Asthma

Definition: Asthma is a chronic inflammatory disease of the airways characterized by airflow obstruction and airway hyper-responsiveness. Clinical symptoms include wheezing and shortness of breath. This chapter defines "current asthma" as adults who report on the Behavioral Risk Factor Surveillance System (BRFSS) that a doctor or other health professional told them that they had asthma and that they still have asthma. Children with asthma are children whose parents or guardians report on BRFSS that a doctor or other health professional told them that their child had asthma and that the child still has asthma. Asthma hospitalizations have the first diagnosis at discharge coded as ICD-9-CM 493; asthma deaths have the underlying cause of death coded as ICD-10 J45-J46.

Summary

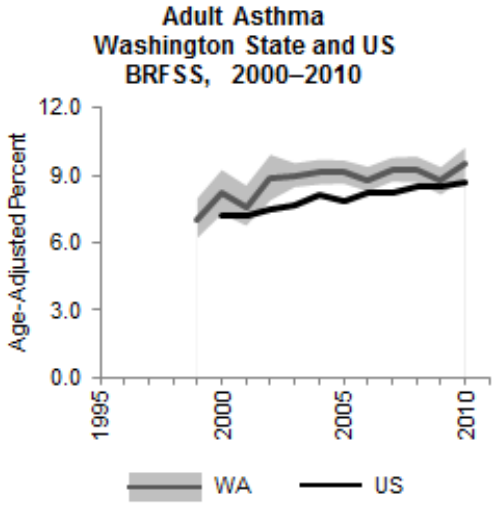
Washington State's asthma rate is higher than the national average. The 2010 Behavioral Risk Factor Surveillance System (BRFSS) survey showed that 9.6% (±0.7%, age-adjusted) of Washington adults had asthma compared to 8.7% (±0.2%, age-adjusted) nationally. There was no difference between the age-adjusted and crude rates in Washington. In Washington State and nationally, women are more likely to have asthma than men. Asthma rates increase as income decreases. Washington BRFSS data for 2008–2010 showed American Indian or Alaska Native adults having the highest asthma rates and adults of Asian or Hispanic origin having the lowest.

The public health approach to asthma requires improving indoor and outdoor air quality, providing community health education, removing asthma triggers in the home and workplace, and assuring high quality medical care. People with asthma must have an understanding of the disease process, and the skills and resources to follow their asthma care plans.

Time Trends

In 2010, the age-adjusted rate of Washington adults with asthma was 9.6% (±0.7%). Washington's adult asthma rate was higher than the U.S. rate of 8.7% (±0.2%). Asthma rates have increased nearly 40% since 1999, from 7.0% (±0.9%) to 9.6% (±0.7%). The U.S. adult asthma rates have also increased steadily, from 7.2% (±0.2%) in 2000 to 8.7% (±0.2%) in 2010.

Parental reports in 2009–2010 Behavioral Risk Factor Surveillance System (BRFSS) data combined showed 6.7% (±0.6%) of children younger than 18 in Washington with current asthma. There are not sufficient data to look at trends for children in Washington. Washington's childhood asthma rate is lower than the national average of 8.4 (±0.2%).[1]



2020 Goals

Healthy People 2010 and *2020* have national targets for reducing age-adjusted asthma hospitalization rates for children younger than five, children and adults ages 5–64, and adults ages 65 and older.

The following table shows Washington's age-adjusted 2009 asthma hospitalization rates and the *Healthy People* targets. Washington exceeded the *Healthy People 2010* targets for all age groups and the *2020* targets for the two older groups. As with other *Healthy People 2020* targets, the targets for asthma hospitalizations for the two older groups in *Healthy People 2020* are less ambitious than those in *Healthy People 2010.*

