Anchorage School District collaborated to introduce asthma questions into school health screening forms, although these data have not yet been analyzed.

These sources have several strong advantages. All three are state-based (although the Medicaid database is limited to the population of persons enrolled in Medicaid). Data are updated annually. They provide information on children and adults. Lastly, they require no additional resources other than staff to manipulate, analyze, and report on the data. These sources also have several limitations. None of them include billing or resource utilization data for outpatient asthma care among non-Medicaid beneficiaries. None of the data sources report asthma outcomes based on medical chart review, but rely instead on self-reported diagnoses (BRFSS) or billing codes (Medicaid and Hospital Discharge). Lastly, it is not possible to use these databases to determine whether changes in asthma prevalence occur because of true changes in the occurrence of asthma or asthma exacerbations or changes in physician diagnosis, treatment, or billing patterns.

METHODS

National comparisons

When available national comparisons were made to BRFSS data from the US as a whole (obtainable at <http://www.cdc.gov/asthma/brfss/02/brfssdata.htm>).

Age adjustment

Where appropriate, age-adjusted rates are presented for results of BRFSS analysis. Many health conditions, including asthma, differ in frequency by age groups. Thus differences in overall asthma prevalence between Alaska and the United States or other areas may reflect true differences or differences in the age distribution of the population evaluated. Age adjustment ensures that differences between populations are not due to differences in age distribution (although many other potentially confounding factors may continue to influence comparisons).

Small numbers

Alaska has a relatively small population and thus the absolute number of outcomes is low when compared to other states. These small numbers of events lead to outcome estimates that tend to be statistically unstable, in that the value for a particular outcome may be due in large measure to chance. This statistical instability is reflected in wide confidence intervals. Because of this issue, we have not attempted to provide data for any individual municipality outside of Anchorage.

Behavioral Risk Factor Surveillance System (BRFSS)

The following description is from <http://www.cdc.gov/asthma/brfss/default.htm>. “BRFSS is a state-based, random-digit-dialed telephone survey of the non-institutionalized civilian population 18 years of age and older. It is designed to monitor the prevalence of the major behavioral risks among adults associated with premature morbidity and mortality. Information from the survey is used to improve the health of the American people.”

By 1995, all states, the District of Columbia, and three territories were participating in the BRFSS. CDC develops standard core questionnaires for states to use to provide data that can be compared across states. States can choose to add additional questions of their own and can also choose among a number of optional modules that cover specific topics in greater detail. More information about BRFSS can be found at: <http://www.cdc.gov/brfss/>

Before 1999, several states included questions about asthma on their BRFSS questionnaire, but the wording of the questions varied among those states. In 1999, an optional two-question asthma module was added to the BRFSS, representing the first effort to systematically collect state-based asthma prevalence data. In 2000, the two questions were included in the core of the BRFSS questionnaire and were asked in all participating states and territories. The two asthma questions will be included in the BRFSS in future years as well. In addition, beginning with 2001, nine questions on adult asthma history and two questions on child prevalence are available as optional modules.

For each year of BRFSS asthma data, two asthma prevalence measures were constructed. Lifetime asthma is defined as an affirmative response to the question ‘Have you ever been told by a doctor {nurse or other health professional} that you have asthma?’. Current asthma is defined as an affirmative response to that question followed by an affirmative response to the subsequent question ‘Do you still have asthma?’”

Year of report

For BRFSS data, the most recent available year was 2004 and these data are used for most presentations of single year data. The only exception is for outcomes where comparison to values for the US as a whole are available. The US Centers for Disease Control and Prevention has finalized and posted BRFSS results through 2003. However, for Alaska, an unusual increase in asthma prevalence occurred during 2003, which might invalidate comparisons with summary US data. Consequently, for outcomes compared to US standards, results for 2002 are presented for both Alaska and the US. The most recent year evaluated for Medicaid was 2002. Asthma hospital discharge data were available for 2001 and 2002. Asthma mortality data for the US and Alaska were available through 2002.

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DATA SOURCES

Behavioral risk factor surveillance system (BRFSS)

BRFSS is a population-based, random-digit dialed telephone survey of civilian, non-institutionalized adults, aged 18 years and older. The survey is coordinated by the US Centers for Disease Control and Prevention and is conducted annually by all 50 US states, three territories, and the District of Columbia. A core set of questions, which has included adult asthma prevalence, is asked annually. Additionally, Alaska uses separate modules on adult and pediatric asthma.

Medicaid

Medicaid files were evaluated for persons <20 years of age to determine asthma prevalence and medication use among lower income groups. For this analysis, asthma was defined as an approved claim for asthma-related medication use and care during the same calendar year. This definition was employed so that persons presenting for evaluation of possible asthma who never received treatment were not included in prevalence estimates. Individual level records were not available before 1999. Diagnoses were coded using ICD-9 (493.0x-493.9x). The Medicaid database is used for administrative – primarily billing – purposes, which results in notable limitations. For example, medication is only recorded if a prescription is actually filled, which reflects a combination of provider prescribing practices and patient prescription filling practices.

Compared to BRFSS, the Medicaid analysis was performed on a different age group (<20 years for Medicaid vs. <18 years for BRFSS), used a different definition of asthma, and was conducted during different years. Consequently, results of Medicaid and BRFSS analysis cannot be directly compared.

Vital statistics

The cause of death analyzed for the current study was the underlying cause of death. The underlying cause of death is the specific disease, condition, or injury that initiated the chain of events leading to death and may not be synonymous with the immediate cause of death.

Asthma mortality was determined using data accessed from the US National Center for Health Statistics based on individual state reports (<http://wonder.cdc.gov/mortSQL.html>). Data from this source report underlying cause of death based on specific International Classification of Diseases codes. From 1979-98, ICD-9 codes were used (493-493.9) and from 1999-2002, ICD-10 codes (J45-J46). Changing from ICD-9 to ICD-10 resulted in an increase in disease categories from 5000 to 8000, addition of new chapters, rearrangement of old chapters, regrouping of cause of death categories, and changes in titles of causes of death. Consequently, it is difficult to make direct comparisons of rates using the two systems. The National Center for Health Statistics reports a comparability ratio of 0.89 for the coding of asthma mortality under ICD-10 compared to ICD-9, implying that ICD-10 coding will classify 11% fewer deaths as asthma than ICD-9.

Inpatient Hospital Discharge Data

Alaska is hampered by lack of mandatory hospital discharge data reporting. A voluntary system exists in the state, and is maintained by the Department of Health and Social Services, Division of Health Planning and Systems Development. Through 2002, this database did not yet receive reporting from all hospitals; in particular, among hospitals serving primarily Alaska Natives, only the largest was included through 2002. Additionally, the hospital discharge database records admissions by disease category rather than individuals admitted. Hospital discharge data reported here were coded using ICD-9.

GLOSSARY OF TERMS

95% confidence interval (level): The range of values between +/- 1.96 standard deviations of the sampling distribution of means. The range within which the true value lies with 95% certainty.

Age adjustment: Age adjustment is the application of age-specific rates in a population of interest to a standardized age distribution. It enhances the comparability of populations by controlling for the effects of their differing age compositions. The age-adjusted rate for a population of interest can be compared to that of a different age-adjusted population at the same point in time or the same population at a different point in time.

International Classification of Diseases 9th Revision (ICD-9): A listing of diagnoses and identifying codes used by medical providers for reporting diagnoses. The coding and terminology provide a uniform language that can designate primary and secondary diagnoses and provide reliable, consistent communication on claim forms

Medicaid: A program sponsored by the federal government and administered by states that is intended to provide health care and health-related services to low-income individuals. Each state has a Medicaid program for children through age 18 years and pregnant women, which in Alaska is called Denali Kid Care. The monthly income limit for an uninsured family of four to qualify for Denali Kid Care is \$3,355 (<http://www.hss.state.ak.us/dhcs/DenaliKidCare/>).

Prevalence: A measure of the proportion of people in a population affected with a particular disease at a given time.

Statistical significance: A term based on statistical tests that is used to denote the probability that the observed result could have occurred by chance alone. The most commonly used confidence level for finding statistical significance is 0.05, meaning that there is a 5 percent or less probability that the difference observed was caused by chance.

ASTHMA IN ADULTS



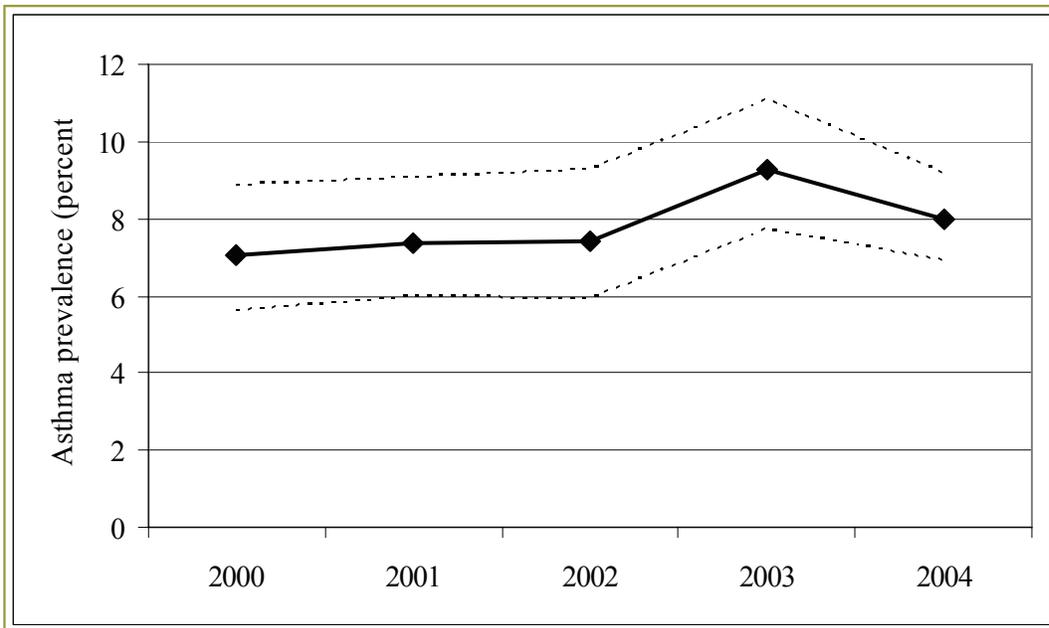
Asthma prevalence in adults from BRFSS

Lifetime and current asthma prevalence among adults

Table 1. Lifetime and current asthma prevalence among adults-Alaska and United States 2002; Alaska BRFSS.

Asthma category	Alaska Percent (95% CI)	United States Percent (95% CI)
Lifetime Asthma	11.5 (9.7, 13.6)	11.8 (11.6, 12.0)
Current Asthma	7.4 (5.9, 9.3)	7.5 (7.3, 7.7)

Figure 1. Trends in current asthma prevalence among persons 18+ years of age in Alaska; Alaska BRFSS. Dashed lines represent 95% confidence intervals.



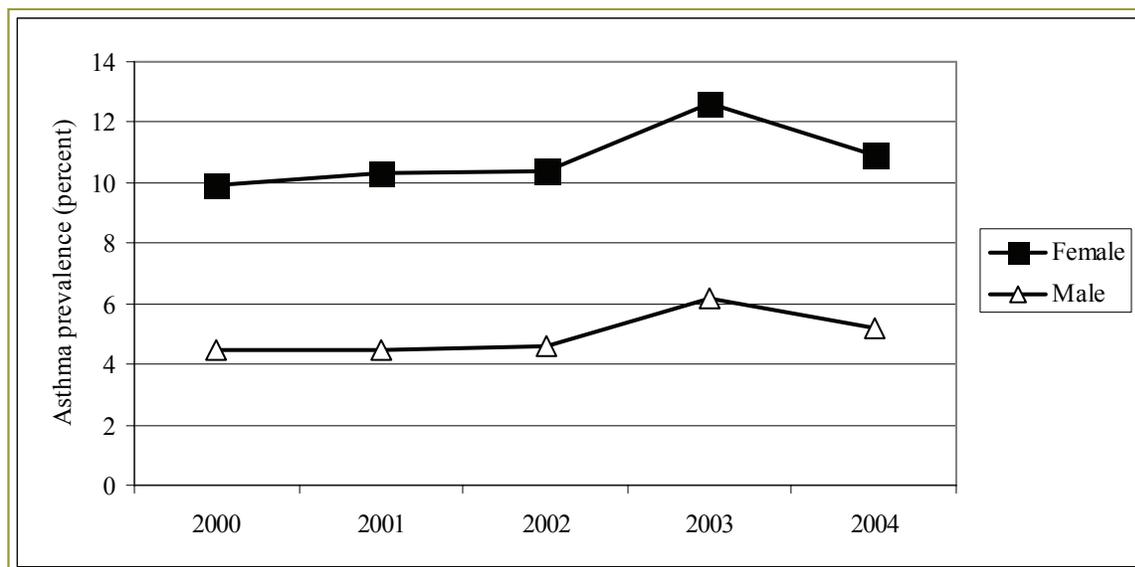
Comment: During 2002, approximately 12% of Alaskan adults reported that they had been told they had asthma at some point in their lives including 7.4% who reported current asthma, approximately the same as the United States as a whole. The percentage of adults reporting current asthma has increased modestly during the past five years. Using the most recent current asthma prevalence of 8% during 2004 and based on the 2004 population of Alaskans 18 years of age and older of 461,887, this indicates that approximately 37,000 adults in Alaska have asthma.

