

Work-related Asthma: Exposure Risk and Prevention

Study Provides First State Comparisons by Occupation and Industry

This WorkCare Fact Sheet discusses causes of work-related asthma, prevalence and how to reduce exposure risk.

Employees in a variety of industries and occupations are at risk of developing work-related asthma.

Asthma is a potentially disabling lung disease characterized by difficulty breathing. Symptoms include chest tightness, wheezing, cough and shortness of breath. Asthma is considered to be related to work when it is caused or exacerbated by exposure to certain substances in the workplace.

Exposure Agents

Workplace exposure agents include irritant chemicals, dust, mold, animals and plants. Secondhand smoke, emotional stress, temperature extremes and physical exertion are also associated with new-onset and work-exacerbated asthma.

Exposure to a triggering agent can occur by inhalation or through skin contact. Asthma symptoms may start at work or within several hours after leaving work. In some cases an exposure pattern is not clearly evident, making it challenging to identify a work-related cause.

Asthma Prevalence

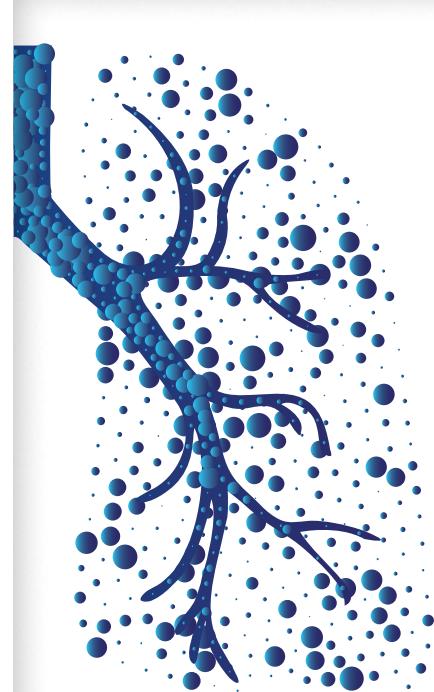
An estimated 1 in 12 people in the general U.S. population have asthma.

While the actual number is undetermined, asthma may be related to work in up to 48 percent of current asthma cases and could potentially be prevented, according to a 2006-2007 national Behavioral Risk Factor Surveillance System (BRFSS) survey of working adults in 33 states.

Meanwhile, a Centers for Disease Control and Prevention (CDC) study that features the first state-specific estimates of workers with current asthma by industry and occupation found an overall 7.7 percent prevalence rate. Based on that rate, researchers estimate as many as 2.7 million U.S. workers might have asthma caused or exacerbated by workplace conditions. (Refer to *Asthma Among Employed Adults, by Industry and Occupation — 21 States, 2013; Morbidity and Mortality Weekly Report*, Vol. 65, No. 47.)

The 7.7 percent prevalence rate is based on a BRFSS survey of 107,327 working adults in 21 states. The study subjects completed an industry and occupation module and also participated in an asthma call-back survey in 2013.

Industries with the highest current asthma prevalence were health care and social assistance (identified in 20 of the 21 states), retail trade (16 states) and education (14 states). Among occupations with the highest current asthma prevalence, office and administrative support was identified in 16 of the 21



states, health care practitioners and technical in 15 states, and sales and related occupations in 13 states. Among at-risk professions, it is well recognized that workers in the health care and social assistance industry who are exposed to cleaning and disinfection products, powdered latex gloves and aerosolized medications have a twofold increased likelihood of new-onset asthma.

The proportion of workers with current asthma differed significantly by age, sex, race/ethnicity, household income and state, the survey found. Prevalence of current asthma among workers ranged from 5 percent in Mississippi to 10 percent in Michigan. Industry- and occupation-specific prevalence of current asthma was highest among workers in the information industry (18 percent) in Massachusetts and in health care support occupations (21.5 percent) in Michigan.

State variations are attributed, at least in part, to factors including:

- Composition of working populations (e.g., age, race/ethnicity and education)
- Socioeconomic conditions
- Health insurance coverage
- State-specific laws
- Geographic differences in prevalence of sensitization to aeroallergens
- Risk for exposure to certain agents