Hospitalization Rates for Asthma per 100,000 Population

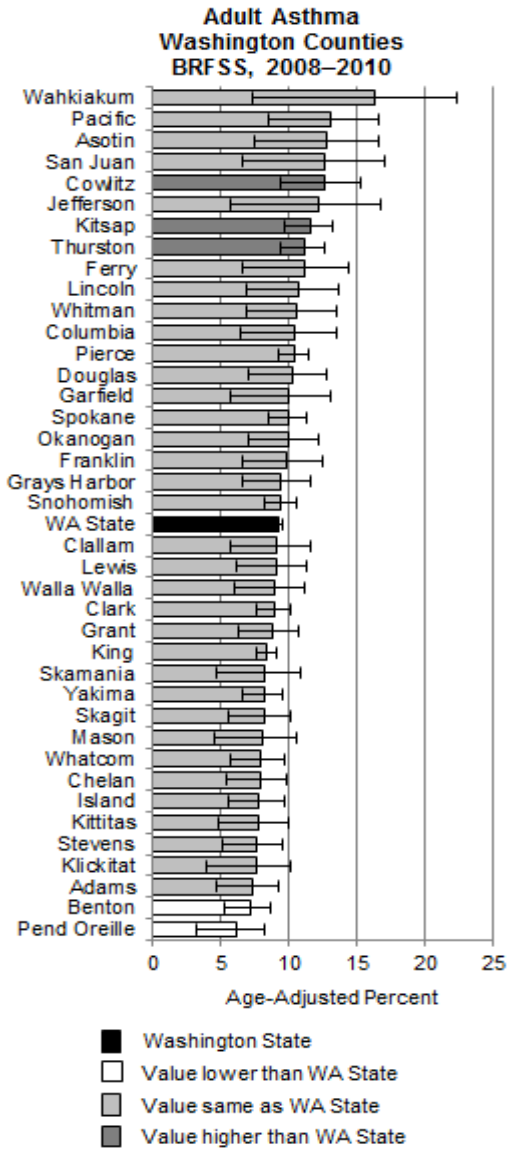
Age Group	Washington 2009	U.S. Target 2010	U.S. Target 2020
Children younger than 5 years	215	250	181
Children/adults ages 5–64 years	60	77	86
Adults ages 65 and older	108	110	203

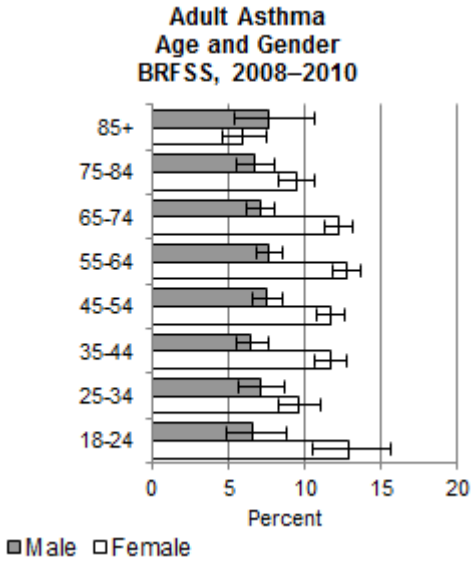
Geographic Variation

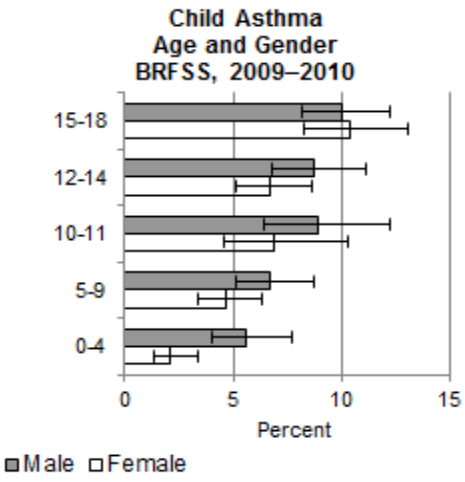
In 2008–2010 combined BRFSS data, the age-adjusted county-level rates for current asthma ranged from about 6% to 16%. Benton and Pend Oreille counties had rates below the state average; Cowlitz, Kitsap and Thurston counties had higher asthma rates.

