Asthma and Socioeconomic Status in Washington State

The role of socioeconomic status on asthma management, insurance coverage, medication use, and asthma triggers

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2 About This Report

For the Washington State Asthma Program and our partners, clarifying and addressing the asthma burden and inequities is a priority. Information in this report can be used to identify and understand the relationship of socioeconomic status with asthma management, medication use, insurance coverage, and other asthma indicators among Washington residents.

This report also includes information about who is affected by asthma, status of asthma healthcare, and the impact the home environment has on asthma. It will help target interventions to specific audiences, and help prioritize areas that need immediate action. A short list of recommended strategies and interventions is also included in the report.

Report Data

This report presents data about Washington adults only. Data were mainly obtained from:

- Washington Behavioral Risk Factor Surveillance System (BRFSS)
- BRFSS Adult Asthma Callback Survey

See the Appendix to learn more about these surveys.

Lifetime and Current Asthma

This report makes a distinction between people who have ever been diagnosed with asthma – referred to *as lifetime asthma* – and those who have *current asthma*. Lifetime asthma can provide a clearer picture of how many people have been affected by the disease at some point in their life.

To estimate the number of people affected by asthma, people are asked "Has a doctor or other health professional ever told you that you had asthma?" Those who answer "yes" are considered to have **lifetime asthma**. People who report that they have lifetime asthma are then asked: "Do you still have asthma?" Those who answer "yes" to both questions are considered to have **current asthma**.

For most of the analysis presented in this report, current asthma is used to describe the burden of the disease. There are many overlapping individual and environmental influences that contribute to asthma. Any reference to differences between groups implies the differences are statistically detectable unless otherwise stated. We have used the following phrase to describe populations with the disease.

- With asthma – refers to people with current asthma

Socioeconomic Status

The socioeconomic status (SES) of people and where they live and work can strongly influence their health. For the purposes of this report,

- Low-income refers to individuals with income less than $35,000
- Medium-income refers to individuals with income in the range of $35,000 to $75,000
- High-income refers to individuals with income of $75,000 or more

3 Background

Asthma is a chronic lung disease that makes breathing difficult during episodes of wheezing and breathlessness. These episodes are reversible, either spontaneously or with treatment.

Asthma is one of the most common chronic diseases and has been recognized as a growing public health concern. Asthma differs in severity, symptom presentation, and responsiveness to treatment. There is no cure for asthma, but symptoms can sometimes improve over time. People with asthma use more healthcare resources and are at higher risk of poor health outcomes. With quality health care, good self-management, trigger reduction, and medical treatment, most people with asthma can live normal, productive lives.

Socioeconomic status (SES) is a complex concept. No single measure can fully account for a person's SES. Many factors including, but not limited to, education, occupation, income, and neighborhood characteristics can contribute to a person's socioeconomic status.[1] Most studies use a single indicator to understand the possible effects of SES on health. This report uses income categories to define SES.

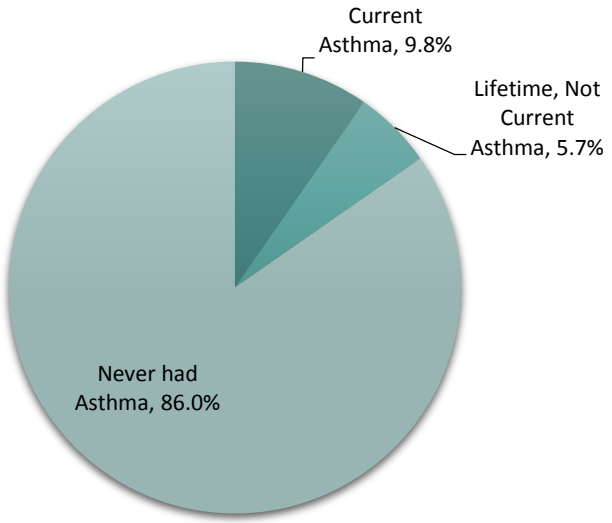
There are prominent disparities in asthma prevalence among different racial and ethnic groups, and level of education or income. Lack of insurance, environmental risk factors, poor mental health, and inadequate or unavailable medical care play a significant role in the apparent links among race, ethnicity, poverty, and asthma.[2]

4 Asthma Demographics

Lifetime and current asthma among adults in Washington State

More than one in six Washington adults have been told by a health professional at some point during their lifetime that they have asthma. [3]

Figure 1. Adults with asthma



Washington Behavioral Risk Factor Surveillance System, 2011

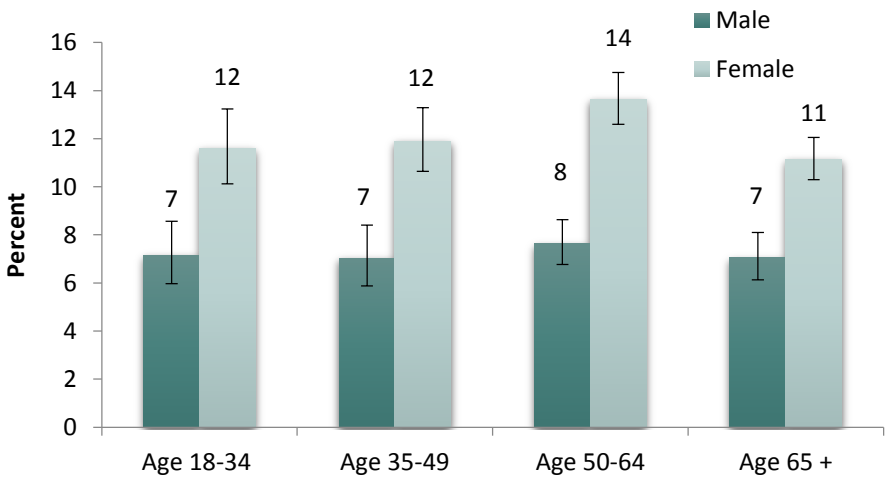
More than 800,000 Washington adults are estimated as ever having lifetime asthma and over 500,000 are estimated to have current asthma. [3]

Asthma prevalence by age and sex

Overall, adult females are more likely to report having current asthma than adult males. This is true across all adult age groups [Figure 2].

Similar gender-related disparities in asthma prevalence are seen in national data[4] and throughout epidemiological literature. No single explanation for these differences has been identified. Some of the potential explanations include biological differences – such as sex hormones or increased bronchial hyper-responsiveness – and sociocultural differences – such as differing perceptions of airflow obstruction or medication compliance.[5, 6]

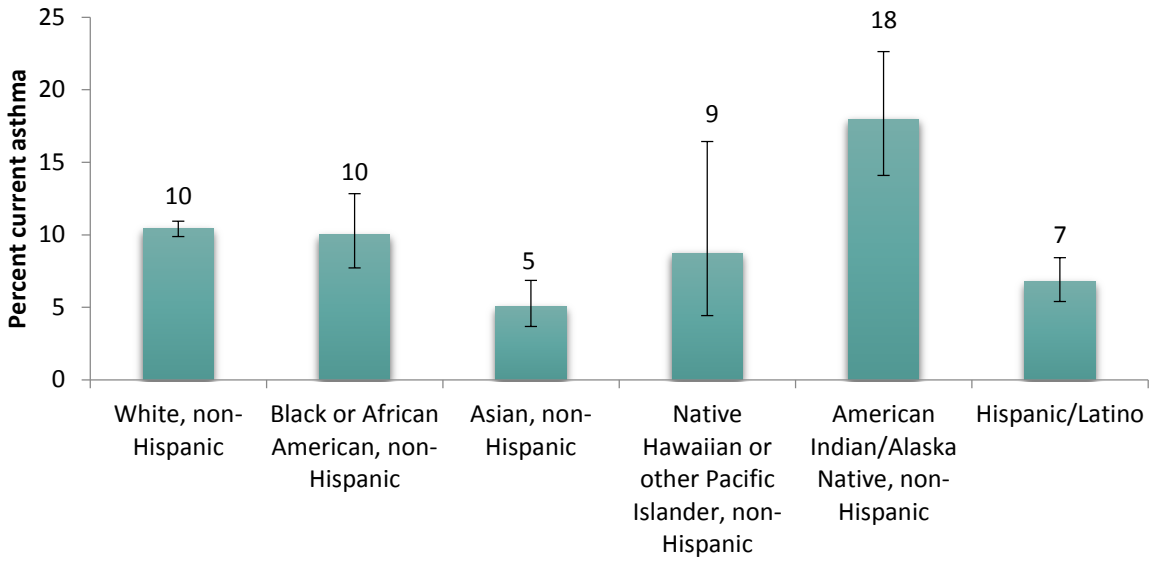
Figure 2. Adults with current asthma by age and sex