Related Regulations

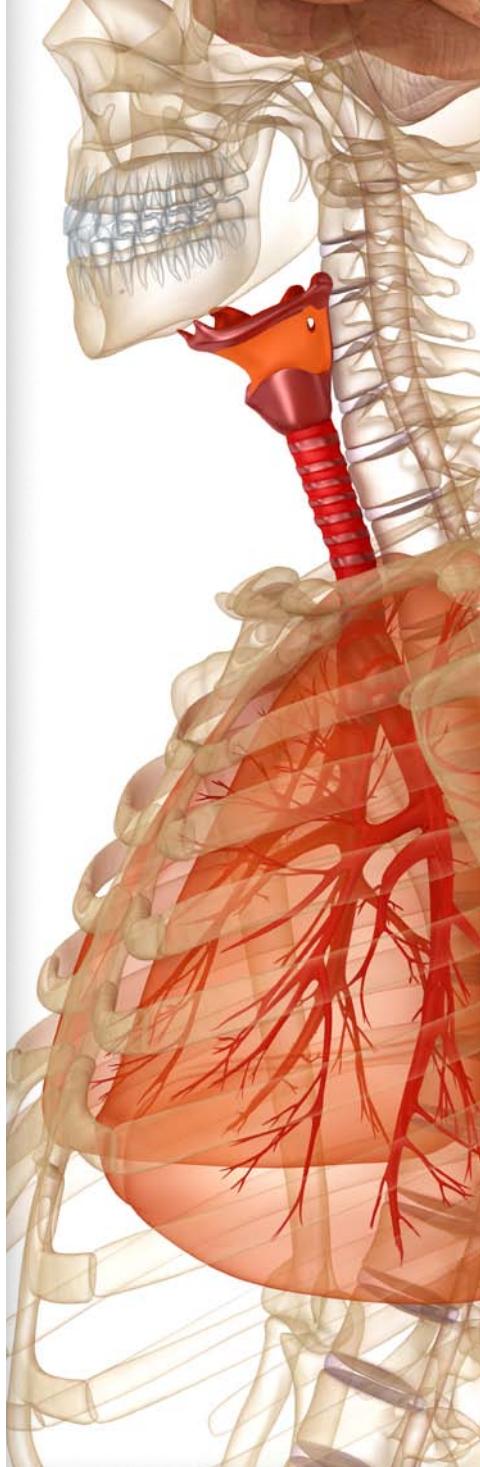
Work-related asthma is addressed in Occupational Safety and Health Administration (OSHA) standards for recording and reporting occupational injuries and illnesses. Applicable OSHA general industry requirements include those related to personal protective equipment, respiratory protection, and toxic and hazardous substances. There is also related indoor air quality guidance. For details, refer to OSHA's [Occupational Asthma](#) resource page.

When a case of work-related asthma is confirmed by a medical professional, the employee is entitled to compensation under the workers' compensation system in the applicable jurisdiction.

Diagnosis and Treatment

To diagnose asthma, a primary care physician will evaluate symptoms, gather a complete health history, conduct a physical exam and review test results.

In making a causation determination, an evaluating occupational medicine physician may consider factors such as: 1) presenting symptoms; 2) circumstances surrounding illness onset and course of the illness; 3) medical history, including risk for airways disease; 4) occupational and environmental exposure history; 5) physical examination and diagnostic test findings (e.g., spirometry, exercise challenge testing); 6) findings from laboratory or external field tests; and 7) information about agents at the workplace (e.g., Safety Data Sheets, environmental monitoring data).



For those with asthma, education on self-management is key. Most people with asthma can control their symptoms and prevent asthma attacks by avoiding triggers and correctly using prescribed medications. Treatment methods include bronchodilators, which are used to relax muscles around airways, and anti-inflammatories (corticosteroids), which reduce swelling and mucus production inside airways. (Refer to [Understand Your Medication](#), American Lung Association.)

Consistent adherence with an [action plan](#) prescribed by a licensed health care professional is also commonly recommended. The following is an example provided by the CDC:

Green Zone: Doing Well

No cough, wheeze, chest tightness or shortness of breath; can do all usual activities. Take prescribed long-term control medicine such as inhaled corticosteroids.

Yellow Zone: Getting Worse

Cough, wheeze, chest tightness or shortness of breath; waking at night; can do some, but not all, usual activities. Add quick-relief medicine.

Red Zone: Medical Alert!

Very short of breath; quick-relief medicines don't help; cannot do usual activities; symptoms no better after 24 hours in Yellow Zone. Get immediate medical help.