Age and Gender

Consistent with national patterns, in Washington asthma is more common in women than men across age groups from 18 to 84 years. Washington data on children are also consistent with national patterns. Washington BRFSS data from 2009–2010 combined showed that boys (7.7% ± 0.9%) were more likely to have asthma than girls (5.7% ± 0.8%). The gender reversal from childhood to adults is not well understood, despite having been widely noted.[2,3,4]



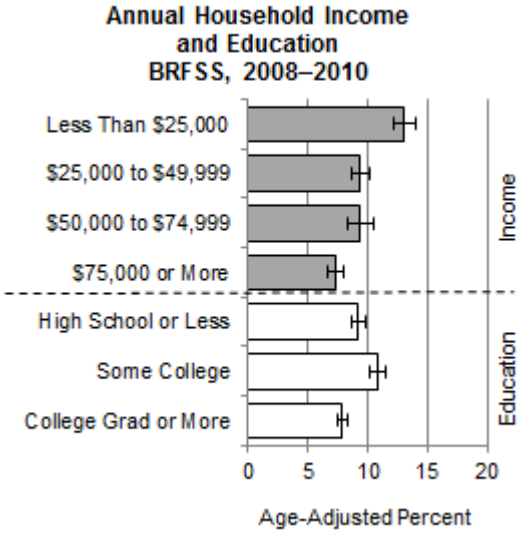




Economic Factors and Education

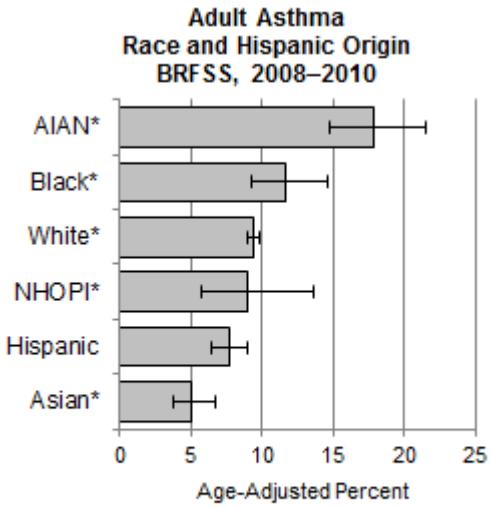
Washington 2008–2010 BRFSS data combined showed a strong association between household income and reporting current asthma. As income increased, the percentage of adults reporting current asthma decreased. People with incomes less than $25,000 per year were nearly twice as likely to report asthma as people with incomes of $75,000 per year or more. This association persisted after accounting for gender, education, race and Hispanic origin.

People who had completed four years of college were less likely to report current asthma than people with less education. The relationship between asthma and education level did not persist after accounting for gender, income, race and Hispanic origin.



Race and Hispanic Origin

Washington BRFSS data for 2008–2010 combined showed rates of current asthma as highest among American Indians or Alaskan Natives and lowest for Asians. Washington adults of Hispanic origin also reported relatively low rates. This persisted even when gender, education and income were taken into account. These patterns are consistent with national data,[3] Although some reports characterize asthma rates among Hispanics as being high, these reports focus on Hispanics of Puerto Rican origin.[3,4] Most Hispanics in Washington are of Mexican or Central American heritage.



* Non-Hispanic
AIAN: American Indian/Alaska Native
NHOPI: Native Hawaiian/Other Pacific Islander

Other Measures of Impact and Burden

Hospitalizations. Proper asthma care and management can prevent many hospitalizations.[5] Thus, information on asthma hospitalizations can aid in identifying groups of people needing better care or help with managing their asthma. In 2010 almost 4,900 hospitalizations of Washington residents listed asthma as the main reason for the hospitalization. This includes Washington residents hospitalized in Washington or Oregon. The hospitalization rate in 2010 was 73 per 100,000. Children younger than five were the most likely to be hospitalized for asthma, with boys more likely to be hospitalized than girls. People ages 15–24 were least likely to be hospitalized with asthma as the main reason for the hospitalization. Washington hospitalization data do not include information on race, ethnicity or income. Studies in other states have shown hospitalizations to be higher among blacks and people of Hispanic origin compared to whites,[6,7] and among people with low incomes compared to people with higher incomes.[8] These patterns are likely to be true in Washington as well.