Washington Behavioral Risk Factor Surveillance System, 2009-2011; Age-standardized

Asthma prevalence by race and Hispanic origin

Figure 3. Adults with current asthma by race and Hispanic origin



Washington Behavioral Risk Factor Surveillance System, 2009-2011. Age-standardized

Non-Hispanic American Indians and Alaskan Natives are more likely to report having asthma than other racial and Hispanic origin groups [Figure 3]. Persons of Asian or Hispanic origin (any race) are less likely to have asthma than other racial and Hispanic origin groups. These patterns are consistent with national data.[4]

Many environmental and individual factors have been suggested as potential causes for asthma inequities by race, ethnicity, and income. These include: [7]

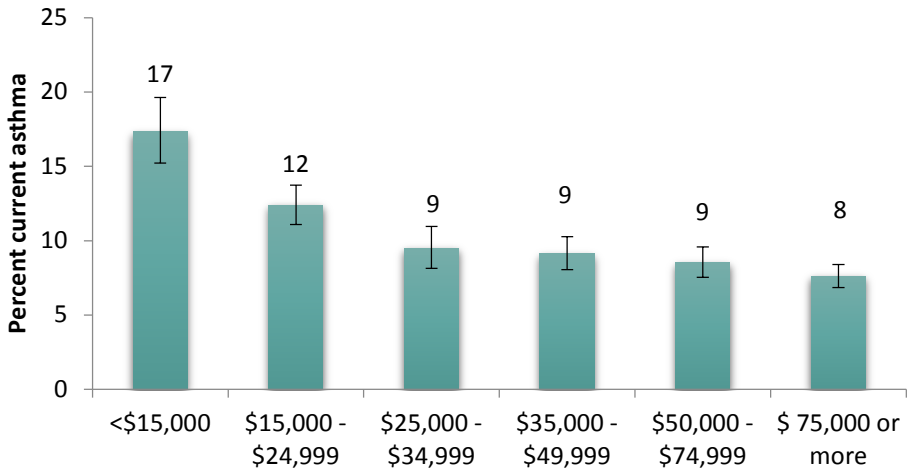
- exposure to indoor and outdoor air pollutants due to deteriorated housing, location of housing near traffic and/or industrial pollutants, and exposure to tobacco smoke;
- genetics;
- unequal access to care and quality of care;
- under- or incorrect use of asthma preventive medicines;
- variations in provider cultural competency and communication styles;
- and psychosocial factors such as symptom perception, stress, and social support.

Socioeconomic indicators

The socioeconomic status (SES) of people and where they live and work strongly influence their health.[8] As discussed in the background, there are many indicators of SES used in health research. Looking at multiple indicators to understand the complex connection between asthma and SES would be ideal. However, in Washington State, only household income and educational attainment indicators are regularly available through BRFSS.

Prevalence by income

Figure 4. Adults with current asthma by annual household income



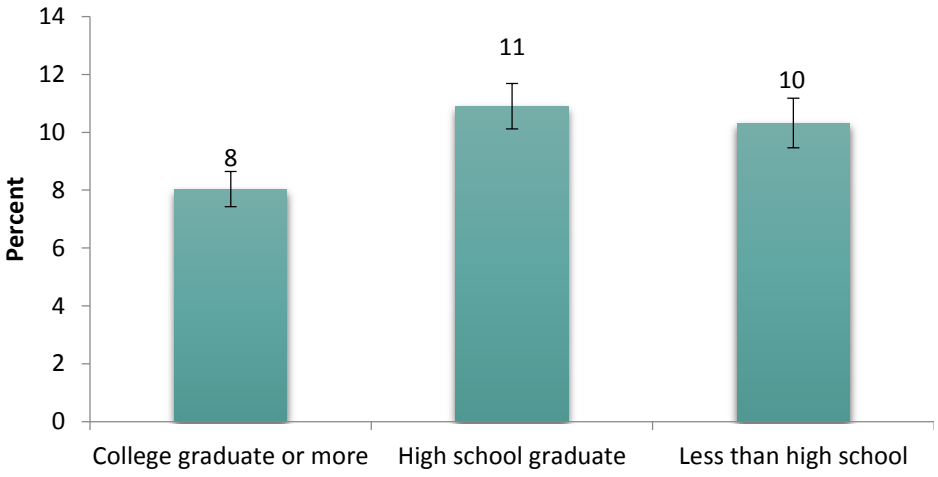
Washington Behavioral Risk Factor Surveillance System, 2009-2011. Age-standardized

There is a strong connection between current asthma and income levels. Washingtonians living in a household with an annual income of less than $15,000 are consistently more likely to report having asthma than all other income levels. People in the lowest income category are more than twice as likely to report asthma when compared to people with household incomes of $75,000 or more per year [Figure 4].

Prevalence by educational attainment

Adults 25 and older who have completed four years of college were less likely to report current asthma than people with less education [Figure 5]. There is no clear difference in reported asthma between high school graduates who did not complete college and people with less than high school education reported.

Figure 5. Adults with current asthma by educational attainment



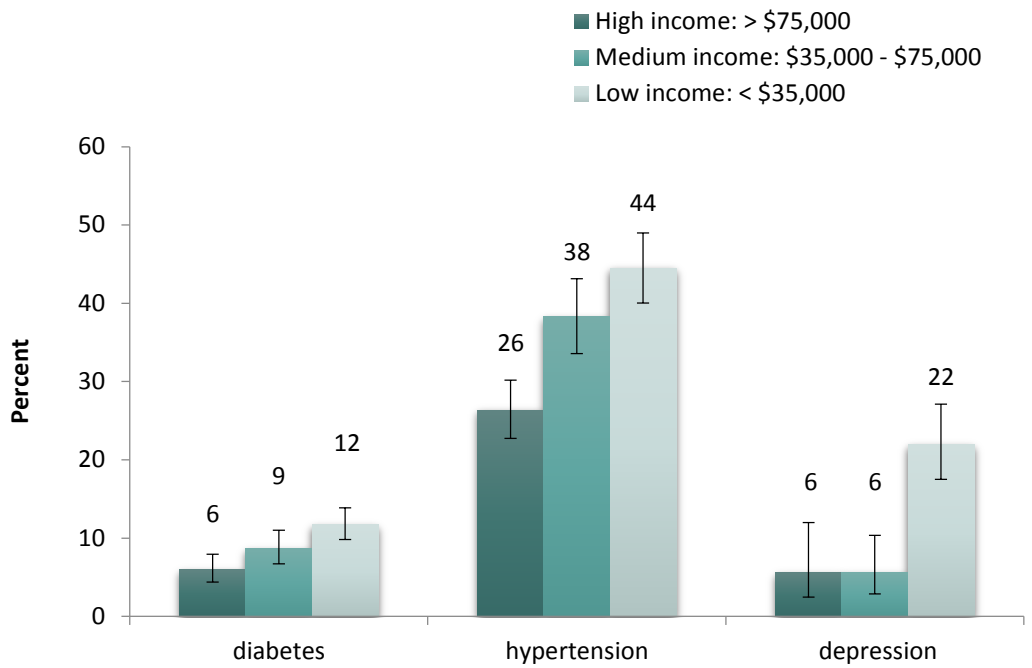
Estimates include respondents ages 25 years or older only
Washington Behavioral Risk Factor Surveillance System, 2009-2011

Since there is no clear difference in asthma prevalence among educational attainment levels, only household income is used as an indicator for socioeconomic status (SES) in this report. In addition, income is one of the most direct measures of living standards[9] and is considered to be a suitable indicator of living circumstances.[10] For these reasons, household income as a SES indicator will provide an accurate summary of the impact SES has on adults with asthma in Washington State.

