



## **Wildfire Preparedness and Response at Home** **September 18, 2020**

A wildfire is an unplanned fire burning in a natural area, such as a forest, grassland or prairie. They can happen anywhere in the country and can occur at any time throughout the year, but the potential is always higher during periods with little to no rainfall. This fact sheet provides information about the hazards posed by wildfires, especially smoke, and steps you can take to protect yourself and your family.

### **How Wildfire Smoke Can Affect You**

Smoke from wildfires contains ozone, carbon monoxide, nitrogen dioxide and fine particles that can harm health. The smallest and the most harmful fine particles are called particulate matter 2.5 (PM2.5). The greatest smoke hazard comes from breathing these fine particles in the air, which can reduce lung function and worsen asthma and other heart and lung conditions. Breathing in smoke can cause other immediate health effects including:

- Coughing
- Trouble breathing normally
- Stinging eyes
- Scratchy throat
- Runny nose
- Irritated sinuses
- Wheezing
- Shortness of breath
- Chest pain
- Headaches
- Tiredness
- Fast heartbeat

### **How You Can Be Exposed to Smoke and Other Harmful Substances**

*Inhalation.* The most common route of exposure, inhalation, or breathing in, results a chemical entering the airways. The chemical may only make it as far as the mucous membranes of the nose, or it may reach the smallest cavities of the lungs.

*Eye and Skin Contact.* Unlike inhalation, skin and eye contact with toxic chemicals normally results in damage at the point of contact.

*Ingestion.* Often accidental, this route of entry is not common unless personal hygiene is ignored. Don't eat, drink, smoke or chew around hazardous materials. Wash your hands before and after using the restroom.

## Who Is Most at Risk When Exposed

- If you have heart or lung disease, such as congestive heart failure, angina, COPD, emphysema or asthma, you are at higher risk of having health problems from smoke.
- Older adults are more likely to be affected by smoke, possibly because they are more likely to have heart or lung diseases than younger people.
- Children are more likely to be affected by health threats from smoke because their airways are still developing and they breathe more air per pound of body weight than adults. Children also are more likely to be active outdoors.

## Understanding the Air Quality Index (AQI)

The AQI is an index for reporting daily air quality and can be used to assess the level of concern posed by wildfire smoke in your area. The Environmental Protection Agency (EPA) calculates the AQI for five major air pollutants regulated by the Clean Air Act: ground-level ozone, particulate matter, carbon monoxide, sulfur dioxide and nitrogen dioxide. The AQI focuses on health effects individuals may experience within a few hours or days after breathing polluted air. The AQI runs from 0 to 500. The higher the AQI value, the greater the level of air pollution and the greater the health concern.<sup>1</sup> The EPA has a website, [AirNow](https://www.airnow.gov), at which you can enter your zip code, city and state to find the current and forecasted AQI and its color-coded rating. Below are the color codes and what they mean.

(AQI) Values	Levels of Health Concern	Colors	Meaning
0 to 50	Good	Green	Air quality is considered satisfactory, and air pollution poses little or no risk.
51 to 100	Moderate	Yellow	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.
101 to 150	Unhealthy for Sensitive Groups	Orange	Members of sensitive groups may experience health effects. The general public is not likely to be affected.
151 to 200	Unhealthy	Red	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects.
201 to 300	Very Unhealthy	Purple	Health alert: everyone may experience more serious health effects.
301 to 500	Hazardous	Maroon	Health warnings of emergency conditions. The entire population is more likely to be affected.

<sup>1</sup> Air Quality Index (AQI) Basics.

<https://cfpub.epa.gov/airnow/index.cfm?action=aqibasics.aqi#:~:text=The%20AQI%20is%20an%20index,days%20after%20breathing%20polluted%20air>

## **Wildfire Preparedness**

In a dangerous event, your first thoughts will be the safety of your family and friends. In case you are not together when authorities issue a fire weather watch or red flag warning (i.e., when the combination of dry fuels and weather conditions support extreme fire danger within the next 72 or 24 hours, respectively), remember that sending texts is often faster than making a phone call. Keep important numbers written down in your wallet, not just on your phone. It is sometimes easier to reach people outside of your local area during an emergency, so choose an out-of-town contact for all family members to call, or use social media.

