



Department of Health

Bureau of Environmental Health and Radiation Protection

"To protect and improve the health of all Ohioans."

Health Assessment Section

Smoke Events

Answers to Frequently Asked Questions

What is a smoke event?

Smoke is a complex mixture of chemical gases, water vapor and particles produced when something is burned. The object that is burned is known as a fuel. Exactly what smoke is made of will depend on what fuel is being burned, how completely that fuel burns, the temperature of the fire, and several other factors.

A smoke event can be any fire that makes enough smoke to be a public health concern for many people like an entire community, town or state. There are many types of smoke events, including:

- Wildfires and forest fires
- Uncontrolled open burning
- Fires in warehouses or factories
- Gas explosions or fires involving large amounts of fossil fuels.

Which toxic chemicals are released during a smoke event?

Although the mixture of chemicals in smoke will vary from event to event, all smoke contains:

- Particulate matter: Tiny solid and liquid particles that can be inhaled (breathed in) and cause poor lung function; also called soot
- Carbon monoxide (CO): Colorless, odorless gas made from burning organic (natural) materials that can cause suffocation
- Carbon dioxide (CO₂): Colorless, odorless gas made from burning organic materials that can cause irregular heartbeat.

Some other common toxins in smoke are:

- Volatile organic compounds (VOCs): Group of toxic chemicals that evaporate (turn into gas) easily, which can cause throat and lung irritation if inhaled
- Polycyclic aromatic hydrocarbons (PAHs): Group of toxic chemicals that cause cancer; may be identified by their faint, pleasant smell
- Dioxins: Group of toxic chemicals that can build up in the fat of humans and animals; eating animal fat from an animal that was exposed to dioxins can make people sick
- Toxic heavy metals: Includes metals like mercury and lead.

What health problems can a smoke event cause?

Inhaling (breathing) smoke even for a short amount of time can cause immediate health effects including:

- Irritation or burning in the eyes, nose and throat
- Coughing, wheezing or difficulty breathing
- Chest pain
- Headache and dizziness
- Asthma attack (for people who have asthma)
- Fast heartbeat.

Particulate matter travels deep into your lungs when inhaled, causing shortness of breath, chest pain, irregular heartbeat, heart attack, worsening of lung and heart disease, and death in some people who have lung and heart disease.

Carbon monoxide is particularly dangerous to humans and animals. When you inhale too much CO, your body does not get enough oxygen. This is called CO poisoning. The most common symptoms are headache, dizziness, weakness, nausea, vomiting and confusion. Unconsciousness (passing out) and death can follow.



(Image source: Shutterstock)

Who is at risk?

Exposure to smoke can cause health problems for anyone, but certain people may be more at risk than others. This includes:

- People who have chronic (ongoing) heart or lung disease such as asthma, COPD, emphysema, angina or congestive heart failure
- The elderly
- Infants and children
- Pregnant women and their fetuses.

People who are often exposed to smoke, like firefighters, may be at more risk for certain long-term health problems such as heart disease and cancer.

How can I protect myself during a smoke event?

- Always follow the instructions and recommendations of first responders, like firefighters and public health officials. Obey all evacuation orders that are given.
- Shelter in place (stay in your residence). Unless you are ordered to evacuate or if the building you are in is not safe, stay inside with the doors and windows shut. You may use your central air or heat system, but close the fresh-air intake. Do not add more smoke by burning candles, firewood, food, or tobacco products. If it is not safe or too hot to stay in your own home, consider staying with a friend or relative, or visiting a public space that is cooler and safe from smoke.
- Limit your time breathing smoky air as much as possible. Cancel outdoor events like ball games and camping trips if they are going to be held in a very smoky area.
- Protect your lungs. If you must go outside, use an N-95 respirator (a special mask that prevents very tiny particles from passing through your nose and mouth into your lungs). An N-95 respirator will stop soot, but not chemical gases. Masks that only catch larger particles, like the ones sold at home improvement stores to catch sawdust, will not work. A wet cloth over your face will not stop most soot particles.
- Be sure that the CO detector in your home is working. Have extra batteries ready.
- Use caution when driving. Smoke can make the air hazy, which makes it difficult to see at a distance. Keep your car windows rolled up, and do not use the fresh-air intake if you are running your car's air or heat.
- Watch anyone who has a heart or lung disease closely for worsening illness, and make sure they have enough medication to last for several days, including a rescue inhaler if needed. Leaving a smoky area may be the best option for someone at high risk. If anyone appears to be having a health emergency, call 9-1-1.
- Stay hydrated. Drink plenty of water. If your eyes are irritated or burning, use over-the-counter artificial tear eye drops to relieve them. Running a humidifier in your home may provide some comfort.

How will I know if a smoke event is happening near me?

If there is a large smoke event near you, you may notice one or more of the following signs:

- Smell of smoke
- Hazy air
- Irritation in your eyes, nose, throat or lungs.

There may also be public alerts through local TV and radio news stations from one or more of the following agencies:

- Local health department
- Ohio Department of Health or other state agencies
- Local authorities, like police and fire department.



(Image source: Shutterstock)

Resources

AirNow. 2016. Wildfire Smoke: A Guide for Public Health Officials. U.S. Environmental Protection Agency (EPA).

AirNow. 2017. How Smoke From Fires Can Affect Your Health. U.S. EPA.

National Service Center for Environmental Publications (NSCEP). 2003. Particle Pollution and Your Health. U.S. EPA.

Public Health Division. 2014. Wildfire Smoke and Your Health. Oregon Health Authority.

Where can I get more information?

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