5 Asthma and overall health

Other chronic conditions

Figure 6. Prevalence of other chronic conditions among adults with current asthma by income



Washington Behavioral Risk Factor Surveillance System, 2009-2011. Age - standardized

People with asthma are more likely to report other chronic conditions in addition to respiratory conditions. Asthma, diabetes, cardiovascular disease, and other conditions share several common risk factors that include smoking, obesity, and lack of physical activity. In general, people with any one of these conditions are likely to have or develop a second or third condition.[11] The likelihood of having multiple chronic conditions is higher for people with lower income.

Depression and anxiety are associated with lower adherence to personal healthcare routines and increased illness among patients with chronic diseases. The inability to easily breathe due to asthma may reduce participation in physical, social, and outdoor activities, which could lead to depression.[12]

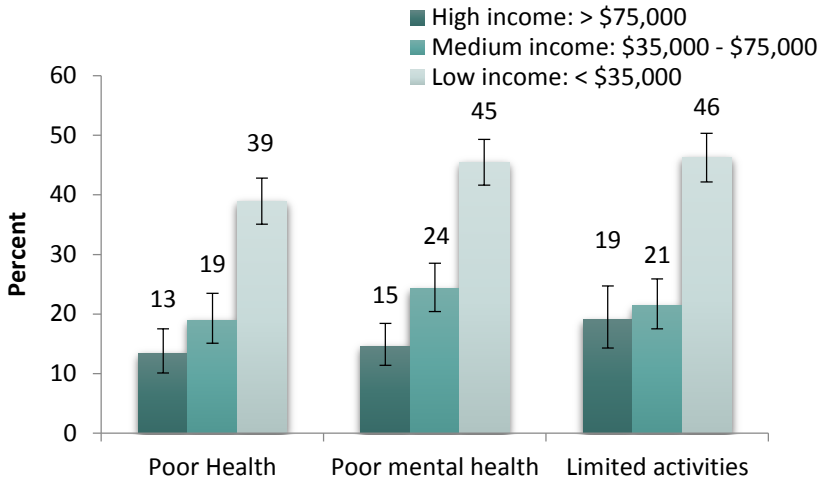
Factors like poor housing conditions, inadequate access to healthcare, and exposure to asthma triggers, all have a role in the development or worsening of asthma. Income level can directly affect a person's ability to avoid some of these asthma risk factors. Economic and neighborhood environments can have an effect on mental health and depression as well.[13] Research also suggests that people with the lowest incomes are more likely to have co-morbidities such as diabetes, hypertension, and depression, when compared to their wealthier counterparts [Figure6].

Health status indicators

Many aspects of the built environment where we live, work, and play, can affect both physical and mental health outcomes. Poor housing conditions are associated with:[14]

- exposure to lead,
- asthma triggers such as mold, moisture, dust mites, and rodents
- mental health stressors like violence and social isolation

Figure 7. Prevalence of Health Status Indicators among adults with current asthma by income

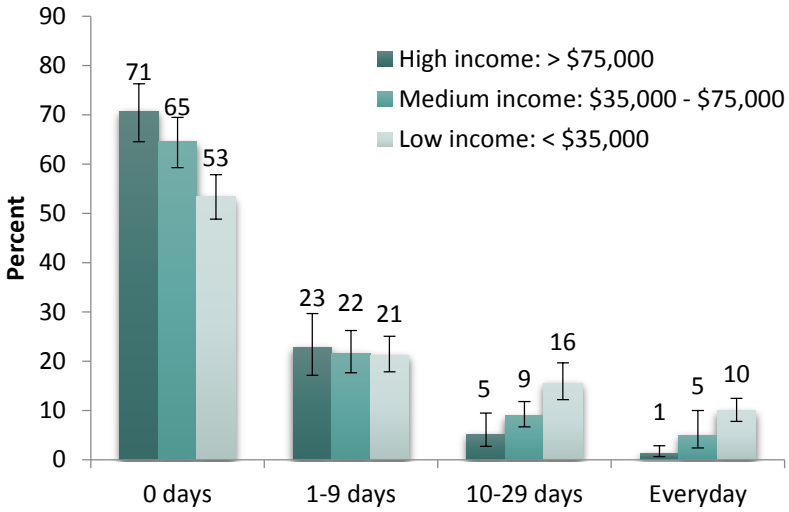


Washington Behavioral Risk Factor Surveillance System, 2009-2011. Age-standardized

Poor mental health indicators including stress, depression, and emotional problems are associated with low-income. Recent studies suggest a possible link between mental health problems and asthma.[15] It is well-documented that people with lower income engage in less physical activity and suffer from poorer health outcomes than the general population.[16] People from households with low-income are much more likely to report having poor health than people with medium or high-incomes [Figure 7]. Those living in low-income households are also more likely to be at risk for health problems related to lack of exercise. People who are in the low-income category are almost twice as likely to have perceived poor mental health when compared to their wealthier counterparts [Figure 7]. Barriers to physical activity for low-income people vary depending on whether they live in urban, suburban, or rural areas, or in places that are predominantly low-income.[16]

Sleep disturbance

Figure 8. Sleep disturbance among adults due to current asthma in the past 30 days by income



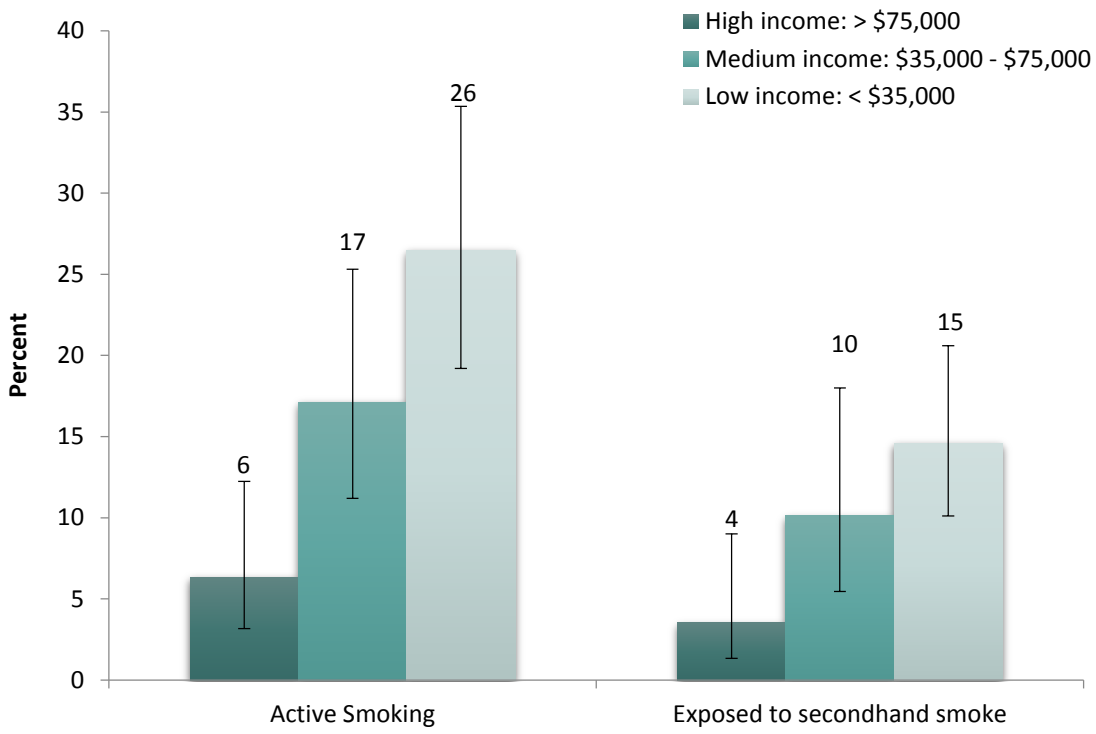
Washington Behavioral Risk Factor Surveillance System, Asthma Call Back Surveys, 2006-2010. Age-standardized

Allergens like pollen or mold that cause allergic reactions, and dust mites that trigger nighttime asthma symptoms, can play a role in sleep problems.[17] Sleep disturbances can impact alertness of the affected persons on the following day.[18] Figure 8 suggests that as income levels increase, the likelihood of disturbed sleep due to asthma decreases. Low-income people are more than three times as likely to report having interrupted sleep everyday due to asthma symptoms when compared to people in the high-income category.