Current asthma prevalence among adults by sex

Table 2. Prevalence of current asthma among adults, by sex-Alaska and United States, 2002.

Sex	Alaska Percent (95% CI)	United States Percent (95% CI)
Males	4.6 (2.9, 7.4)	5.5 (5.3, 5.8)
Females	10.4 (8.2, 13.1)	9.4 (9.1, 9.6)

Figure 2. Trends in current asthma prevalence among persons 18+ years of age in Alaska, by sex; Alaska BRFSS.



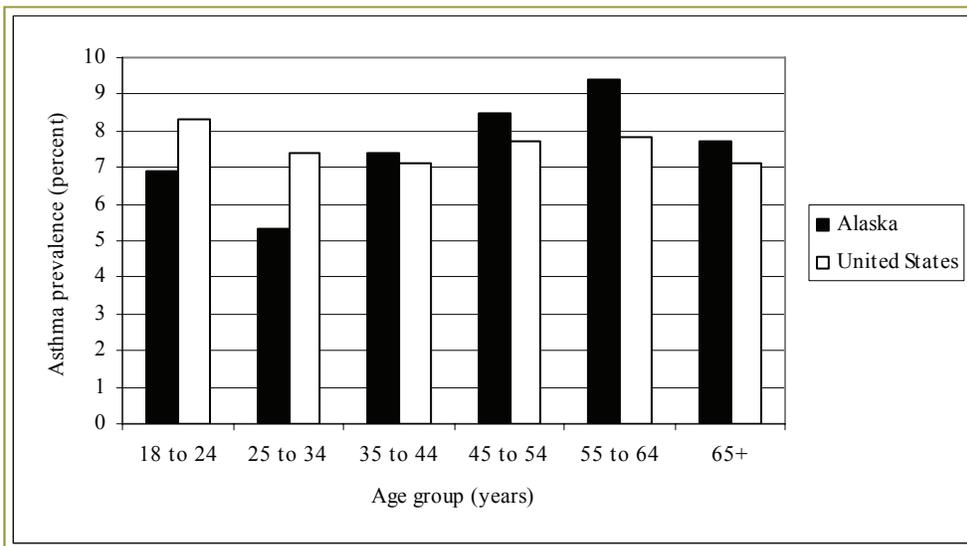
Comment: Male and female adults in Alaska reported current asthma approximately as frequently as their counterparts in the US as a whole. As with the US as a whole, females reported current asthma approximately twice as frequently as males.

Current asthma prevalence among adults by age

Table 3. Prevalence of current asthma among adults by age group; Alaska and United States, 2002.

Age group in years	Alaska Percent (95% CI)	United States Percent (95% CI)
18 to 24	6.9 (2.7, 16.8)	8.3 (7.7, 8.9)
25 to 34	5.3 (3.4, 8.3)	7.4 (6.9, 7.8)
35 to 44	7.4 (4.8, 11.2)	7.1 (6.7, 7.5)
45 to 54	8.5 (5.1, 13.9)	7.7 (7.3, 8.1)
55 to 64	9.4 (5.9, 14.6)	7.8 (7.3, 8.3)
65 and older	7.7 (4.5, 12.7)	7.1 (6.7, 7.6)

Figure 3. Prevalence of current asthma among adults by age group; Alaska and United States, 2002.



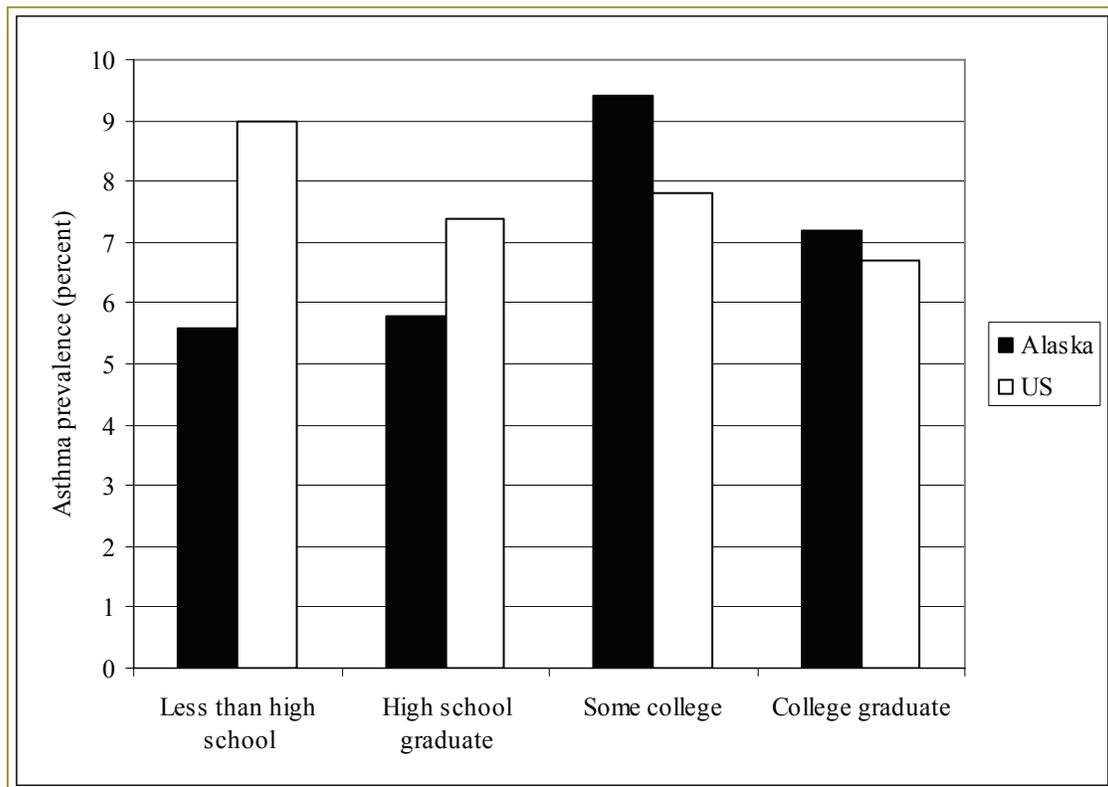
Comment: Older adult Alaskans had higher current asthma prevalences than those who were younger. In the US as a whole, current asthma prevalences were similar across age groups.

Current asthma prevalence among adults by education

Table 4. Prevalence of current asthma among adults by educational level; Alaska and United States, 2002.

Highest educational level attained	Alaska Percent (95% CI)	United States Percent (95% CI)
Less than high school	5.6 (2.3, 13.2)	9.0 (8.4, 9.6)
High school graduate	5.8 (3.8, 8.6)	7.4 (7.1, 7.8)
Some college	9.4 (6.4, 13.4)	7.8 (7.4, 8.2)
College graduate	7.2 (4.8, 10.6)	6.7 (6.4, 7.0)

Figure 4. Prevalence of current asthma among adults by educational level; Alaska and United States, 2002.



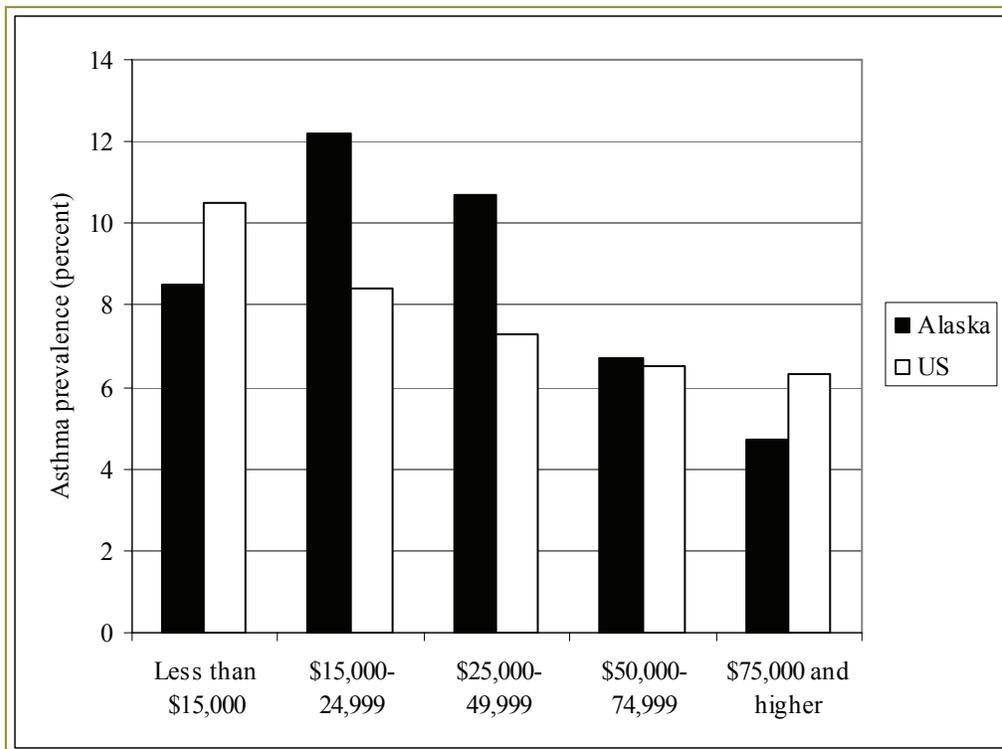
Comment: In Alaska, adults with more education had higher current asthma prevalences while in the United States as a whole, this trend was reversed with less educated adults reporting higher prevalences of current

Current asthma prevalence among adults by income

Table 5. Prevalence of current asthma among adults by income level; Alaska and United States, 2002.

Income level	Alaska	United States
	Percent (95% CI)	Percent (95% CI)
<\$15,000	8.5 (5.0, 14.2)	10.5 (9.8, 11.2)
\$15,000-24,999	12.2 (6.8, 21.0)	8.4 (7.9, 8.8)
\$25,000-49,999	10.7 (7.2, 15.7)	7.3 (6.9, 7.6)
50,000-74,999	6.7 (4.0, 11.1)	6.5 (6.1, 6.9)
\$75,000+	4.7 (2.9, 7.6)	6.3 (5.9, 6.7)

Figure 5. Prevalence of current asthma among adults by income level; Alaska and United States, 2002.



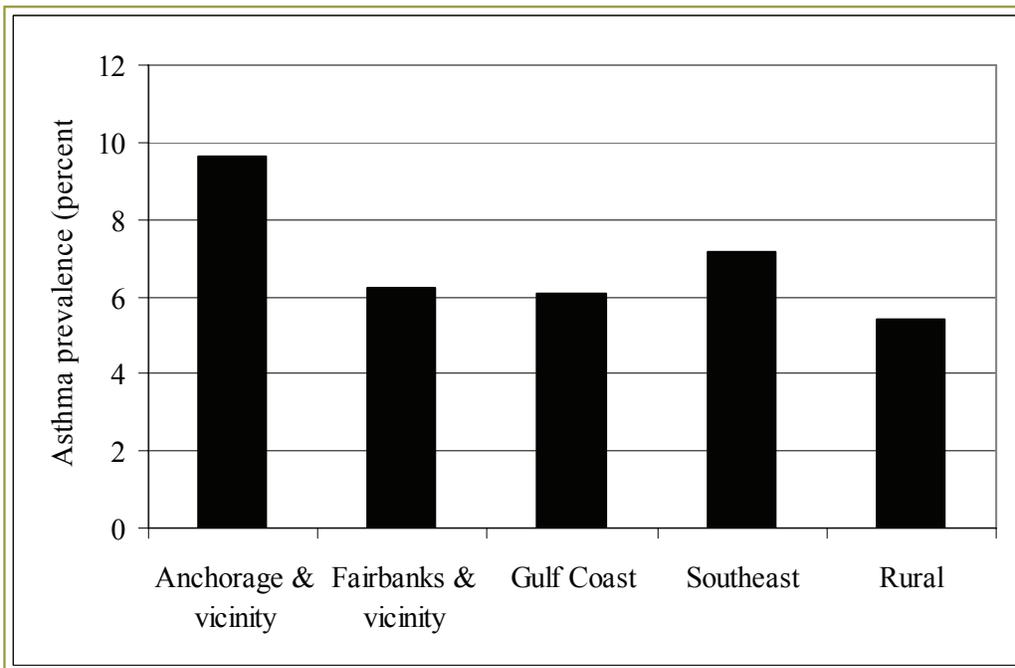
Comment: In Alaska and the United States as a whole, lower income adults reported higher prevalences of current asthma.