Workers' compensation claims. Work-related exposures cause up to 20% of adult asthma cases.[9] In Washington for 2005–2009, an average of 110 workers per year filed workers' compensation claims for work-related asthma. The rate of asthma-related claims in 2009 was 60 per million full-time equivalent employees.[10] Research has shown that workers' compensation claims data likely underestimate the true burden of work-related disease.[11]

Deaths. Since 2000, an average of 80 Washington residents have died from asthma each year. In 2010, Washington's asthma death rate was 1.1 per 100,000, which is similar to the national rate.[12] Adults ages 85 and older had the highest asthma death rate, 19 per 100,000.

Risk and Protective Factors

In addition to genetic predisposition, multiple modifiable factors can increase the risk of developing asthma and exacerbating symptoms. These include poor access to healthcare and social support; exposure to tobacco smoke and outdoor and indoor air pollutants; and individual risk factors, such as allergies and obesity. Many of the same risk factors that increase the likelihood of asthma are also related to more severe symptoms among people with asthma.

Access to healthcare and social support. People who lack access to quality healthcare, financial resources to obtain medication, and social support to manage the disease effectively are more likely to have poorly controlled asthma.[13] Many patients experience barriers to receiving appropriate care. Based on the 2006–2009 BRFSS Asthma Callback Surveys, 8% (±1.5) Washington adults with asthma reported being unable to see their healthcare provider due to cost; 14% (±2.6) reported being unable to get their asthma medications due to cost.

Tobacco smoke. Children whose parents smoke are much more likely to get asthma than children of nonsmokers.[14] Smoking and exposure to secondhand smoke are also probable causes of new asthma cases among adolescents and adults who smoke.[15] Prenatal exposure to tobacco smoke has been associated with development of asthma in children[16] and decreased responsiveness to asthma medication compared to children with asthma who did not have prenatal smoking exposures.[17]

Based on 2008–2010 BRFSS data combined, adults who reported smoking every day or just on some days had the highest asthma prevalence (11.1% ±1.0%), former smokers somewhat less (9.3% ±0.8%), and those who have never smoked had the lowest (8.4% ±0.4%).

Outdoor air pollution and irritants. Exposure to outdoor air pollutants, such as ozone and diesel exhaust, can trigger asthma attacks. People who live near major highways have higher rates of asthma-related emergency department use and hospitalizations than people who do not.[18]

Indoor air pollution. Exposure to allergens and other indoor particles can contribute to asthma symptoms and attacks. Asthma triggers that can be found in the home include dust mites in carpets or bedding, gas and wood-burning appliances, pet dander, pests such as cockroaches and rodents, and mold. Based on 2006–2009 BRFSS Asthma Callback Surveys, 79% (±3%) of Washingtonians with asthma lived in homes with carpets or rugs and 69% (±3%) allowed pets inside. On the same surveys, 28% (±1%) of adults with asthma used a wood-burning stove or fireplace, 21% (±1%) used gas for cooking, and 11% (±1%) reported exposure to secondhand smoke inside the home.

Many allergens and irritants in the workplace cause or aggravate asthma. About 15–20% of all adult-onset asthma is thought to be caused by workplace exposures.[9]

Individual risk factors. Physical exercise can increase symptoms in some people who have asthma. This is especially likely when outdoor air quality is poor.

Obesity is associated with increased risk of asthma. In Washington this is most apparent for women. Based on the 2008–2010 BRFSS data combined, obese women had the highest asthma rates (18.5% ±1.4%), overweight women had intermediate rates (11.2% ±1.0%), and women who were not overweight had the lowest rates (7.8% ±0.7%). Asthma prevalence for obese men (8.4% ±1.0%) was higher than for both overweight men (6.6 ±0.8%) and men who were not overweight or obese (6.2% ±0.8%).

Children with allergies are more likely to develop asthma than those without allergies.[19,20] Viral respiratory infections in children frequently trigger asthma exacerbations.[21,22]

Intervention Strategies

Public health asthma programs have historically been funded to focus on reducing symptoms and preventing asthma attacks. Some of these activities might also reduce development of asthma. People with asthma need healthy places to live, learn, work and play. They need access to high-quality care and the skills to manage this chronic condition. Policy and environmental changes are needed to support this reality.

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.