6 Risk Factors

Smoking and secondhand smoke

Figure 9. Prevalence of smoking related risk factors among adults with current asthma by income



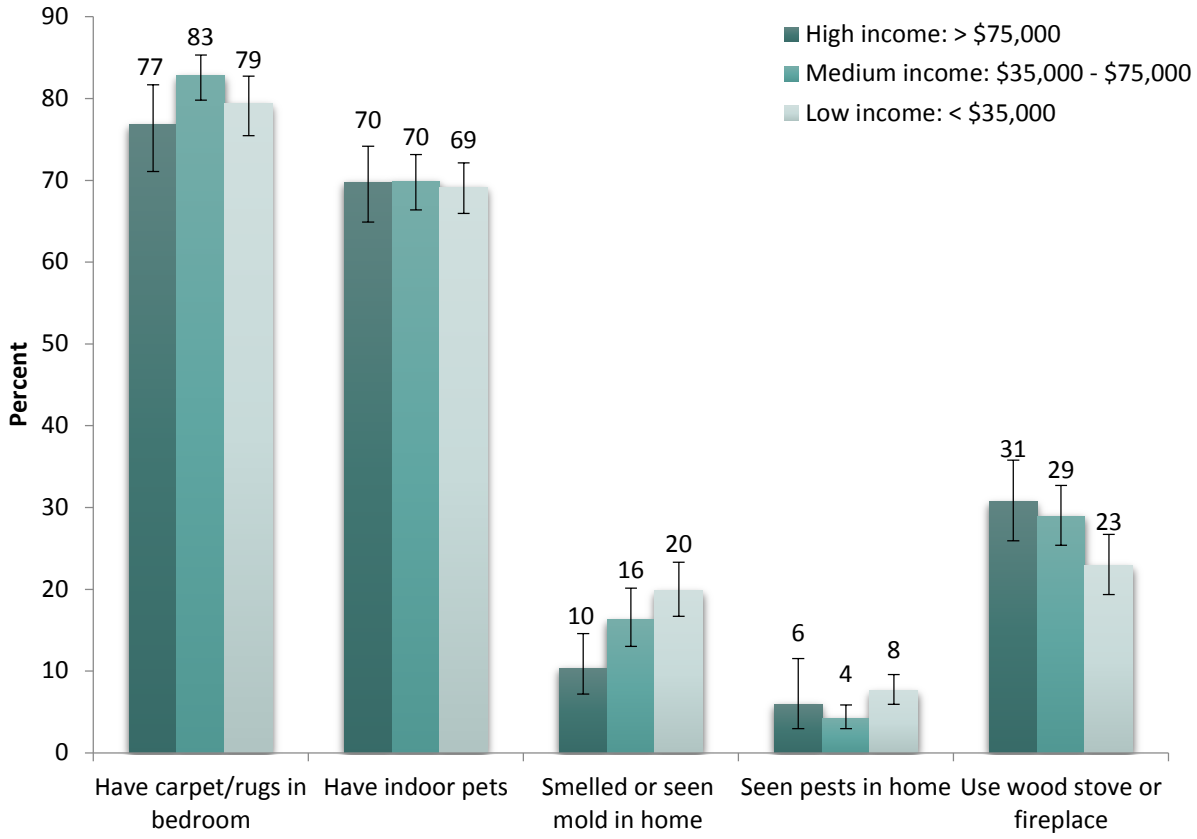
Washington Behavioral Risk Factor Surveillance System, 2009-2011. Age-standardized

Research suggests that lower socioeconomic status (SES) is associated with smoking. More than 25 percent of low-income Washingtonians with asthma are current smokers, compared to just 6 percent of their high-income counterparts [Figure 9]. In addition to socioeconomic factors, smoking can add an increased risk of having poor asthma-related health and quality of life.[19] Exposure to second-hand smoke can increase the frequency of asthma attacks and the severity of asthma. Exposure to second-hand smoke at home is more than three times higher among low-income adults with asthma than those in the high-income category [Figure 9].

Tobacco smoke is not the only factor that can affect asthma episodes. Asthma outcomes are socially patterned. Low SES populations are especially burdened by asthma due to higher exposures to indoor and outdoor asthma triggers such as cockroaches and urban pollution.[19] Low-income communities are more likely to be located in areas with greater exposure to air pollution from traffic, industrial pollution, and other sources.[20]

Indoor risk factors

Figure 10. Presence of environmental triggers in households of adults with current asthma



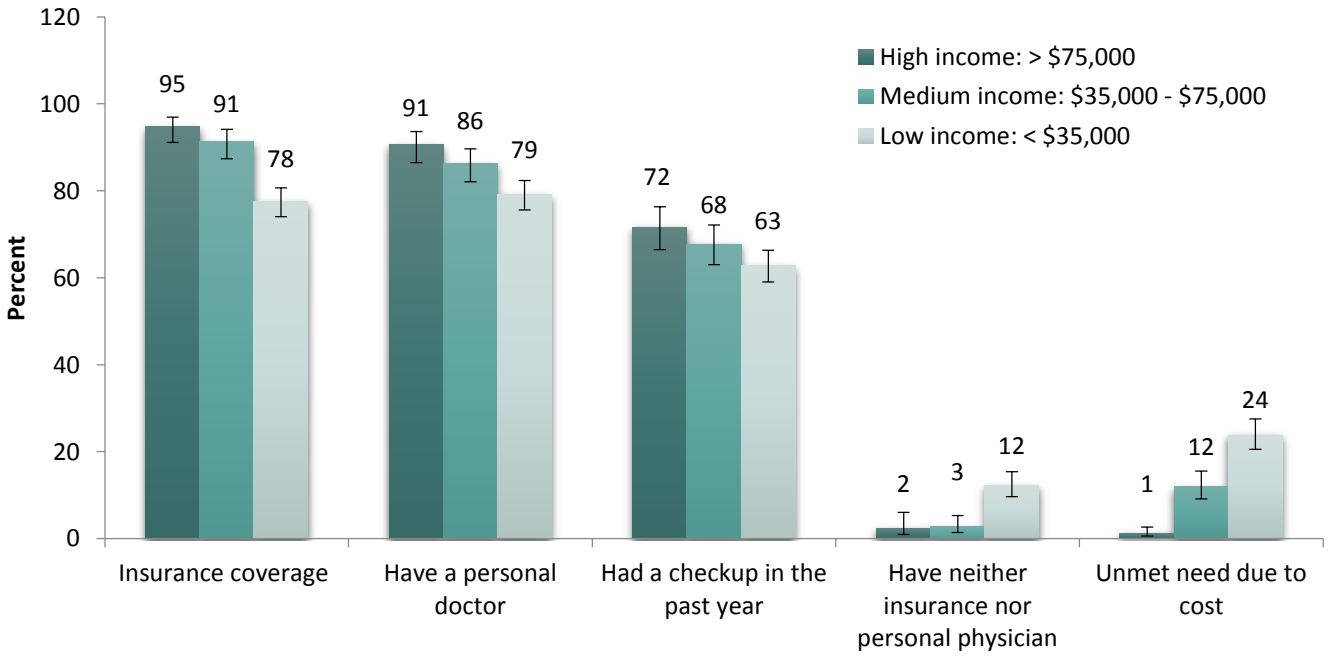
Washington Behavioral Risk Factor Surveillance System, Asthma Call Back Surveys, 2006-2010. Age-standardized