Current asthma prevalence among adults by region of residence

Table 6. Prevalence of current asthma among adults by region of residence; Alaska, 2004.

Region of residence	Alaska Percent (95% CI)
Anchorage & vicinity	9.7 (7.8, 11.8)
Fairbanks & vicinity	6.2 (4.8, 8.1)
Gulf Coast	6.1 (4.5, 8.2)
Southeast	7.2 (5.5, 9.4)
Rural	5.4 (4.0, 7.2)

Figure 6. Prevalence of current asthma among adults by region of residence; Alaska and United States, 2004.



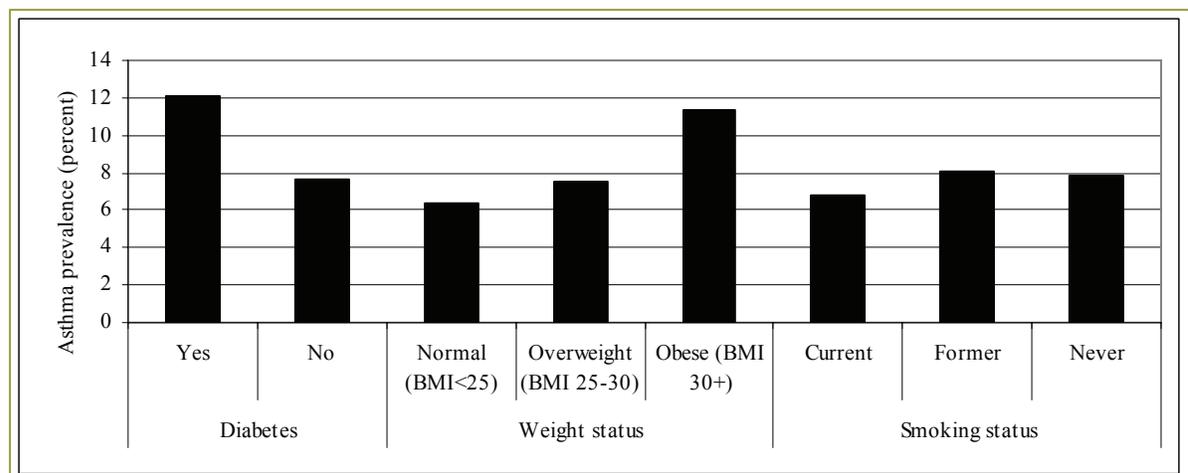
Comment: Adults residing in Anchorage reported the highest prevalence of current asthma while those residing in rural Alaska reported the lowest.

Current asthma prevalence among adults by associated conditions

Table 7. Prevalence of current asthma among adults by associated conditions; Alaska, 2004.

Condition	Asthma prevalence (95% CI)	Percent of respondents with
Diabetes		
Yes	12.1 (7.6, 18.8)	5.0
No	7.6 (6.5, 8.8)	95.0
Weight		
Normal (BMI<25)	6.4 (4.9, 8.3)	37.3
Overweight (BMI 25-30)	7.5 (5.9, 9.6)	37.4
Obese (BMI 30+)	11.4 (8.8, 14.7)	24.4
Smoking status		
Current	6.8 (5.1, 9.2)	26.0
Former	8.1 (6.2, 10.6)	25.8
Never	7.8 (6.5, 9.4)	48.3

Figure 7. Prevalence of current asthma among adults by associated conditions; Alaska, 2004.

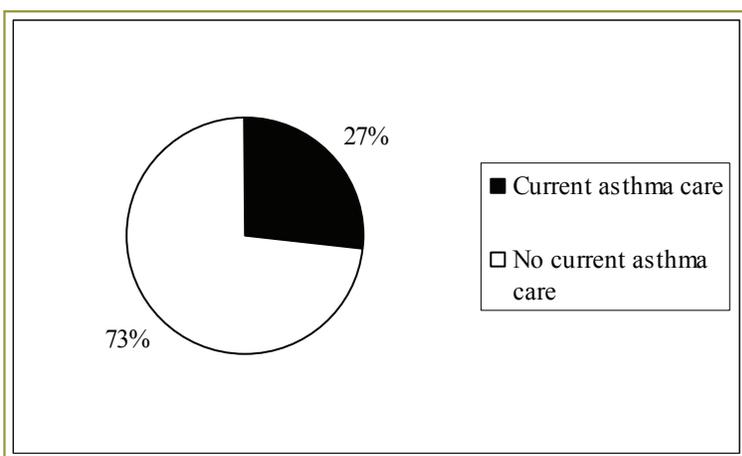


Comment: Adults with diabetes were more likely to report current asthma than other adults; however few BRFSS respondents had diabetes, so this condition contributed little to overall asthma prevalence. Obese adults were more likely to report current asthma than overweight or normal weight adults and almost 25% of respondents were obese, indicating this condition contributed substantially to overall asthma prevalence. There was minimal if any association between smoking status and current asthma prevalence.

Asthma control among adults from BRFSS

Clinical care among adults with current asthma

Figure 8. The proportion of adults with current asthma that received clinical care (one or more visits to an emergency room, physician visits, or routine checkups for asthma during the past year and on asthma medication) during the past 30 days; Alaska BRFSS, 2004.



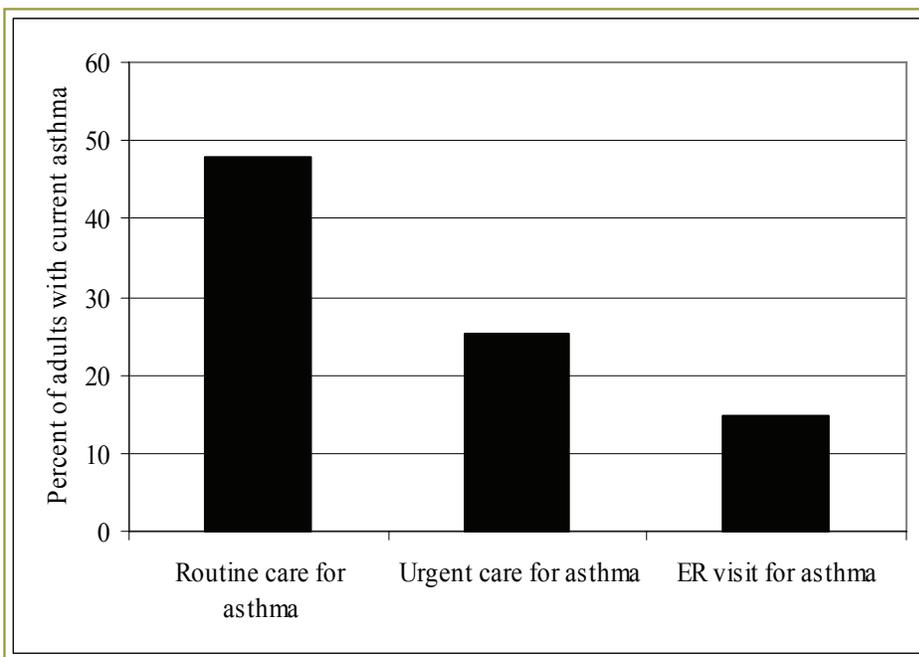
Comment: During 2004, 8% of the population reported current asthma. Of this group 27% reported ongoing medical and pharmacological care, representing 2% of the total Alaska population.

Visits for asthma medical care among adults by type of care

Table 8. The mean number of visits for asthma medical care per person with asthma during the previous 12 months, by type of care; Alaska BRFSS, 2004.

Type of care	Mean occurrences per person	Estimated number of occur-
Routine care (check-up)	1.35	50,000
Urgent care	0.73	27,000
Emergency room visit	0.27	10,000

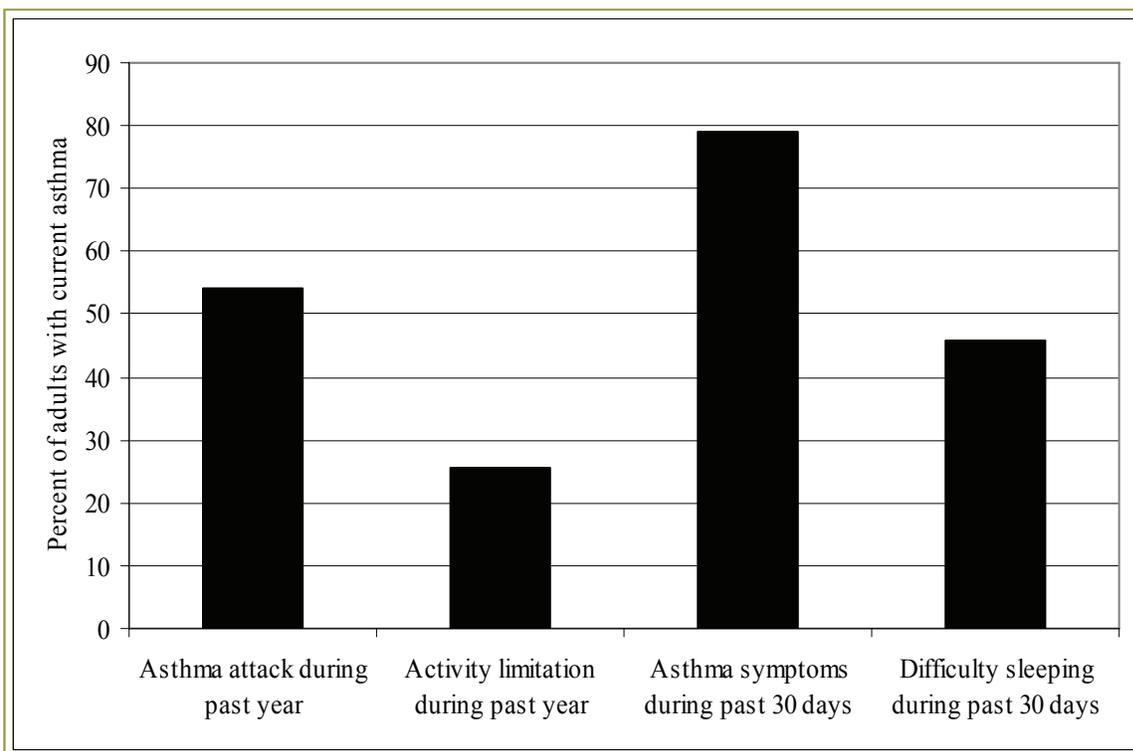
Figure 9. The percent of adults with current asthma that sought different types of care for asthma during the previous 12 months. Alaska BRFSS, 2004.



Comment: During 2004, 8% of the population reported current asthma. Of these persons, almost 50% had at least one check-up for asthma, 25% had urgent asthma care and 12% had an ER visit for asthma. Of the 461,887 Alaskans 18+ years of age, this implies approximately 18,000 had a check-up for asthma, 9,000 received urgent asthma care, and 5,500 received emergency room care for asthma during the previous 12 months. The number of health care visits was substantially higher since many persons who sought care had multiple visits.

Clinical complications among adults with current asthma

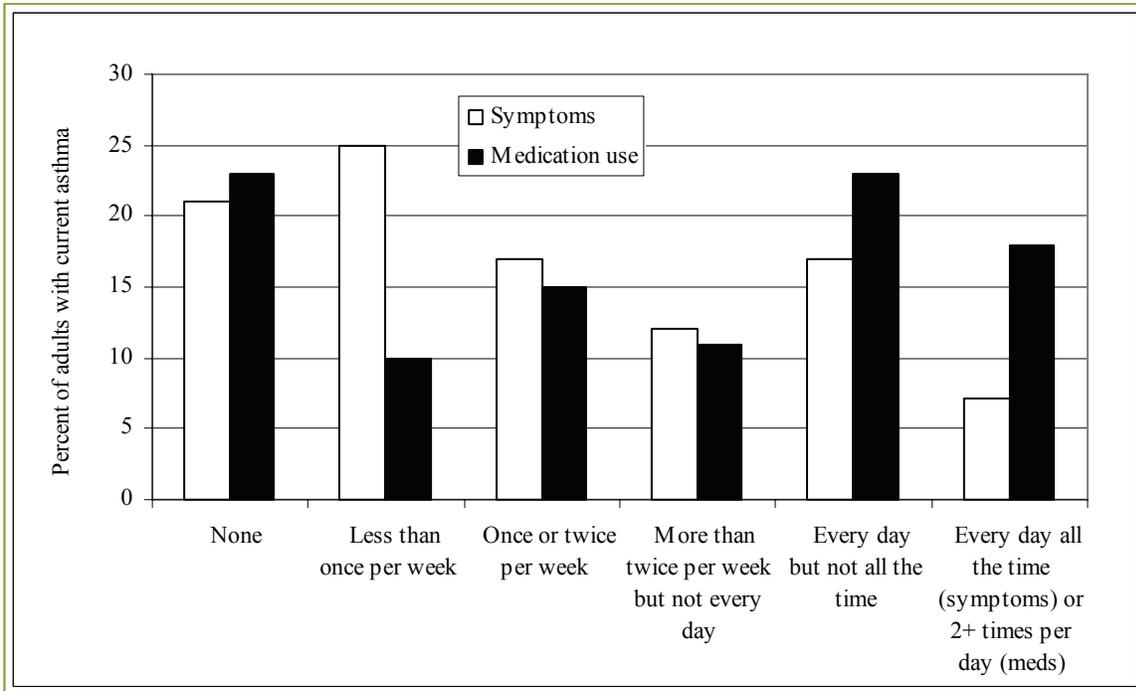
Figure 10. The percent of adults with current asthma that experienced clinical complications as a result of asthma. Alaska BRFSS, 2004.