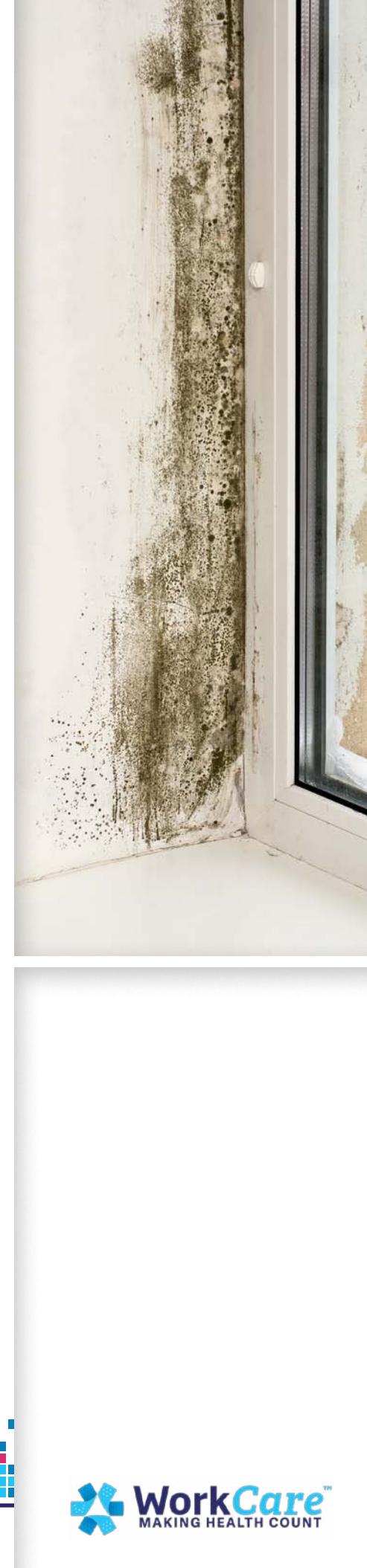
Prevention

Effective work-related asthma prevention depends on the identification of vulnerable populations and triggering agents in combination with exposure control. The following are among recommended action steps for employers:

- Conduct site audits to identify and abate existing and potential exposure agents, including mold, dust and chemical agents.
- Track worker asthma rates and efficacy of control measures.
- Ensure employees wear personal protective equipment (e.g., masks or respirators) as needed for the environment.
- Improve indoor air quality through measures such as smoke-free facilities, use of non-allergenic cleaning products and installation of efficient ventilation systems.
- Provide annual flu shots for all employees.

According to the National Institute for Occupational Safety and Health (NIOSH), work-related asthma prevention occurs at primary, secondary and tertiary levels:

1. Primary prevention measures may include pre-placement screening: "While elimination of the sensitizing agent is the ideal intervention, reduction of exposure to the agent, use of personal protective equipment and



limiting the number of people exposed to the agent should be considered if elimination is not possible."

- Secondary prevention includes routine medical screening for initial symptoms and signs of asthma in workers. Findings are used to guide early intervention that effectively slows or stops disease prevention. Many workers react to small quantities of an offending agent once they become sensitized to it. It is generally accepted that removal from exposure will result in a good outcome, provided that the worker has had symptoms for less than a year and has relatively normal **pulmonary function values**.
- Tertiary prevention includes pharmaceutical treatment such as inhaled corticosteroids and bronchodilators.

With regard to ongoing research, analysis of asthma data is expected to aid in further identification of industries and occupations with high current asthma prevalence and facilitate assessment of workers for new-onset or work-exacerbated asthma who could benefit from prevention and education programs.

In addition, **Healthy People 2020**, the nation's health care management blueprint, contains 22 respiratory disease objectives that address asthma education, detection, treatment and prevention efforts.

In summary, effective management of work-related asthma and prevention of related disability requires environmental interventions, intelligent use of medical management tools, and worker engagement that may require behavior change to avoid asthma triggers and consistent use of recommended drug therapies.

Resources

Refer to NIOSH's [primer on work-related asthma](#) and the agency's related web page, which features an extensive collection of articles and query tables. Additional resources include:

- [Allergic Diseases](#) (National Institute of Allergy and Infectious Diseases)
- [Preventing Allergic Reactions to Natural Rubber Latex in the Workplace](#) (Department of Health and Human Services and [Latex Allergy Safety and Health Topics Page](#) (OSHA))
- [Preventing Asthma in Animal Handlers](#) (Department of Health and Human Services)
- [Transitioning to Safer Chemicals: A Toolkit for Employers and Workers](#) (OSHA)



Occupational Asthma Facts and Figures

According to U.S. government sources:

- An estimated 11 million workers are annually exposed to at least one agent known to be associated with occupational asthma.
- Occupational factors are linked to up to 15 percent of disabling asthma cases in the U.S.
- Asthma exacerbations accelerate decline in lung function.
- People with work-related asthma have more symptomatic days, use more health care resources and have lower quality of life than those without asthma.
- About \$56 billion is spent annually on medical costs, lost productivity and premature deaths attributed to asthma.
- Isocyanates are one of the most common chemical causes of work-related asthma.
- Work-related asthma can develop over days or even years and continue to occur after exposure stops.