On average, Americans spend up to 90 percent of their time indoors.[21] Many indoor allergens and irritants can play a significant role in worsening asthma symptoms.[21] Studies show that 92 percent of homes contain high concentrations of at least one allergen and 46 percent contain three or more allergens.[22] Most people with asthma live in an indoor environment where they have carpets or rugs in the bedroom and have pets inside the house [Figure 10]. Many people also report using a wood stove or fireplace, and have smelled or seen mold in their home. All of these asthma triggers are consistently present across all income categories. Mold is more common in low-income households. Exposure to indoor allergens from dust mites, cockroaches, dogs, cats, rodents, mold, and fungi are among the most harmful asthma triggers.[23] Substandard housing can often worsen asthma symptoms because of the higher presence of moisture and dampness, pest infestations, poorly maintained heating and ventilation systems, and dirty or deteriorated carpeting.[22] Even if residents are conscientious about keeping their homes clean, triggers will reappear unless underlying factors like fixing the source of water leaks and infestation are addressed.

7 Health Management

Access to healthcare

Figure 11. Access to healthcare among adults with current asthma by income



Washington Behavioral Risk Factor Surveillance System, 2009-2011. Age-standardized

Income and access to quality health care are directly related [Figure 11]. As income increases, access to healthcare also increases. Health insurance can provide access to continuous care that is needed to manage complex chronic diseases like asthma. Continuous health insurance coverage is crucial for monitoring asthma control, receiving timely and appropriate care, and receiving asthma medications.[24] Uninsured people are less likely to seek routine medical care and may postpone or decline to seek treatment for health problems. They might have to make a choice between paying the rent and paying for a medical visit.

Among Washington adults with current asthma, those with low-incomes are less likely to have a routine checkup within the past year. They are more likely to lack continuous health coverage, have no usual source of care, and have unmet healthcare needs due to cost. Some barriers to quality asthma care for low-income residents include: [25]

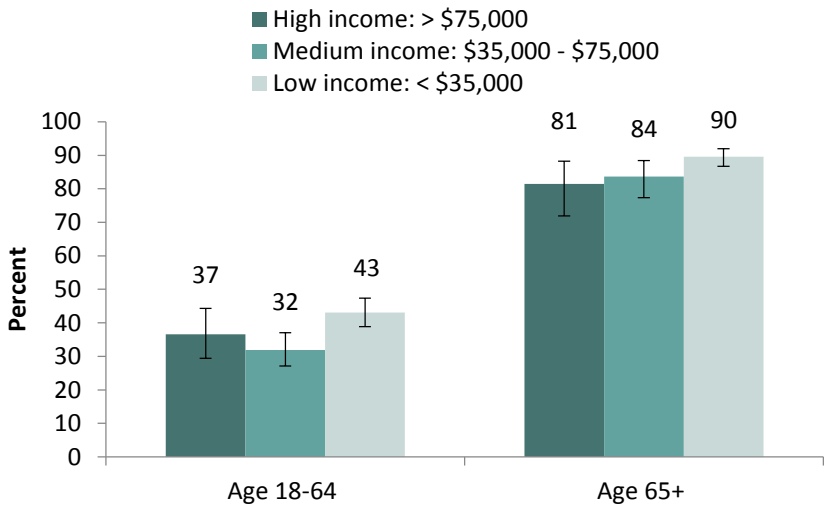
- discontinuous health insurance coverage
- poor physician continuity of care
- family stress
- concerns about medication side effects
- patient/family health beliefs
- communication barriers between providers and patients

Washington adults with asthma in the low-income category were more than 20 times as likely to have unmet needs due to cost compared to their counterparts in the high-income category [Figure 11]. Only 78 percent of people in the low-income category had any form of health coverage whereas 95 percent of adults with asthma in the high income category had some form of health coverage. Low-income Washingtonians were three times as likely to have no insurance or personal physician. Having insurance and a personal physician is a factor that considerably affects continuity and quality of asthma care.

8 Preventive health

Pneumococcal vaccines

Figure 12. Prevalence of pneumococcal vaccines among adults with current asthma by income



Washington Behavioral Risk Factor Surveillance System, 2009-2011

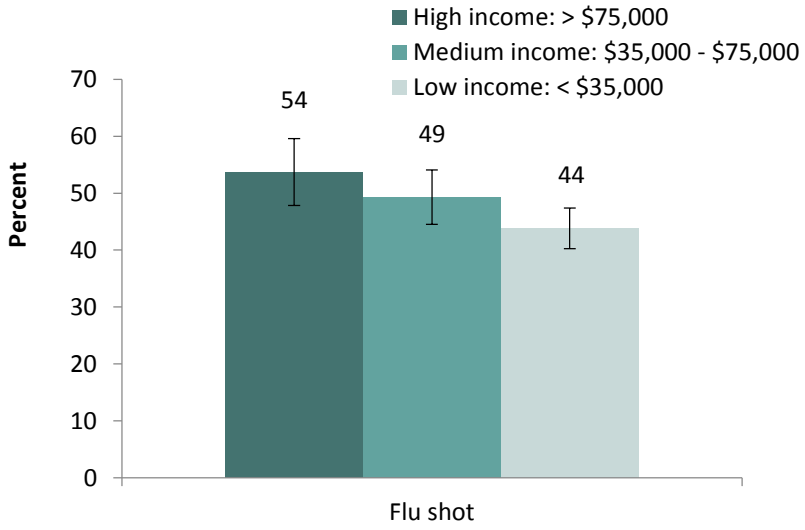
Figure 12 suggests that there is no clear trend for pneumococcal vaccines among adults who are less than 65 years of age with asthma in Washington State. Among seniors (65 or older) with asthma, it seems like those in the low-income category are slightly more likely to receive the recommended pneumonia vaccine when compared to seniors in the high-income category. However, there is no detectable difference between these two income categories. On an average, nearly nine out of ten seniors with asthma get the recommended vaccine in Washington State.

Flu shots

High-income adults with asthma are more likely to get the recommended yearly flu shot than low-income adults with asthma [Figure 13]. Possible explanations for this finding could be the cost associated with these shots or low-income adults having less access to sites or centers that vaccinate.

People in the high-income category may feel they have enough money to get the flu shot every year, while those with a low-income may see it as an expense they cannot afford. Children through age 18 are eligible to receive free vaccines under a federally-funded entitlement program called Vaccines for Children (VFC).[26] No such program exists for adults. Gaps in insurance coverage, coupled with a lack of routine doctor visits have led to lower immunization rates among low-income Americans over the age of 18.[26]

Figure 13. Prevalence of flu vaccine among adults with current asthma by income

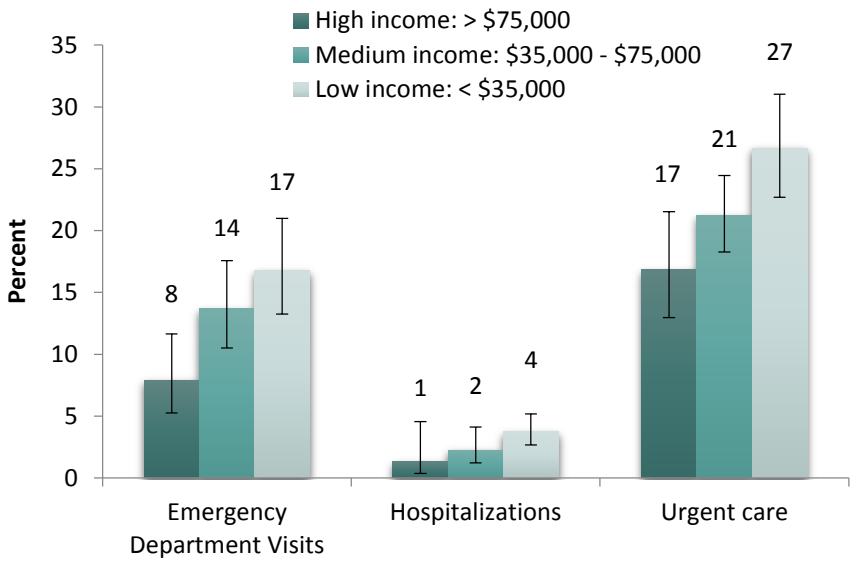


Washington Behavioral Risk Factor Surveillance System, 2009-2011. Age-standardized