Comment: Most adults with asthma experience monthly symptoms, including frequently loss of sleep. Over half of adults with asthma experienced at least one asthma attack during the previous year.

Asthma-related symptoms and medication among adults with current asthma

Figure 11. The percent of adults with current asthma that reported asthma-related symptoms and medication use during the previous 30 days, by symptom and medication use frequency; Alaska BRFSS, 2004.



Comment: Over 20% of Alaskan adults with current asthma have symptoms every day and another 33% have symptoms at least weekly. Approximately 40% of adults with current asthma take medications every day.

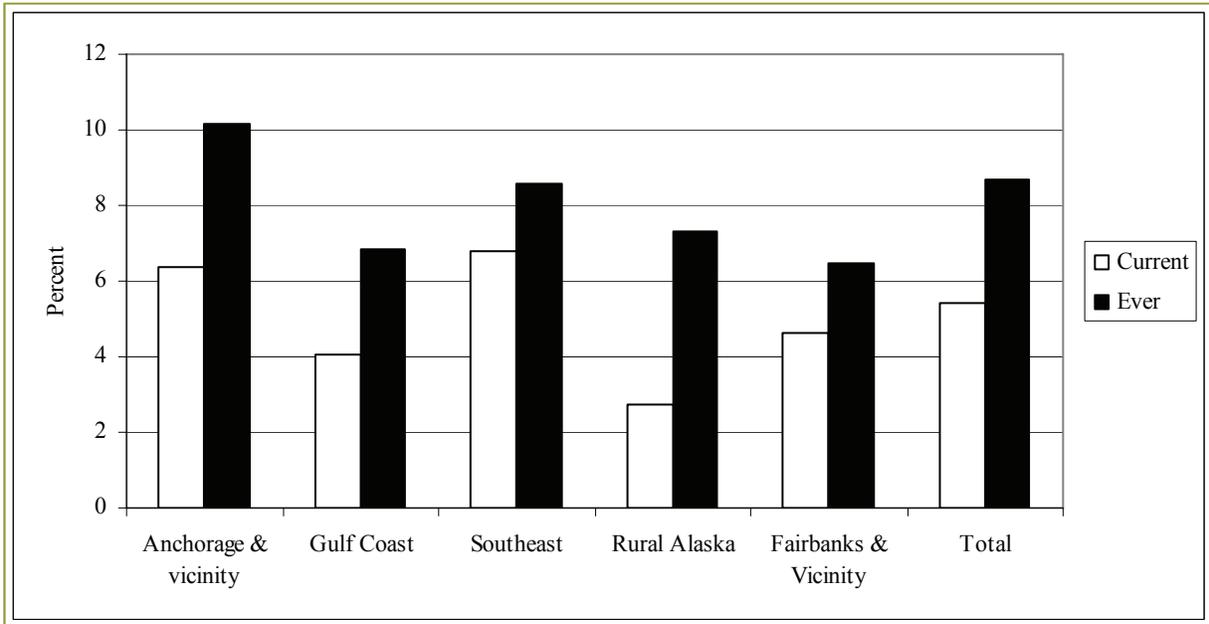
ASTHMA IN CHILDREN



**Asthma Prevalence and Exposure to Tobacco Smoke
From BRFSS**

Percent of adults told their child ever had or currently has asthma by region

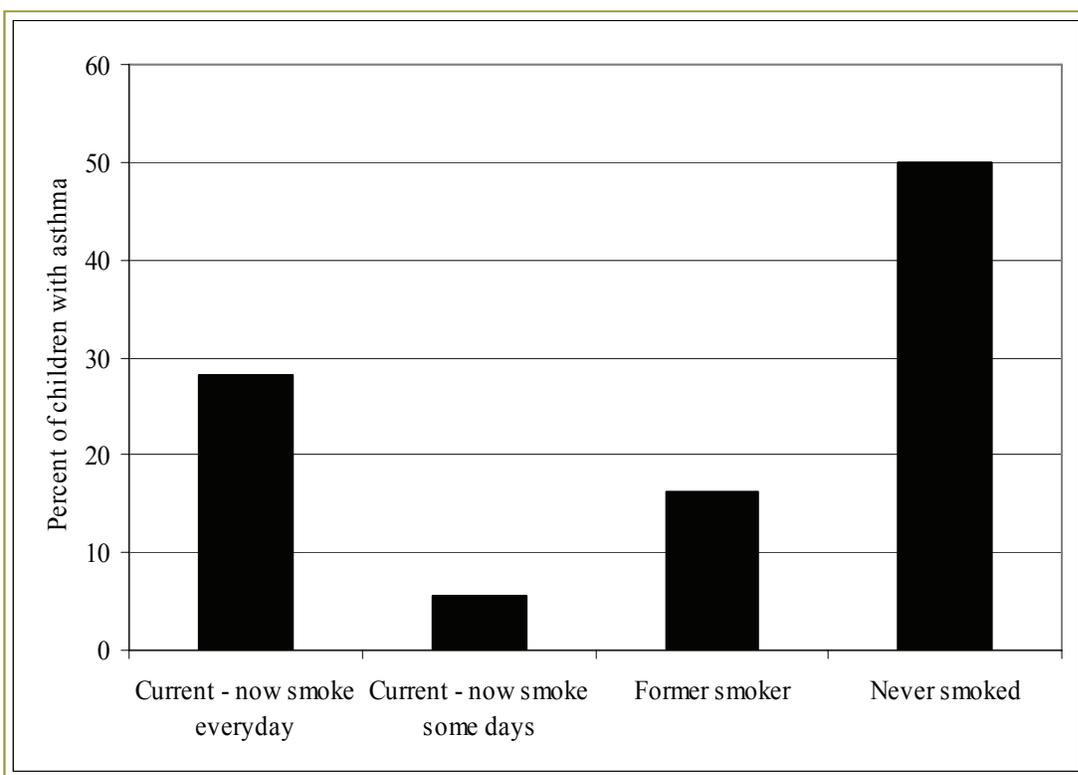
Figure 12. Percent of adults who report that they have been told their child ever had or currently has asthma; Alaska BRFSS, 2004.



Comment: Approximately 5% of adults report that they have a child that currently has asthma while 8% report that they have a child that has ever had asthma. Extrapolated to the 2004 estimate of 193,548 children <18 years of age in Alaska, this implies that approximately 11,000 children in Alaska have asthma.

Percent of children with asthma living with a tobacco cigarette smoker

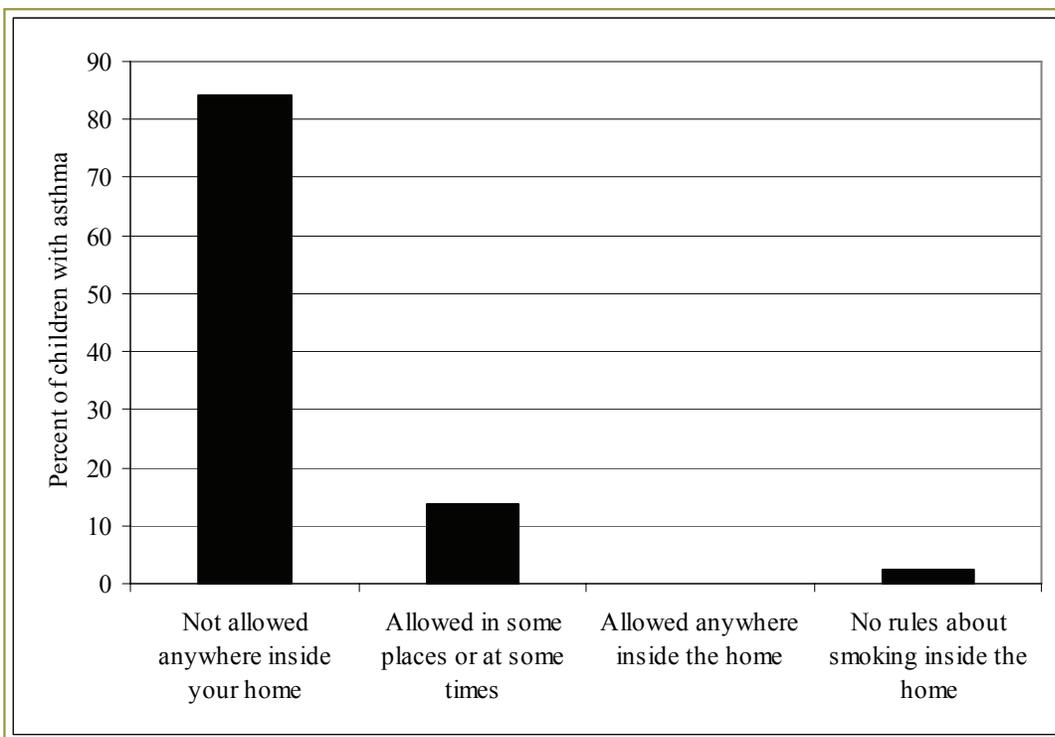
Figure 13. Percent of children with asthma that live with an adult that smokes tobacco cigarettes; Alaska BRFSS, 2004.



Comment: Approximately 34% of children with asthma live with an adult who currently smokes. Thirteen percent of children with asthma live with an adult that has used smoked tobacco during the previous 30 days (data not shown).

Percent of children with asthma by home tobacco smoking policy

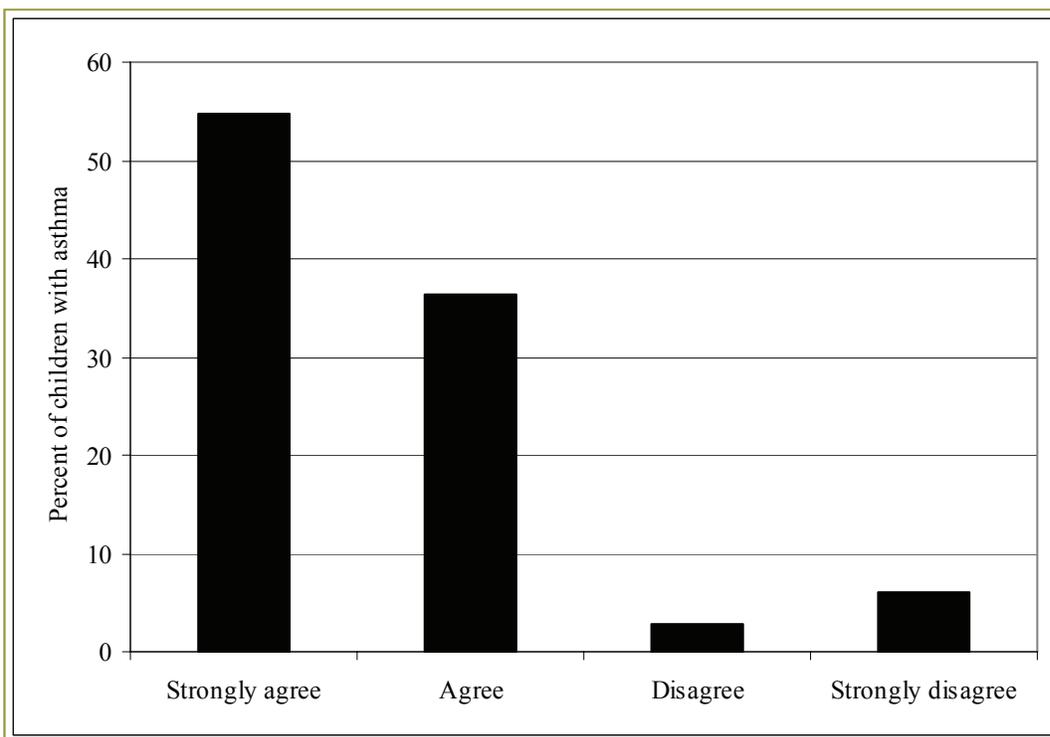
Figure 14. Percent of children with asthma by tobacco smoking policy in the home; Alaska BRFSS, 2004.