Home visits for children and adolescents with asthma have been shown to reduce symptoms and lower emergency healthcare use.[23] There are insufficient data to recommend these services for adults. Home visits include environmental assessment and asthma self-management education. Visits should address triggers in the home and provide supplies (like HEPA-filtered vacuum cleaners, mattress covers and green cleaning products) to reduce exposures. Such interventions have been successful in urban and rural Washington State.[24,25,26]

About 15% of adult asthma can be linked to exposures in the workplace. Employers using known asthma-causing agents, such as Western red cedar and collision automotive repair chemicals, should minimize worker exposure by removing or isolating the substance from the workplace. Other options to reduce exposure in the workplace include worker training and use of personal protective equipment such as respirators.

School-based programs that focus on recognition of asthma symptoms have been effective in reducing absences and improving asthma control.[27,28] Comprehensive programs that require system changes and improved staff and student education—although not yet fully evaluated—show promise in creating better support for students and families struggling with asthma management. The Centers for Disease Control and Prevention provides recommendations for schools in their document "Strategies for Addressing Asthma within a Coordinated School Health Program."[29]

Ozone, diesel exhaust and small particulate matter are major asthma triggers in outdoor air. Policy changes that support reduction of outdoor air pollution would protect everyone's health, but are especially important for those with asthma. In addition, these measures would benefit people with lung and heart conditions, children and the elderly.[30,31]

Clinical care. The National Asthma Education and Prevention Program (NAEPP) publishes guidelines for the diagnosis and management of asthma.[32] The 2007 guidelines identify four key components of evidence-based asthma care.

1) Assessing and monitoring asthma severity and control: Asthma patients receive checkups every one to six months to monitor symptom control. The evaluation should include lung function testing (spirometry).
2) Education for a partnership in care: Asthma education should be provided and reinforced in clinics, pharmacies, schools and the home. Asthma education should be reimbursed as an integral part of effective asthma care.
3) Use of appropriate medications: Everyone with persistent and not well-controlled asthma should take a daily controller medication, preferably inhaled corticosteroids, to treat the underlying inflammation of asthma.
4) Control of environmental triggers: Healthcare providers should also assess asthma patients for exposure to environmental triggers.

Improving clinical practice. Strategies to increase standard use of the NAEPP guidelines include multifaceted, interactive provider education and system improvements such as registries, prompts and provider feedback. The patient-centered medical home model can facilitate a timely and coordinated approach to primary care and referral, and implementation of NAEPP guidelines. This model has shown promise in improving asthma care and outcomes for those with asthma.[33,34]

See Related Chapters: Tobacco Use, Indoor Air Quality, Outdoor Air Quality, and Access to Primary Healthcare Services

Data Sources (For additional detail, see Appendix B)

Washington State Behavioral Risk Factor Surveillance System (BRFSS): 1987-2010. Olympia, Washington: Washington State Department of Health, under federal cooperative agreement numbers: U58/CCU002118 (1987-2003), U58/CCU022819 (2004-2008), and U58/DP001996 (2009-2010); data prepared by Office of Healthy Communities.

Washington State Behavioral Risk Factor Surveillance System Asthma Callback Survey, 2006-2009; data prepared by Office of Healthy Communities.

Washington State Death Certificate: Washington State Department of Health, Vital Registration System Annual Statistical Files, Deaths 1980–2010, released August 2011; data prepared by Office of Healthy Communities.

Population Counts: Washington State Office of Financial Management, Forecasting Division (OFM), census and intercensal estimates (2000–2010), released December, 2011

Washington Hospitalization Data: Comprehensive Hospitalization Abstract Reporting System (CHARS) 1987–2011, Washington State Department of Health, Center for Health Statistics, July 2012; ; data prepared by Washington State Department of Health, Office of Healthy Communities.

Oregon Hospitalization Data: Nationwide Inpatient Sample (NIS), Healthcare Cost and Utilization Project (HCUP), Agency for Healthcare Research and Quality; data prepared by Washington State Department of Health, Office of Healthy Communities.

Washington workers compensation claims rates: Washington State Department of Labor and Industries—Labor and Industries Industrial State Fund (SF) System (2009)

For More Information

Washington State Department of Health Asthma Program, (360) 236-3631

http://www.doh.wa.gov/YouandYourFamily/IllnessandDisease/Asthma.aspx

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Endnotes

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