Use of health services

With appropriate health care, optimal asthma management and avoidance of asthma triggers, many emergency department and urgent care visits for asthma can be prevented. Twenty-seven percent of low-income adults reported using urgent care facilities at least once in the past year. Only 17 percent of high-income adults with asthma reported the same. Emergency department visit rates are also considerably higher among low-income Washington residents. Hospitalization rates among low-income adults with current asthma were four times higher than rates among high-income adults. Studies show that compared to wealthier and white populations, low-income and non-white populations have higher asthma prevalence and experience more serious impacts such as severe attacks leading to emergency department visits and hospitalizations.[22]

Figure 14. Health services used among adults with current asthma by income

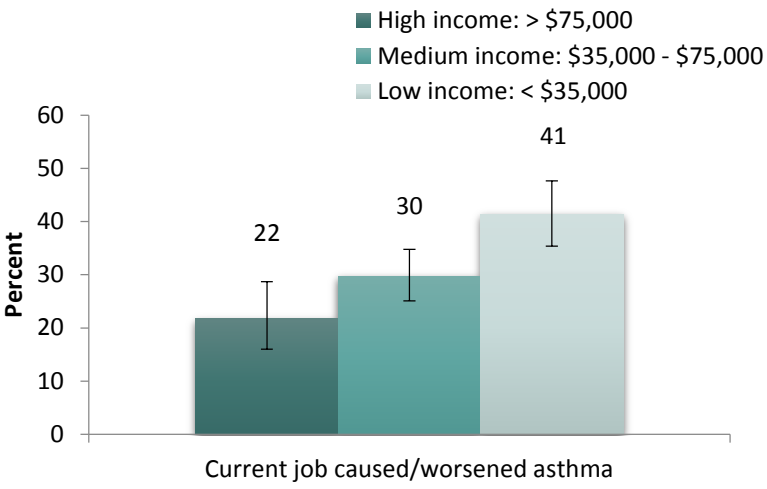


Washington Behavioral Risk Factor Surveillance System, Asthma Call Back Surveys, 2006-2010.
Age-standardized

9 Work-related asthma

Current job caused or worsened asthma

Figure 15. Current job caused/worsened by asthma among adults with current asthma by income



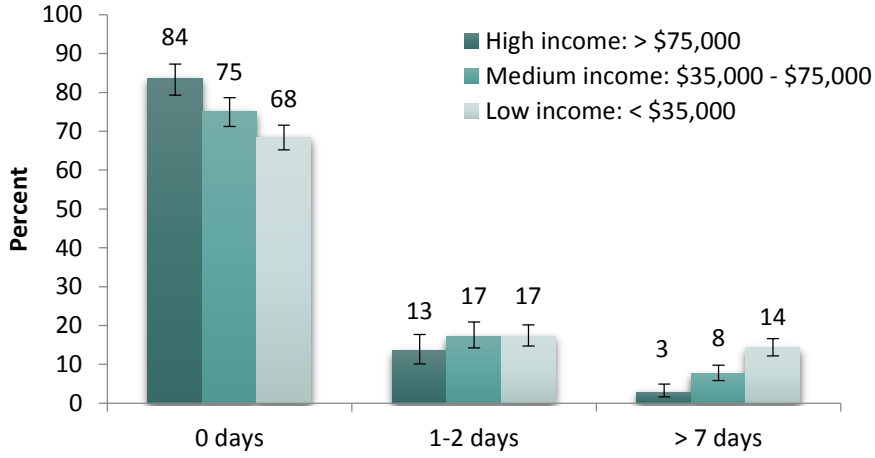
Washington Behavioral Risk Factor Surveillance System, Asthma Call Back Surveys, 2006-2010. Age-standardized

Work-related asthma is caused or made worse by environmental exposures in the workplace. Work-related asthma can cause disability, is potentially preventable, and in some cases is completely curable.[27] In Washington, data show that work-related asthma varies with income and education. People with higher household income and education reported less work-related asthma of any kind.[28] Studies suggest asthma rates are most elevated among low-income populations.[27] Several studies show work-related asthma occurs across a wide variety of industries and occupations. Presence of environmental tobacco smoke is common for these work-related asthma cases.[29] Twenty two percent of adults with asthma in the high-income category reported that their current job caused or worsened their asthma while 41 percent of low-income adults reported the same [Figure 15].

Work days missed due to asthma

Low-income Washingtonians reported missing more days of work in the past year than their wealthier counterparts. When compared to adults in the high-income bracket, nearly five times as many adults with current asthma in the low-income category reported missing more than seven days of work.

Figure 16. Adults with asthma who missed one or more days of work due to current asthma by income

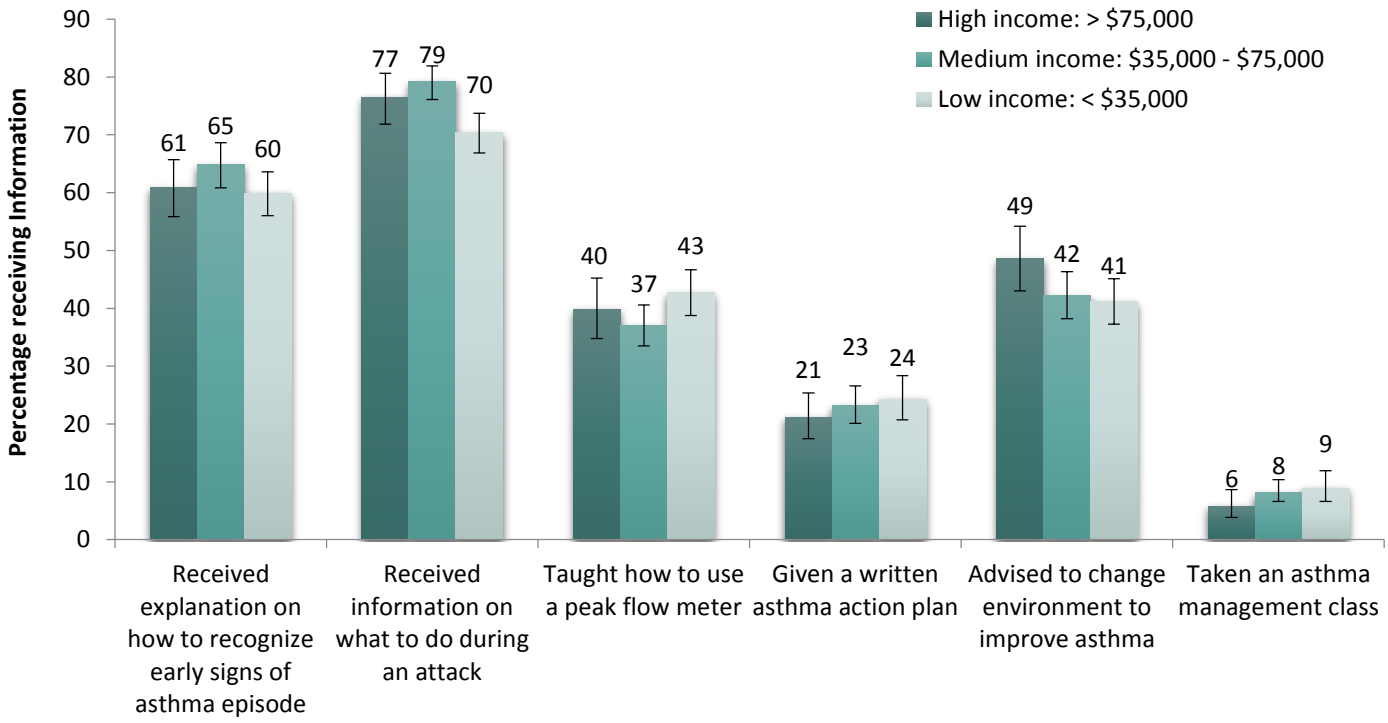


Washington Behavioral Risk Factor Surveillance System, Asthma Call Back Surveys, 2006-2010. Age-standardized