Comment: Approximately 16% of children with asthma live in homes where smoking is allowed. Based on the 2004 estimate of 11,000 children with asthma, this implies that approximately 1,760 children with asthma could be routinely exposed to tobacco smoke in the home environment.

Percent of children with asthma by parental attitude toward cigarette smoke

Figure 15. Percent of children with asthma by parental attitude toward the statement that people should be protected from cigarette smoke; Alaska BRFSS, 2004.



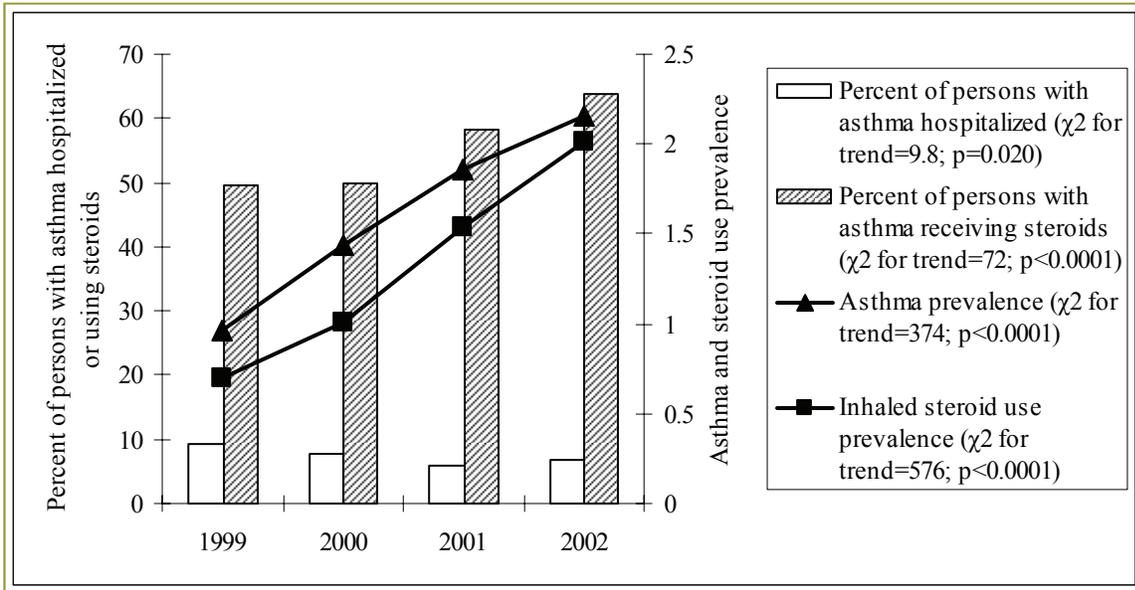
Comment: Approximately 9% of children with asthma live with a parent who disagrees with the idea that people should be protected from cigarette smoke.

Asthma prevalence and medication use from Medicaid

A retrospective review of Alaska Medicaid data was conducted. Asthma was defined as a claim for International Classification of Diseases, 9th Revision (ICD-9) codes 493.0x-493.9x plus a claim for asthma-associated medication during the same calendar year. Analysis was limited to persons <20 years of age enrolled in Medicaid during 1999-2002. Compared to BRFSS, the Medicaid analysis was performed on a different age group (<20 years for Medicaid vs. <18 years for BRFSS), used a different definition of asthma, and was conducted during different years. Consequently, results of Medicaid and BRFSS analysis cannot be directly compared.

Pediatric asthma prevalence and medication use among Medicaid recipients

Figure 16. Asthma prevalence and medication use among Medicaid recipients less than 20 years of age, by year of service; Alaska, 1999-2002.



Comment: Among persons <20 years of age, the yearly asthma prevalence increased steadily from 1.0 to 2.2% over the study period, while among persons <20 years of age with asthma, the percent that were hospitalized decreased. Inhaled corticosteroid use increased from 0.70 to 2.0% among all Medicaid recipients and from 50% to 64% among persons with asthma. The mean number of inhaled corticosteroid prescriptions filled by persons with asthma increased from 1.0 per year during 1999 to 1.7 per year during 2002 (data not shown).

ASTHMA BY ALASKA NATIVE STATUS AND ANCHORAGE RESIDENCE

In large measure, Alaska Natives and non-Natives receive care from different health care systems. Alaska Natives usually receive care through regional Alaska Native Health Corporations and the Alaska Tribal Health Consortium while non-Natives receive care through private medical providers. Additionally, rural residence often predicts a lower risk of asthma but an increased risk of asthma outcomes among those who experience asthma. In Alaska, the only major urban center is Anchorage, with close to half of the state's population. We examined the risk of asthma outcomes within four groups: Alaska Native Anchorage and non-Anchorage residents and non-Native Anchorage and non-Anchorage residents. For many outcomes identified through BRFSS, too few Alaska Native Anchorage residents were sampled to provide meaningful results and thus in most cases results for this group are not presented.



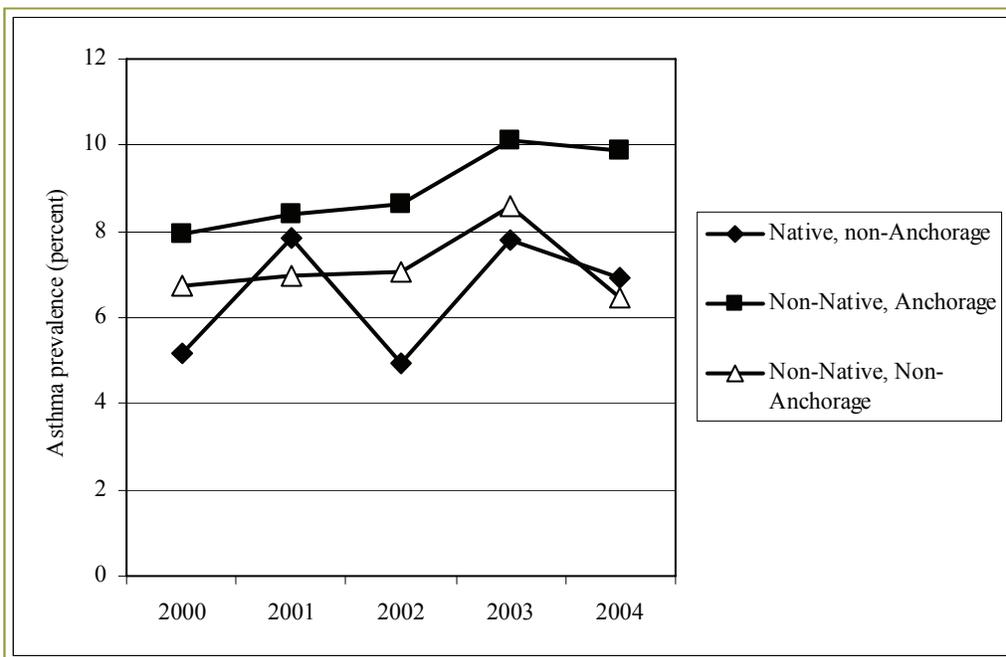
**Asthma prevalence and control
among adults from BRFSS by Alaska
Native & Anchorage status**

Trends in lifetime and current asthma prevalence among adults
by race and residence

Table 9. Prevalence of lifetime and current asthma among adults by Alaska Native status and Anchorage residence; Alaska, 2004. Note that too few Alaska Native Anchorage residents were sampled to perform meaningful analysis of current asthma.

Risk group	Lifetime asthma Percent (95% CI)	Current asthma Percent (95% CI)
Alaska Native, Anchorage	11.2 (3.2, 32.7)	Data not sufficient
Alaska Native, Non-Anchorage	9.2 (6.6, 12.7)	5.9 (3.7, 9.1)
Non-Native, Anchorage	12.2 (9.1 to 16.0)	8.4 (5.8, 12.0)
Non-Native, non-Anchorage	12.0 (10.2, 14.1)	6.9 (5.6, 8.4)

Figure 17. Trends in current asthma prevalence among adults by Alaska Native status and Anchorage residence; Alaska BRFSS, 2000-4. Note that too few Alaska Native Anchorage residents were sampled to perform meaningful analysis.



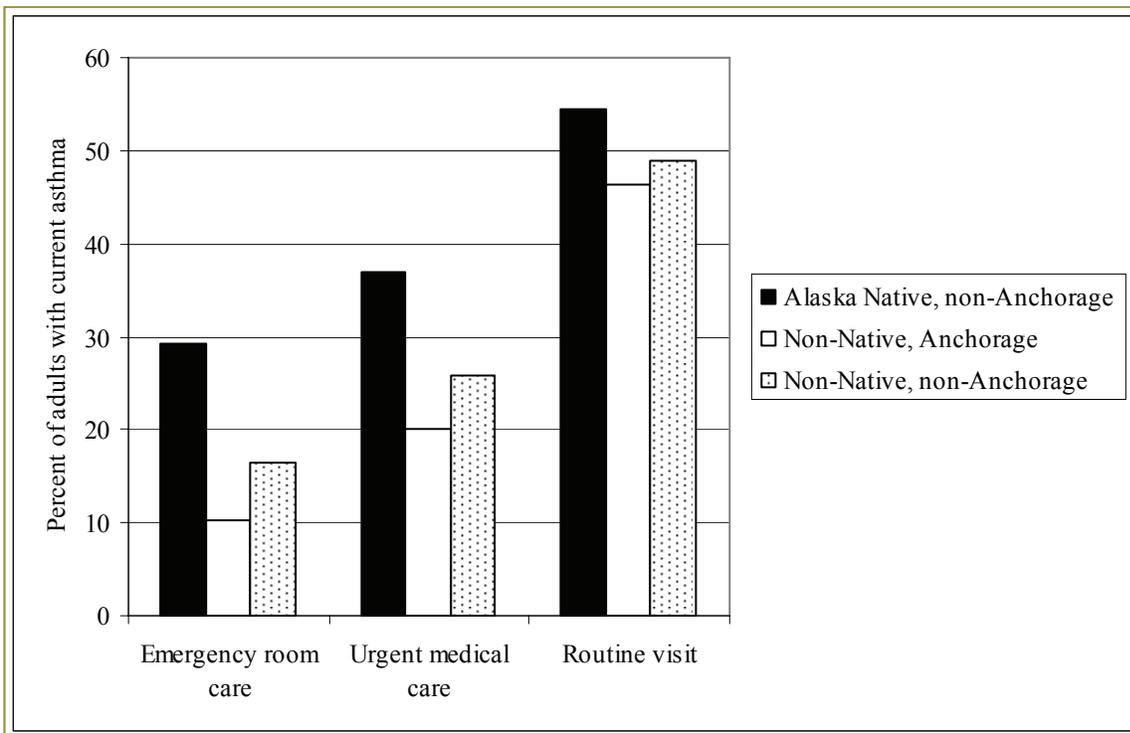
Comment: Non-Native adults residing in Anchorage had the highest prevalence and the steepest and most consistent increase in reported current asthma of risk groups examined. Rural Alaska Natives reported the lowest prevalence of lifetime and current asthma.

Asthma care among adults, by race and residence

Table 10. The mean number of visits for asthma-related medical care per person with asthma during the previous 12 months, by type of care, Alaska Native status, and Anchorage residence; Alaska BRFSS, 2004. Note that too few Alaska Native Anchorage residents were sampled to perform meaningful analysis.

