

Indoor Air Quality

Indoor air quality covers a broad range of issues including temperature extremes, stuff in the air and unpleasant odors. If you suspect a problem with the air quality in your space, please contact the EHS department or complete the [Health and Safety Concern](#) form.

Indoor Air Quality (IAQ) refers to the air quality within and around buildings and structures, especially as it relates to the health and comfort of building occupants. Understanding and controlling common pollutants indoors can help reduce your risk of indoor health concerns.

Health effects from indoor air pollutants may be experienced soon after exposure or, possibly, years later.

Immediate Effects

Some health effects may show up shortly after a single exposure or repeated exposures to a pollutant. These include irritation of the eyes, nose, and throat, headaches, dizziness, and fatigue. Such immediate effects are usually short-term and treatable. Sometimes the treatment is simply eliminating the person's exposure to the source of the pollution, if it can be identified. Soon after exposure to some indoor air pollutants, symptoms of some diseases such as asthma may show up, be aggravated or worsened.

The likelihood of immediate reactions to indoor air pollutants depends on several factors including age and preexisting medical conditions. In some cases, whether a person reacts to a pollutant depends on individual sensitivity, which varies tremendously from person to person. Some people can become sensitized to biological or chemical pollutants after repeated or high level exposures.

Certain immediate effects are similar to those from colds or other viral diseases, so it is often difficult to determine if the symptoms are a result of exposure to indoor air pollution. For this reason, it is important to pay attention to the time and place symptoms occur. If the symptoms fade or go away when a person is away from the area, for example, an effort should be made to identify indoor air sources that may be possible causes. Some effects may be made worse by an inadequate supply of outdoor air coming indoors or from the heating, cooling or humidity conditions prevalent indoors.

Long-Term Effects

Other health effects may show up either years after exposure has occurred or only after long or repeated periods of exposure. These effects, which include some respiratory diseases, heart disease and cancer, can be severely debilitating or fatal. It is prudent to try to improve the indoor air quality in your home even if symptoms are not noticeable.

While pollutants commonly found in indoor air can cause many harmful effects, there is considerable uncertainty about what concentrations or periods of exposure are necessary to produce specific health problems. People also react very differently to exposure to indoor air pollutants. Further research is needed to better understand which health effects occur after exposure to the average pollutant concentrations found in homes and which occurs from the higher concentrations that occur for short periods of time.

Primary Causes of Indoor Air Problems

Indoor pollution sources that release gases or particles into the air are the primary cause of indoor air quality problems. Inadequate ventilation can increase indoor pollutant levels by not bringing in enough outdoor air to dilute emissions from indoor sources and by not carrying indoor air pollutants out of the area. High temperature and humidity levels can also increase concentrations of some pollutants.

Pollutant Sources

There are many sources of indoor air pollution. These can include:

- Fuel-burning combustion appliances
- Tobacco products
- Building materials and furnishings as diverse as:
 - Deteriorated asbestos-containing insulation
 - Newly installed flooring, upholstery or carpet
 - Cabinetry or furniture made of certain pressed wood products
- Products for household cleaning and maintenance, personal care, or hobbies
- Central heating and cooling systems and humidification devices
- Excess moisture
- Outdoor sources such as:
 - Radon
 - Pesticides
 - Outdoor air pollution.

The relative importance of any single source depends on how much of a given pollutant it emits and how hazardous those emissions are. In some cases, factors such as how old the source is and whether it is properly maintained are significant. For example, an improperly adjusted gas stove can emit significantly more carbon monoxide than one that is properly adjusted.

Some sources, such as building materials, furnishings and products like air fresheners, can release pollutants more or less continuously. Other sources, related to activities like smoking, cleaning, redecorating or doing hobbies release pollutants intermittently. Unvented or malfunctioning appliances or improperly used products can release higher and sometimes dangerous levels of pollutants indoors.

Pollutant concentrations can remain in the air for long periods after some activities.

Learn more about indoor air pollutants and sources of:

- [Asbestos](#)
- [Biological Pollutants](#)
- [Carbon Monoxide \(CO\)](#)
- [Formaldehyde/Pressed Wood Products](#)
- [Lead \(Pb\)](#)
- [Nitrogen Dioxide \(NO₂\)](#)
- [Pesticides](#)
- [Radon \(Rn\)](#)
- [Indoor Particulate Matter](#)
- [Secondhand Smoke/ Environmental Tobacco Smoke](#)
- [Stoves and Heaters](#)
- [Fireplaces and Chimneys](#)
- [Volatile Organic Compounds \(VOCs\)](#)

Inadequate Ventilation

If too little outdoor air enters indoors, pollutants can accumulate to levels that can pose health and comfort problems. Unless buildings are built with special mechanical means of ventilation, those designed and constructed to minimize the amount of outdoor air that can "leak" in and out may have higher indoor pollutant levels.

How Outdoor Air Enters a Building

Outdoor air can enter and leave a building by: infiltration, natural ventilation, and mechanical ventilation. In a process known as infiltration, outdoor air flows into buildings through openings, joints, and cracks in walls, floors, and ceilings, and around windows and doors. In natural ventilation, air moves through opened windows and doors. Air movement associated with infiltration and natural ventilation is caused by air temperature differences between indoors and outdoors and by wind. Finally, there are a number of mechanical ventilation devices, from outdoor-vented fans that intermittently remove air from a single room, such as bathrooms and kitchen, to air handling systems that use fans and duct work to continuously remove indoor air and distribute filtered and conditioned outdoor air to strategic points throughout the house. The rate at which outdoor air replaces indoor air is described as the air exchange rate. When there is little infiltration, natural ventilation, or mechanical ventilation, the air exchange rate is low and pollutant levels can increase.

Indoor Air Quality and Community-based Actions

The Agency recognizes that communities must be the impetus for implementing local solutions for environmental health problems including indoor air. However, far too many communities lack the capacity to truly affect their environmental conditions. This includes some conditions found indoors, as well as conditions caused by outdoor impacts (such as climate change).

Many reports and studies indicate that the following populations may be disproportionately impacted by indoor asthma triggers, secondhand smoke, mold, radon and other indoor pollutants:

- children
- elderly
- low-income
- minority
- Tribes and indigenous people.

EPA's Indoor Environments Division (IED) provides guidance and programs to help build the capacity of communities to understand and avoid indoor and outdoor health impacts. IED's main objective is to improve indoor air quality in buildings where people live, learn and work.

Read more about:

- [Indoor Air Quality and Community-Based Action](#)

Revision #2

Created 2025-06-26 21:25:55 UTC by Marcus Carlton

Updated 2025-06-26 21:28:05 UTC by Marcus Carlton