10 Self-management

Asthma education

Figure 17. Distribution of asthma self-management and education among adults with current asthma by income



Washington Behavioral Risk Factor Surveillance System, Asthma Call Back Surveys, 2006-2010. Age-standardized

Individualized, written asthma action plans play a crucial role in helping people with asthma identify and respond to worsening asthma symptoms, reduce exposure to environmental triggers, and use medications properly to control asthma. Since asthma action plans are created for the patient in partnership with the healthcare provider, they can be the foundation for patients to control their asthma. Asthma action plans have been shown to improve patient outcomes by reducing emergency department visits and improving control of asthma symptoms. These individualized plans are a recommended component of quality asthma care. The majority of people in all income categories who have asthma report that they have received training in recognizing early signs of an asthma episode and have received information about what to do during an asthma attack [Figure 17]. However, fewer people report having a written asthma plan. Less than 10 percent of adults with asthma in all income categories reported taking an asthma management class which indicates that asthma education among Washingtonians could be fairly low [Figure 17].

11 Cost of inequity

Asthma inequities by income in Washington State create an unnecessary health burden, both in quality of life, and monetary cost. If the high-income group represents the level of health that should be achieved by all, then an estimated 74,000 excess cases of asthma can be attributed to inequity by income [Table 1]. Similarly, disparities in asthma control and severity account for around 28,000 excess emergency room visits, 32,000 excess urgent care visits, and 7,000 excess hospitalizations per year. These estimates are probably lower than the actual number, because they do not account for multiple visits in a year by the same patient.

Lack of available data in Washington State makes it difficult to precisely estimate actual costs. However, by examining hospital charges in Washington, and emergency department data from Florida[30] where hospital charges are comparable to Washington State, we can make a reasonable estimate of the extent of the financial inequity. In Washington State, the average charge for each hospitalization with asthma listed as the primary diagnosis is $17,322. Total charges for excess asthma hospitalizations are around $118 million per year. The average charge per emergency room visit with asthma listed as the primary diagnosis in Florida was $1,618. If emergency room charges in Washington State are comparable, the total charge for excess emergency department visits is $46 million per year.

Table 1. Excess burden of asthma created by disparities in asthma by income in Washington State

Income	Percent of adults with Asthma	2011 WA State Population age 18+ (OFM, ACS)	Estimated Number of Adults with Asthma	Projected Number of Adults affected*	Excess Cases
< $35,000	13.4	857,333	162,029	93,301	68,728
$35,000 to $74,999	8.0	2,554,620	131,442	125,930	5,512
$75,000 +	7.7	2,345,758	180,605	180,605	0
Total		5,757,712	474,076	399,836	74,240

*Projected number of adults with asthma is based on all adults reporting 7.7 percent regardless of income level. This is the current rate for high-income adults.

12 Recommendations and Interventions

Life disruptions caused by asthma can be avoided if asthma is effectively controlled. Asthma exacerbations and attacks can be prevented through appropriate medical care and disease management. However, low-income Washington adults are less likely to achieve optimal control and management of asthma. They are more likely to miss work, suffer from frequent symptoms, visit the emergency department and/or be hospitalized. These health inequities can be addressed by increasing access to and coordination of care and reducing exposure to asthma triggers. To do this, focus should be on creating or changing policies, environments, and systems of care to better support people with asthma, especially those who are at most risk.[20]

Recommendations:[20, 31]

Improve living environments for Washington residents with asthma

All people with asthma in Washington should live in healthy homes and communities that support effective self-management and reduce exposure to asthma triggers. People in low-income communities are often exposed to environmental asthma triggers. Poor housing conditions and proximity to roadways lead to higher exposure to pollutants that can worsen asthma. Exposure to wood smoke and fine particulate matter is also a threat to many low socioeconomic populations living in Washington. Community-based strategies should focus on changing built environments for those who are most at risk.

Expand health care coverage for low-income Washington residents

All people with asthma deserve quality care that meets national standards. People who have gaps in insurance coverage, or who are unable to pay for asthma medications or care are significantly more likely to have poorly controlled asthma. In addition, ongoing, planned assessment and monitoring, appropriate prescription of medications, control of environmental triggers, and asthma education should be the standard of care for all Washington residents. The implementation of the Affordable Care Act is a step towards achieving this goal.

Assure quality of care for low-income Washington residents

All people with asthma in Washington should have access to, and receive, affordable, high-quality care. Good asthma care is proactive, coordinated, and culturally competent. Providers should work in partnership with patients to help them understand their asthma and learn skills to manage it. Efforts should be made to include a 'health home' approach to primary care. Health homes provide better ways to integrate clinical care with community resources. Patient-centered care in a health home responds to the unique needs, culture, preferences, and values of the patient.

Intervention Strategies:[31]

Policy and environmental changes are needed to support equal access to high-quality care for people with asthma in Washington State, regardless of their income.

Community-based interventions

The community plays an important role in supporting people with asthma by creating and maintaining healthy environments. Healthy communities include healthy worksites, schools and homes, as well as clean outdoor air.

Clinical Care

The 2007 National Asthma Education and Prevention Program (NAEPP) guidelines for the diagnosis and management of asthma identifies four key components of evidence-based asthma care. These include:

1. Assessing and monitoring asthma severity and control
2. Education for partnership in care
3. Use of appropriate medications
4. Control of environmental triggers

13 Conclusion

This report reinforces the reality that asthma disparities exist in asthma prevalence among different racial ethnic groups, level of education, and level of income. The report also highlights the social gradient of health inequalities, where people with lower income have poorer health. Health inequalities arise from a complex interaction of many factors like housing, income, education, and disability. Overall health for low-income Washington residents with asthma is much worse than for high-income residents. This disadvantaged population has poorer mental health, smokes more, is exposed to more secondhand smoke, and lives in communities that are exposed to greater air pollution. Many of the low-income residents with asthma also do not have access to quality health care, and some have neither insurance nor a primary care provider. This segment of the population invariably has a high need to use health services because of limited to no routine healthcare. The cost of health inequality results in productivity losses. The direct cost to the healthcare system increases significantly as well. These asthma inequalities are mostly preventable, and there is a strong economic benefit for addressing them.

Some of the recommendations included in the report are:

- Ongoing, planned assessment and monitoring, appropriate prescriptions of medications, control of environmental triggers, and asthma education should be the standard of care for all Washington residents.
- Providers should work in partnership with patients to help them understand their asthma and learn skills to manage it. Efforts should be made to include a 'Patient Centered Medical/Health Home' approach to primary care.
- Community-based strategies should focus on changing built environments for those who are most at risk.

Asthma treatment will be more successful when Washington residents live in environments that make it easier to breathe and live healthy, active lives.[32] Together, public and private organizations can make changes to help people where they live, learn, work, and play.

14 Appendix

Methods

The Washington State Department of Health gathers data on Washington residents' health and risk behaviors through multiple sources. The Asthma Program compiled data on asthma-related indicators and this report summarizes the surveillance findings using the most recent data available. We generally report the prevalence of asthma, defined as the percentage of people who have the condition at a single point in time. An in-depth discussion of methods used to determine statistical significance is described in The Burden of Asthma in Washington State: 2013 Update (Technical Notes, Appendix C-1).[6]

Adult asthma prevalence is monitored primarily by using the Behavioral Risk Factor Surveillance System (BRFSS), a national state-based survey sponsored by the Centers for Disease Control and Prevention (CDC). To understand the scope of the disease, two survey questions are used to define lifetime asthma and current asthma.