Type of care	Alaska Native, Non-	Non-Native, An-	Non-Native, non-
Routine care	1.68	1.36	1.27
Urgent care	0.94	0.65	0.78
Emergency	0.61	0.18	0.28

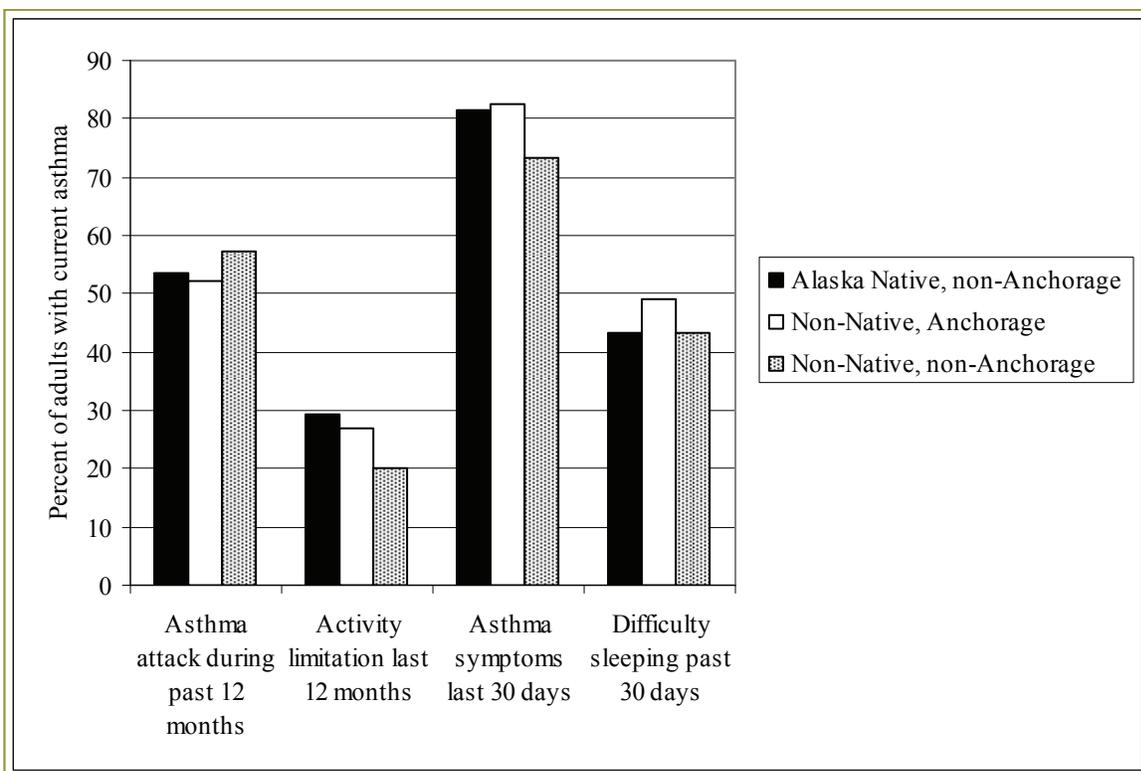
Figure 18. The percent of adults with current asthma that sought different types of asthma care during the previous 12 months, by Alaska Native status and Anchorage residence; Alaska BRFSS, 2004. Note that too few Alaska Native Anchorage residents were sampled to perform meaningful analysis.



Comment: Alaska Native adults with asthma residing outside of Anchorage were substantially more likely to seek care urgently, including through an emergency room, than non-Natives residing in or outside of Anchorage. Among all three evaluated groups, adults with current asthma were equally likely to see routine care.

Clinical complications among adults with asthma, by race and residence

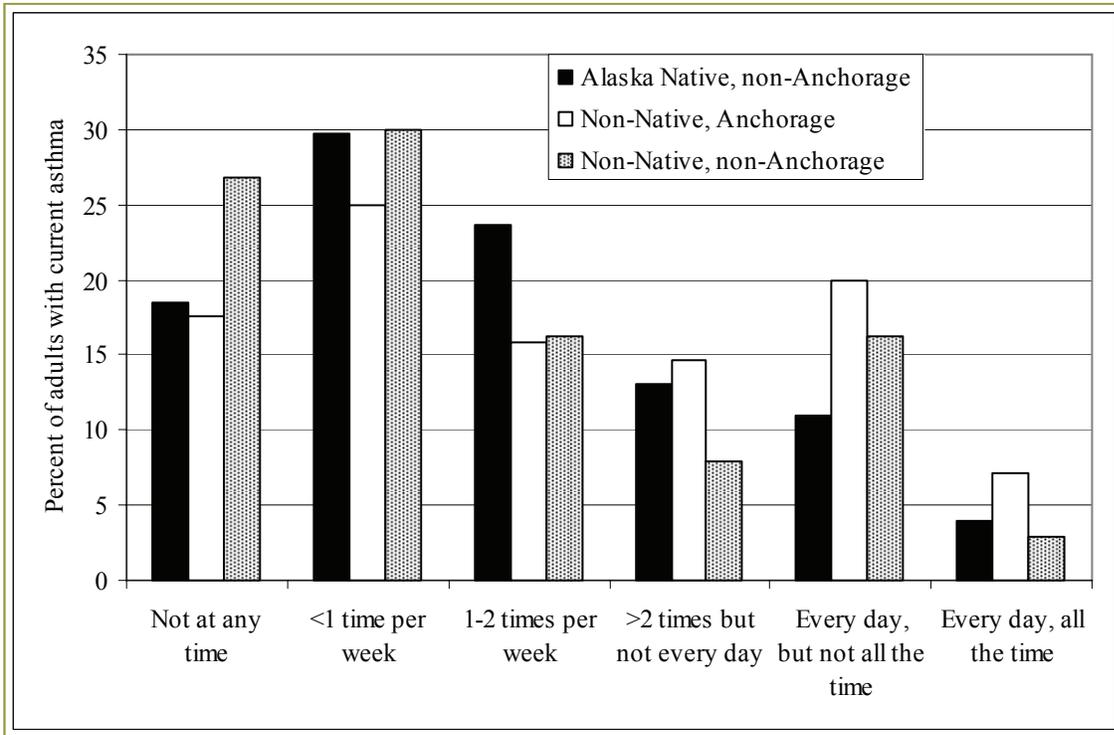
Figure 19. The percent of adults with current asthma that experienced clinical complications as a result of asthma, by Alaska Native status and Anchorage residence; Alaska BRFSS, 2004. Note that too few Alaska Native Anchorage residents were sampled to perform meaningful analysis.



Comment: Among adults with asthma, there were no substantial differences in clinical complications by Alaska Native status or Anchorage residence.

Asthma symptoms among adults, by race and residence

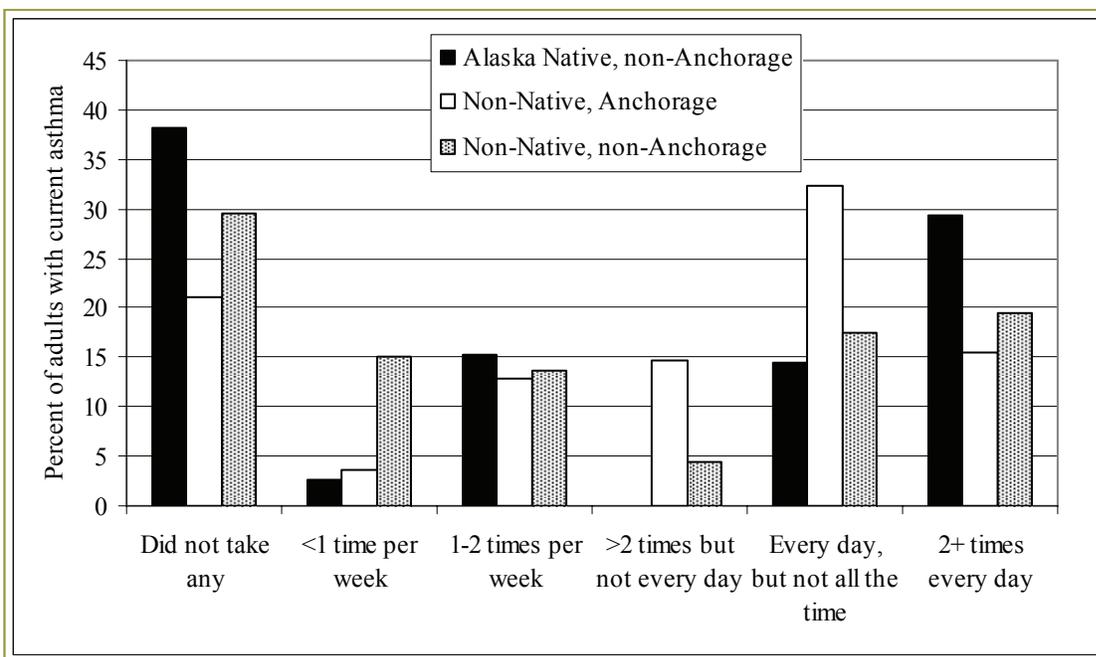
Figure 20. The percent of adults with current asthma reporting symptoms during the previous 30 days, by symptom frequency, Alaska Native status and Anchorage residence; Alaska BRFSS, 2004. Note that too few Alaska Native Anchorage residents were sampled to perform meaningful analysis.



Comment: Among adults with current asthma, Alaska Natives living outside of Anchorage were less likely to report daily symptoms than non-Natives living within or outside of Anchorage. Among non-Natives living in Anchorage, 27% reported having symptoms every day.

Asthma medication use among adults by race and residence

Figure 21. The percent of adults with current asthma reporting medication use during the previous 30 days, by medication use frequency, Alaska Native status and Anchorage residence; Alaska BRFSS, 2004. Note that too few Alaska Native Anchorage residents were sampled to perform meaningful analysis.

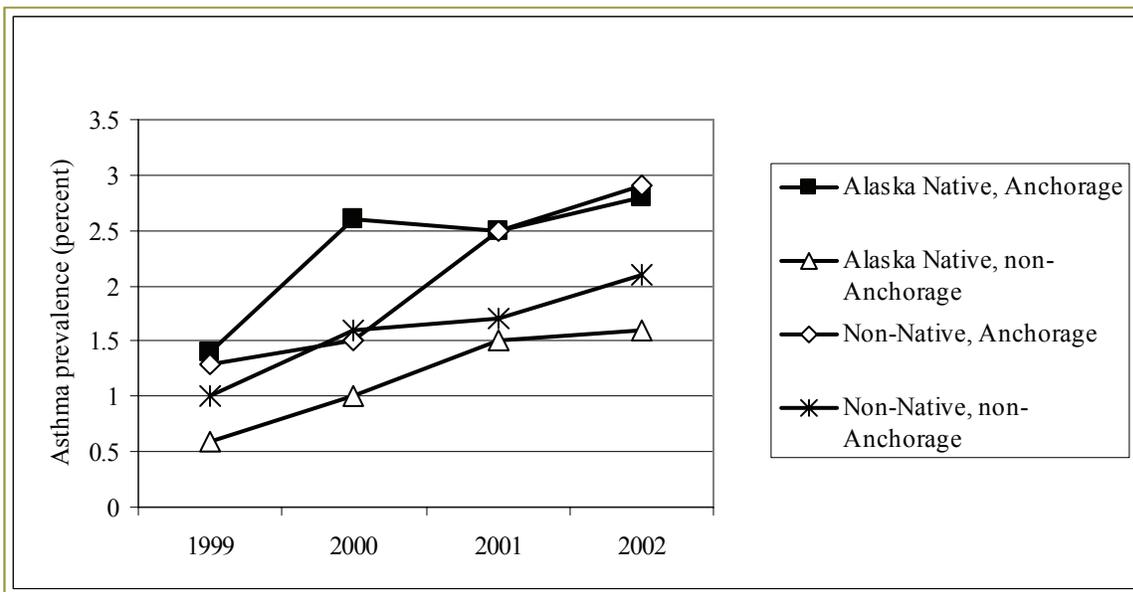


Comment: Among adults with current asthma, Alaska Native status and Anchorage residence were not associated with taking medications every day.

**Asthma prevalence and medication use
among children from Medicaid by Alaska
Native & Anchorage status**

Pediatric asthma prevalence among Medicaid recipients, by race and residence

Figure 22. Asthma prevalence among Medicaid recipients less than 20 years of age, by year of service, race, and residence; Alaska, 1999-2002.



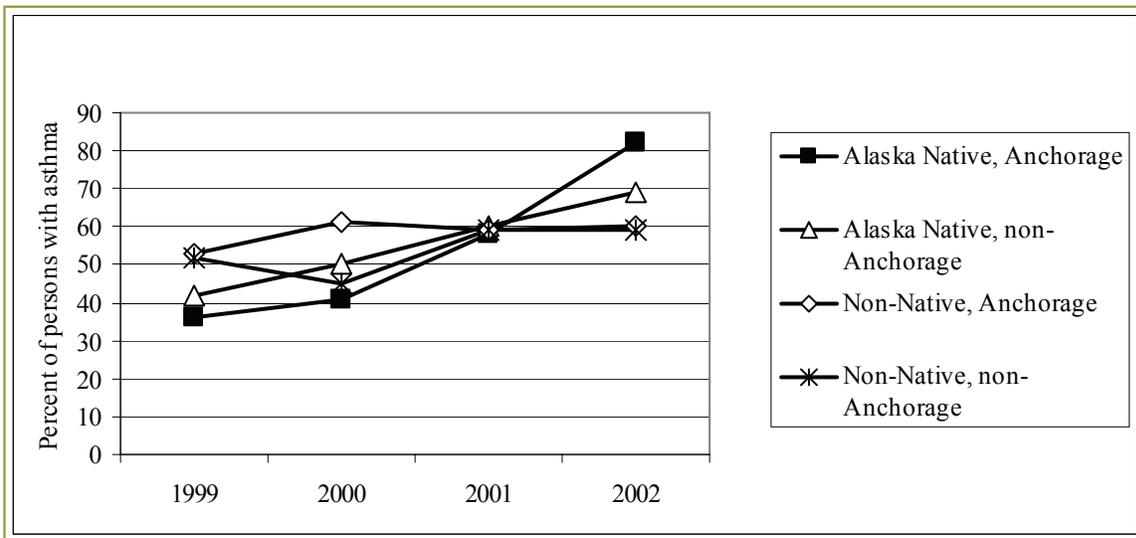
Comment: During 1999-2002, asthma prevalence increased among all groups regardless of Alaska Native status or residence. Prevalence was highest among Anchorage residents regardless of Alaska Native status and lowest among Alaska Native non-Anchorage residents. These differences could be related to true differences in asthma prevalence or differences by providers in different areas and serving different clients in the use of asthma as a diagnosis.