- Lifetime asthma is when the adult or youth has ever been told by a doctor, nurse, or other health professional they have asthma.
- Current asthma is when the adult or youth has ever been told they have asthma AND they still have asthma at the time they took the survey.

For most of the analysis presented here, current asthma is used to describe the burden of the disease. There are many overlapping individual and environmental influences that contribute to asthma. Any reference to differences between groups implies that the differences are statistically detectable unless otherwise stated. We used the following conventions to describe population subgroups:

- All Adults – defined as non-institutionalized adults who reside in Washington State and do not live in group quarters (i.e., nursing homes, military barracks, hospitals, correctional facilities, etc.).
- Adults– adults are age 18 or older.

Small population sizes and limited resources for data gathering make it difficult to accurately identify asthma rates and related indicators among American Indian/Alaska Native (AI/AN). In general, there are gaps in information for some racial and ethnic minorities living in Washington. Gaps can relate to insufficient data to produce reliable estimates or, when estimates are possible, inadequate power to detect differences between groups. This can limit our ability to identify the current state of disparities for some groups. To provide sufficient sample size for analysis we combined 2009-2011 BRFSS and 2006-2010 BRFSS Asthma Callback Survey data for the adult population.

Charges are the total undiscounted amount that a facility bills for all care and services provided. Charges differ both from costs, and from the amount received by a hospital for services provided. Determination of costs requires additional special analyses of resource consumption and likely varies by hospital. In addition, hospital costs and payments received may reflect provider price shifting and other factors (such as negotiated discounts, bad debt, and charitable care) and are often lower than charges.

American Indian/Alaska Native (AI/AN) populations encompass numerous tribal nations. Grouping all AI/AN into a single category may mask differences among subgroups. The data describes asthma for the overall AI/AN population in Washington and may not reflect differences among diverse subgroups in this population.

Data Sources

Behavioral Risk Factor Surveillance System

The Behavioral Risk Factor Surveillance System (BRFSS) is a statewide random-digit-dialing telephone survey coordinated by the Centers for Disease Control & Prevention (CDC) and conducted in all 50 states. Interviews were conducted on a monthly basis throughout the year. For this report, responses were combined by calendar year, and weighted to be representative of the adult population of Washington. Adult asthma prevalence was based on whether a respondent reported current asthma.

BRFSS, Asthma Callback Surveys (ACBS)

The ACBS is an in-depth asthma survey conducted approximately two weeks after the Behavioral Risk Factor Surveillance Survey (BRFSS). BRFSS respondents who report ever being diagnosed with asthma are eligible for the asthma callback. The ACBS addresses critical questions surrounding the health and experiences of persons with asthma. Through the callback, the Washington Asthma Program collects detailed information on topics such as healthcare utilization, knowledge of asthma, asthma management, asthma medications, environmental factors, costs, co-morbid conditions, work related asthma, and complementary and alternative medicines. Learn more at: www.cdc.gov/asthma/ACBS.htm

Asthma Hospitalization (Charges)

Asthma hospitalization charges were obtained through the DOH Comprehensive Hospital Abstract Reporting System (CHARS). CHARS include data from all inpatient stays for all patients treated in state-licensed acute care hospitals in Washington. CHARS does not include

hospitalizations in U.S. military hospitals, U.S. veterans'' administration hospitals, or Washington State psychiatric hospitals. The first diagnosis field is considered to be the principal reason the patient was admitted to the hospital.
For further information on CHARS, please refer to:
Washington State Department of Health, Center for Health Statistics, Hospital Data:
http://www.doh.wa.gov/ehsphl/hospdata/

Technical Notes

BRFSS 2009-2011

Beginning in 2011, BRFSS adopted a new weighting methodology, and began including data from cell phone respondents. The changes should result in estimates of health and health behaviors that more accurately represent the Washington State population. Due to these changes, health estimates from 2011 and beyond cannot be compared directly to those from 2010 and earlier. In anticipation of the change, Washington State collected a limited sample of cell phone data in 2009 and 2010. Washington State Center for Health Statistics created weights for 2009 and 2010 BRFSS using the new methodology. This enables the Department combine 2009, 2010, and 2011 BRFSS for analysis of health disparities. For more information, refer to this document.

Hospitalization charges

Hospital charge data are from the DOH Comprehensive Hospital Abstract Reporting System (CHARS). Charges are the total undiscounted amount that a facility bills for all care and services provided. Charges differ both from costs, and from the amount received by a hospital for services provided. Determination of costs requires additional special analyses of resource consumption and likely varies by hospital. In addition, hospital costs and payments received may reflect provider price shifting and other factors (such as negotiated discounts, bad debt, and charitable care) and are often lower than charges.

Issues related to reported race/ethnicity

The determination of race when more than one race is reported follows decision rules established by the National Center for Health Statistics. In most cases, the first race given is assigned as the person's race

Reporting of race/Hispanic origin on death certificates is sometimes based on observing the decedent rather than questioning the next of kin. This procedure causes an underestimate of deaths for certain groups, particularly Native Americans, some of the Asian subgroups, and Hispanics. Thus, death rates based on death certificate data are lower than true death rates for these groups. Learn more at:
http://www.doh.wa.gov/DataandStatisticalReports/VitalStatisticsData/DeathData.aspx

Glossary

Health disparity: Differences in health status among distinct segments of the population including differences that occur by gender, race or ethnicity, education or income, disability, or living in various geographic localities.

Health inequity: Disparities in health (or health care) that are systemic and avoidable and, therefore, considered unfair or unjust.

Age-adjustment – A method to standardize populations with different age distributions and allows for comparisons over time; also known as age-standardization. This is particularly important for age-related diseases. Unless otherwise indicated, all age-adjusted rates in this document have been adjusted to the 2000 U.S. standard population.

Confidence interval (CI) – An indication of a measurement's precision with a narrow confidence interval indicating high precision and a wide confidence interval indicating low precision. This is sometimes called the "margin of error."

Current asthma – When a survey respondent reports that they have ever been told they have asthma AND they still have asthma at the time they took the survey.

Federal Poverty Level (FPL) – A general term which refers to the federal poverty guidelines, an income level based on the number of people in a family unit. The poverty threshold is calculated annually by the Health and Human Services for administrative purposes, such as determining financial eligibility for federal programs. In this report FPL is defined as people who are above 200 percent FPL, 100-200 percent FPL (near poor), or below FPL (poor).

Lifetime asthma – When survey respondents report they have ever been told by a doctor, nurse, or other health professional they have asthma.

Prevalence – The percentage of a defined population with a disease at a given time.

Risk factor – A personal habit or characteristic, clinical condition, or environmental exposure that is associated with an increased probability or severity of disease.

Secondhand smoke exposure – Inhalation of air containing tobacco smoke from someone else smoking. Also known as environmental tobacco smoke.

Adult – smoking occurring in the home in the past 30 days.

Adult Call back –smoking inside the home in the past 7 days.

Statistically detectable – An observed difference between two populations is determined to be statistically detectable (significant) if it is unlikely to have occurred randomly or by chance. If there is more than a 5 percent probability that the differences we see are due to chance, we say that there is no statistically detectable (or significant) difference.

Surveillance – The ongoing systematic collection, analysis, and interpretation of health data. Surveillance is essential to the planning, implementation, and evaluation of public health practice.

Tobacco use – Adults that ever smoked at least 100 cigarettes in their lifetime and currently smoke every day or someday; Youth that smoked a cigarette in the past 30 days

Trigger – A risk factor that causes exacerbations of asthma. Triggers are secondhand smoke, exercise, mold, pet dander, etc.

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