Pediatric asthma medication use among Medicaid recipients
by race and residence

Table 11. The mean number of prescriptions filled per year for inhaled corticosteroids among persons with asthma less than 20 years of age, by Alaska Native status and Anchorage residence; Alaska, 1999-2002.

Year	Alaska Native, Anchorage	Alaska Native, non-Anchorage	Non-Native, Anchorage	Non-Native, non-Anchorage
1999	0.41	0.77	1.1	1.3
2002	1.9	1.8	1.6	1.6

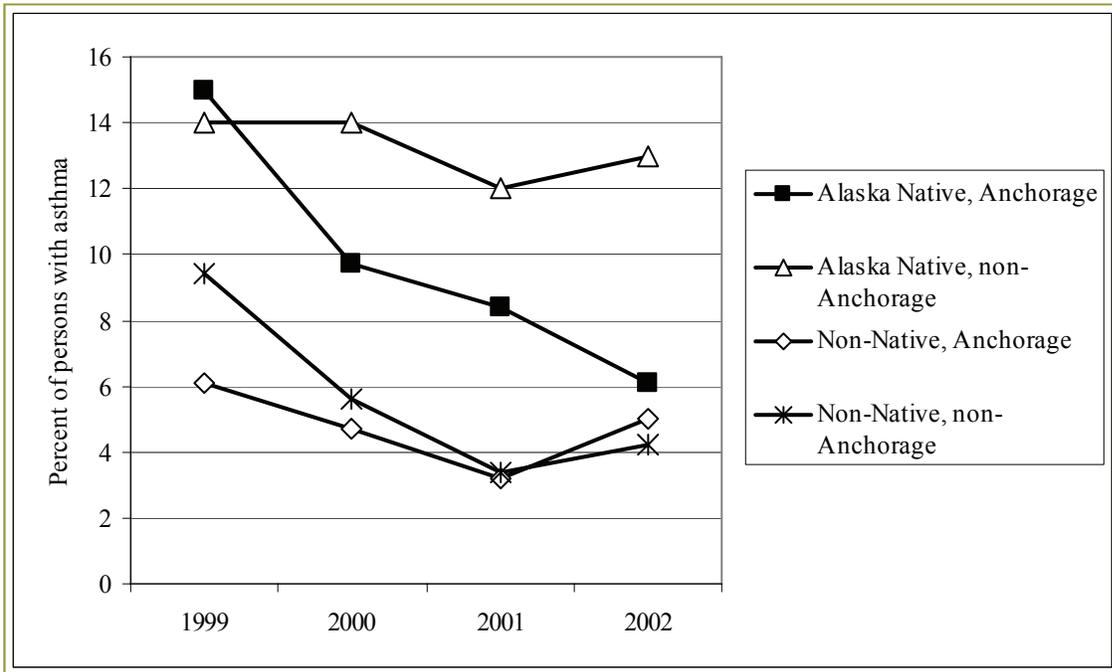
Figure 23. The percent of persons with asthma who filled a prescription for an inhaled corticosteroid among Medicaid recipients less than 20 years of age, by year of service, race, and residence; Alaska, 1999-2002.



Comment: During 1999-2002, the proportion of persons <20 years of age with asthma who filled a prescription for inhaled corticosteroids increased among all groups, but rose most dramatically among Alaska Natives residing in Anchorage. During 1999, Alaska Natives with asthma were less likely than non-Natives to fill a prescription for inhaled corticosteroids regardless of Anchorage residence; by 2002, however, this association had reversed.

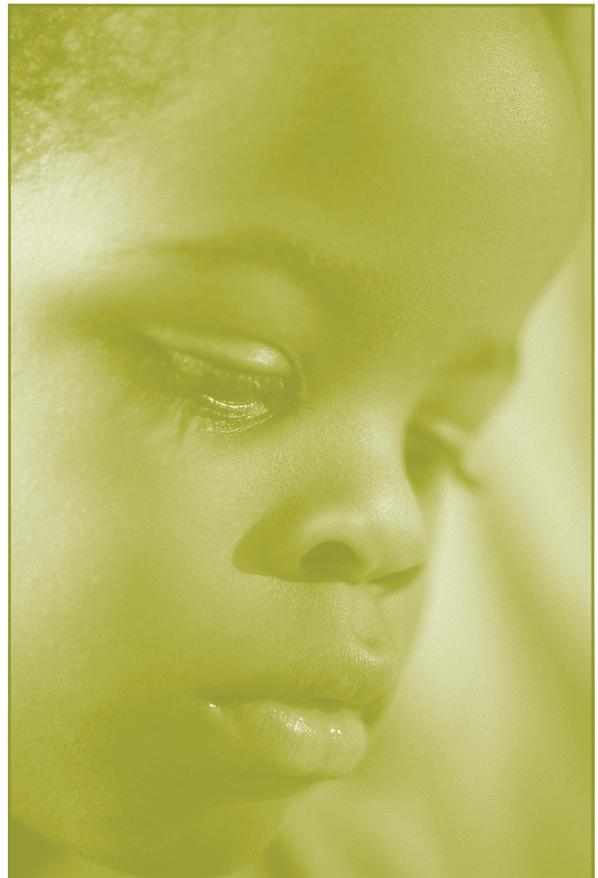
Pediatric asthma hospitalization among Medicaid recipients
by race and residence

Figure 24. The percent of persons with asthma hospitalized for asthma among Medicaid recipients less than 20 years of age, by year of service, race, and residence; Alaska, 1999-2002.



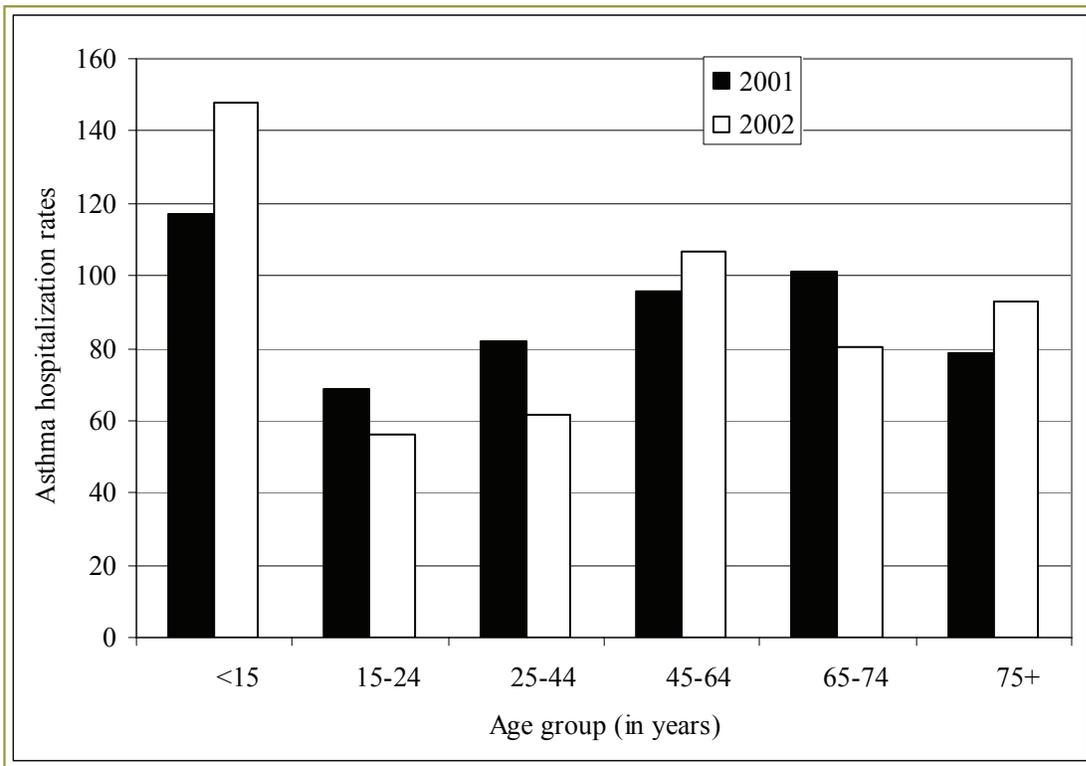
Comment: During 1999, Alaska Natives with asthma were substantially more likely to be hospitalized for asthma than non-Natives regardless of Anchorage residence. By 2002, Alaska Natives with asthma residing in Anchorage had experienced a 250% decrease in hospitalization for asthma while Alaska Natives residing outside of Anchorage had no change in hospitalization.

Asthma Hospital Discharges



Asthma hospitalization rates, by age group and admission year

Figure 25. Hospitalization rates (per 10,000 persons per year) for asthma as the primary diagnosis, by age group and year of admission. Alaska Hospital Discharge Database, 2001-2002. Total hospitalizations = 467 during 2001 and 492 during 2002.



Comment: The risk of hospitalization for asthma is highest for children and lowest for older teens and young adults. Nevertheless, all age groups experienced substantial risk for asthma hospitalization.

Asthma Hospital Costs



Asthma hospitalization charges

Table 12. Average charge per discharge with asthma as the primary diagnosis; Alaska Hospital Discharge Database.

Age Group	2001	2002	2003	2004	Total
<15	\$ 6,831	\$ 6,989	\$ 6,572	\$ 8,836	\$ 7,333
15-24	\$ 7,288	\$ 9,100	\$ 5,896	\$ 8,011	\$ 7,546
25-44	\$ 7,918	\$ 9,469	\$ 8,487	\$ 9,697	\$ 8,862
45-64	\$ 8,524	\$11,204	\$11,318	\$10,351	\$10,385
65-74	\$ 10,371	\$12,954	\$11,104	\$13,628	\$11,795
75+	\$ 10,970	\$12,456	\$13,765	\$13,609	\$12,625
Total	\$ 8,185	\$ 9,513	\$ 8,965	\$ 9,991	\$ 9,165

Table 13. Total charges for discharges with asthma as the primary diagnosis; Alaska Hospital Discharge Database.

Age Group	2001	2002	2003	2004	Total
<15	\$867,487	\$1,181,187	\$ 1,025,219	\$ 1,413,771	\$ 4,487,664
15-24	\$284,233	\$ 300,290	\$ 188,675	\$ 200,285	\$ 973,483
25-44	\$783,837	\$ 738,620	\$ 653,462	\$ 872,748	\$ 3,048,666
45-64	\$895,011	\$1,344,465	\$ 1,222,355	\$ 1,128,273	\$ 4,590,104
65-74	\$477,057	\$ 440,432	\$ 521,881	\$ 436,101	\$ 1,875,471
75+	\$383,955	\$ 523,148	\$ 440,468	\$ 394,658	\$ 1,742,229
Total	\$3,691,580	\$4,528,142	\$ 4,052,060	\$ 4,445,835	\$ 16,717,617

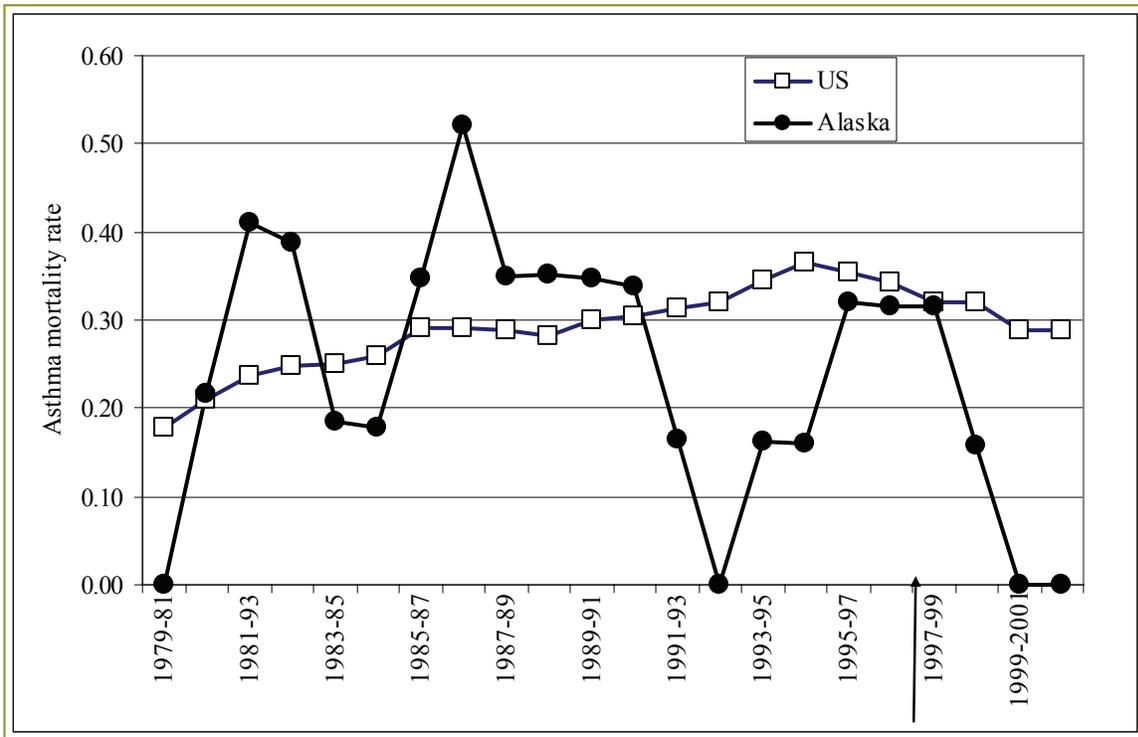
Comment: Between 2001 and 2004, charges for hospitalizations for asthma totaled almost \$17 million, approximately \$9200 per hospitalization. Because not all hospitals reported to this system, the total expenditures during this period were even higher.

Asthma Mortality



Pediatric asthma mortality

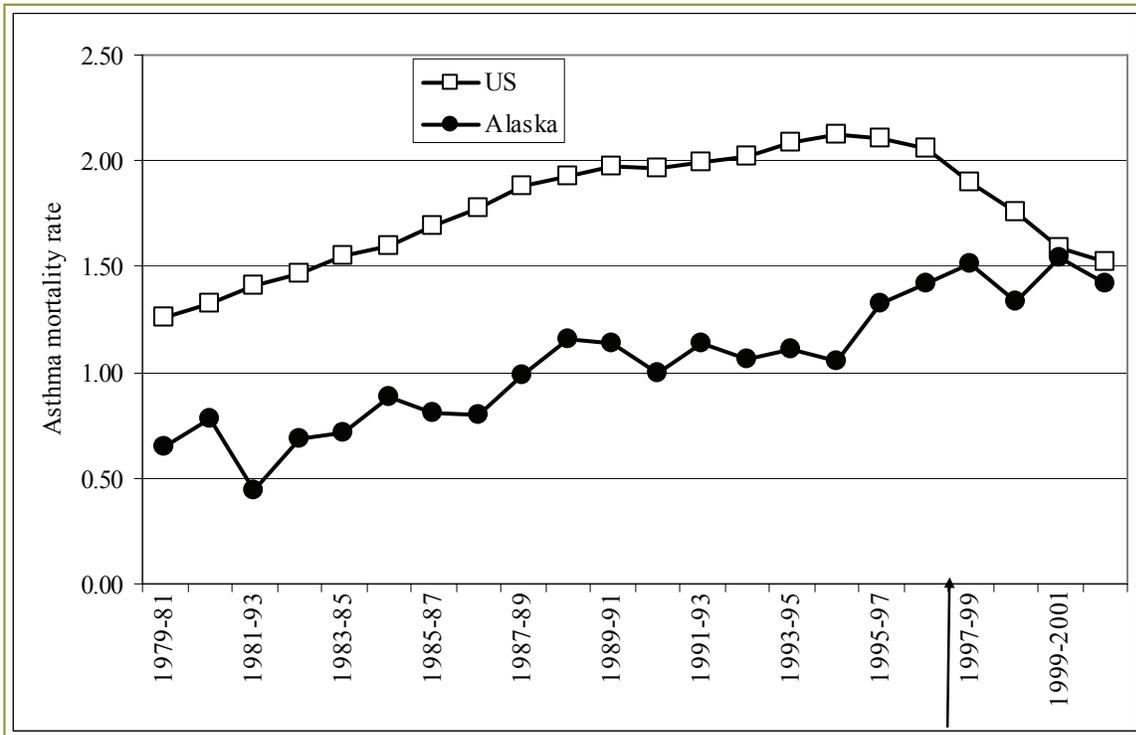
Figure 26. Asthma specific mortality rates (per 100,000 persons per year) among persons <20 years of age in the US and Alaska, by three year moving averages. The arrow indicates the point at which data includes ICD-10 coding. National Center for Health Statistics, 1979-2002.



Comment: Childhood asthma mortality increased in the United States until approximately 1995 when rates began decreasing. The number of asthma deaths in children in Alaska was too few to make statements about trends. During the 14 years evaluated, Alaska recorded 10 childhood asthma deaths for a rate of 0.22 per 100,000 per year, approximately 25% lower than the 0.30 per 100,000 per year seen in the US as a whole.

Asthma mortality among all persons

Figure 27. Asthma specific mortality rates (per 100,000 persons per year) among all persons in the US and Alaska by three year moving averages. The arrow indicates the point at which data includes ICD-10 coding. National Center for Health Statistics, 1979-2002.



Comment: Asthma mortality in the US increased until 1994 with a subsequent substantial and sustained decrease. Further decreases occurring since 1999 may reflect true improvements or result from the switch from ICD-9 to ICD-10. By contrast, in Alaska asthma mortality has consistently risen during the 14 years evaluated such that as of 2002, Alaska had an asthma mortality rate almost identical to that of the US as a whole. During the entire 14-year study period, 144 Alaskans died with asthma as the underlying cause of death, a rate of 1.1 per 100,000 per year; this is approximately 30% lower than the 1.7 per 100,000 per year seen in the US as a whole.

Appendix A. Asthma related questions from the Alaska Behavioral Risk Factor Surveillance System

In addition to the core asthma related questions, during 2004 Alaska also used optional Module 9: Adult Asthma History and optional module 10: Childhood Asthma Prevalence. The complete BRFSS questionnaire may be found at http://www.cdc.gov/brfss/questionnaires/pdf-ques/2004_brfss.pdf.

Core asthma-related questions

9.1 Have you ever been told by a doctor, nurse or other health professional that you had asthma?

- 1 Yes
- 2 No (Go to next section)
- 7 Don't know/Not sure (Go to next section)
- 9 Refused (Go to next section)

9.2 Do you still have asthma?

- 1 Yes
- 2 No
- 7 Don't know/Not sure
- 9 Refused

Childhood Asthma Prevalence

1. Has a doctor, nurse or other health professional EVER said that the child has asthma?

- 1 Yes
- 2 No (Go to next module)
- 7 Don't know/Not sure (Go to next module)
- 9 Refused (Go to next module)

2. Does the child still have asthma?

- 1 Yes
- 2 No
- 7 Don't know/Not sure
- 9 Refused

Previously you said you were told by a doctor, nurse or other health professional that you had asthma.

1. How old were you when you were first told by a doctor, nurse or other health professional that you had asthma?
 - — Age in years 11 or older
 - 9 7 Age 10 or younger
 - 9 8 Don't know/ Not sure
 - 9 9 Refused

2. During the past 12 months, have you had an episode of asthma or an asthma attack?
 - 1 Yes
 - 2 No
 - 7 Don't know/ Not sure
 - 9 Refused

3. During the past 12 months, how many times did you visit an emergency room or urgent care center because of your asthma?
 - — Number of visits (**87 = 87 or more**)
 - 8 8 None
 - 9 8 Don't know/ Not sure
 - 9 9 Refused

4. **(If one or more visits to Q3, fill in "Besides those emergency room visits)**
 During the past 12 months, how many times did you see a doctor, nurse or other health professional for urgent treatment of worsening asthma symptoms?
 - — Number of visits (**87 = 87 or more**)
 - 8 8 None
 - 9 8 Don't know/ Not sure
 - 9 9 Refused

5. During the past 12 months, how many times did you see a doctor, nurse or other health professional for a routine checkup for your asthma?
 - — Number of visits (**87 = 87 or more**)
 - 8 8 None
 - 9 8 Don't know/ Not sure
 - 9 9 Refused

6. During the past 12 months, how many days were you unable to work or carry out your usual activities because of your asthma?

____ Number of days
 8 8 8 None
 7 7 7 Don't know/ Not sure
 9 9 9 Refused

7. Symptoms of asthma include cough, wheezing, shortness of breath, chest tightness and phlegm production when you don't have a cold or respiratory infection. During the past 30 days, how often did you have any symptoms of asthma? **Would you say—**

Please read:

8 Not at any time (Go to Q9)
 1 Less than once a week
 2 Once or twice a week
 3 More than 2 times a week but not every day
 4 Every day but not all the time

OR

5 Every day, all the time

Do not read:

7 Don't know/ Not sure
 9 Refused

8. During the past 30 days, how many days did symptoms of asthma make it difficult for you to stay asleep? **Would you say—**

Please read:

8 None
 1 One or two
 2 Three to four
 3 Five
 4 Six to ten

Or

5 More than ten

Do not read:

- 7 Don't know/ Not sure
- 9 Refused

9. During the past 30 days, how many days did you take a prescription asthma medication to PREVENT an asthma attack from occurring?

Please read:

- 8 Never
- 1 1 to 14 days
- 2 15 to 24 days
- 3 25 to 30 days

Do not read:

- 7 Don't know/ Not sure
- 9 Refused

10. During the past 30 days, how often did you use a prescription asthma inhaler DURING AN ASTHMA ATTACK to stop it?

INTERVIEWER INSTRUCTION: How often (number of times) does NOT equal number of puffs. Two to three puffs are usually taken each time the inhaler is used.

Read only if necessary:

- 8 Never (include no attack in past 30 days)
- 1 1 to 4 times (in the past 30 days)
- 2 5 to 14 times (in the past 30 days)
- 3 15 to 29 times (in the past 30 days)
- 4 30 to 59 times (in the past 30 days)
- 5 60 to 99 times (in the past 30 days)
- 6 100 or more times (in the past 30 days)

Do not read:

- 7 Don't know? Not sure
- 9 Refused

Appendix B. Healthy People 2010 and Health Alaskans 2010 Objectives for Asthma

Healthy People 2010 Objectives

24-1: Reduce asthma deaths

- From 2.1 to 1.0 per million in children less than 5 years of age
- From 3.3 to 1.0 per million in children 5 to 14 years of age
- From 5.0 to 3.0 per million in persons 15 to 34 years of age
- From 18 to 9.0 per million in 35 to 64 years of age
- From 86 to 60 per million in persons 65 years of age and older

24-2: Reduce hospitalizations for asthma

- From 46 to 25 per 10,000 in children less than 5 years of age
- From 13 to 7.7 per 10,000 persons 5 to 64 years of age
- From 18 to 11 per 10,000 in persons 65 years of age and older

24-3: Reduce hospital emergency department visits for asthma

- From 150 to 80 per 10,000 in children less than 5 years of age
- From 71 to 50 per 10,000 in persons 5 to 64 years of age
- From 30 to 15 per 10,000 persons 65 years of age and older

24-4: Reduce activity limitations among persons with asthma from a 1994-6 baseline level of 20% to 10% by 2010.

24-5: Reduce the number of school or work days missed by persons with asthma due to asthma. (Developmental)

24-6: Increase the proportion of persons with asthma who receive formal patient education, including information about community and self-help resources, as an essential part of the management of their condition from a 1998 baseline level of 8.4% to 30% by 2010. (Developmental)

24-7: Increase the proportion of persons with asthma who receive appropriate asthma care according to the NAEPP Guidelines. (Developmental)

24-8: Establish in at least 25 states a surveillance system for tracking asthma death, illness, disability, impact of occupational and environmental factors on asthma, access to medical care, and asthma management. (Developmental)

Healthy Alaskans 2010 Objectives:

24-1: Reduce hospitalizations for asthma. (Developmental)

24-2a: Reduce lifetime asthma prevalence from 11% to 8%.

24-2b: Reduce current asthma prevalence from 7% to 5%.

24-3: Reduce the proportion of adults whose activities are limited due to chronic lung and breathing problems. (Developmental)