*Practice how to use an ABC fire extinguisher.*

Make sure that each family member knows how to use an ABC fire extinguisher and knows where it is kept in the house. ABC fire extinguishers use a chemical to extinguish ordinary combustibles, flammable liquids and electrical fires and should be kept on hand in your home. Be sure to inspect them periodically and replace them as frequently as indicated in the owner's manual.

*Learn First Aid Skills.*

In most circumstances, when someone is hurt, a person on the scene provides the first assistance, before professional help arrives. Learn and practice response skills now so you will know what to do.

*Have an Evacuation Plan*

Whether you decide to evacuate or are asked to evacuate by state or local authorities, you will want to evacuate safely. It is important to know your community's local evacuation plan and identify several escape routes for your location in case roads are blocked. Include plans to evacuate people with disabilities and others with access or functional needs, as well as pets, service animals and livestock. If you will evacuate by car, keep your car fueled and in good condition. Be sure to bring the Five P's of Evacuation:

- People: People, and if possible, pets.
- Personal Needs: Emergency food and water supply, clothes, first aid kit, cash and chargers.
- Prescriptions: An emergency medicine supply (plan to keep medications that need refrigeration cold); medical equipment such as eyeglasses and hearing aids; emergency power sources for medical devices and flashlights (don't forget extra batteries); safety and personal items, including a face covering and hand sanitizer safety measures for COVID-19 (remember: face coverings do not protect against wildfire smoke).
- Papers: Important documents, including medical documents, wills, passports and personal identification.
- Priceless items: including pictures and irreplaceable mementos.

## Steps to Minimize Your Exposure to Wildfire Smoke<sup>2</sup>

During a wildfire event, here are steps you can take to minimize your exposure to smoke:

- 1. Pay attention to local emergency notifications and air quality reports.**  
Many communities have text or email alerting systems for emergency notifications. To find out what alerts are available in your area, do an Internet search with your town, city or county name and the word “alerts.” Find out if your community provides reports about the EPA’s AQI.
- 2. Refer to visibility guides if they are available.**  
Not every community has a monitor that measures the number of particles that are in the air. In the Western region of the United States, some communities have guidelines to help people estimate the AQI based on how far they can see.
- 3. If you are advised to stay indoors, keep indoor air as clean as possible.**  
Keep windows and doors closed unless it is extremely hot outside. Run an air conditioner if you have one but keep the fresh air intake closed and the filter clean to prevent outdoor smoke from getting inside. Running a HEPA filter or an electro-static precipitator (ESP) can also help you keep your indoor air clean. If you do not have an air conditioner and it is too warm to stay inside with the windows closed, seek shelter elsewhere. (Also, see the discussion of home ventilation below.)
- 4. Do not add to indoor pollution.**  
When smoke levels are high, do not use anything that burns, such as candles, fireplaces or gas stoves. Do not smoke, because smoking puts even more pollution into the air.
- 5. When going outdoors.**  
If you have to go outside, consider wearing a respirator. Bandannas, face coverings and surgical masks that do not fit tightly on your face will not provide protection. If you choose to wear a respirator, please make sure you wear it correctly so that it protects you. Even if you wear a respirator, spend as little time outdoors as possible. Refrain from physically exerting yourself — when you exert yourself, your breathing becomes deeper and quicker, which means you breathe in more smoke more deeply into your lungs. N95 respirators are tested to ensure they filter at least 95% of airborne particles. N95 respirator are the minimum level of protection. Ideally, you should use a P100 respirator.<sup>3</sup>

### Inside of Households

- Keep windows and doors closed as much as possible and manage ventilation (see discussion below).
- Minimize cleaning by dry sweeping.
- Install dual-sensor smoke alarms on each level of your home, especially near bedrooms; test monthly and change the batteries at least once a year (unless your detector has a long-life battery).
- A dustless method of cleaning such as washing with water and an effective detergent/wetting agent is recommended. Damp rag techniques should be used whenever possible to remove the substance from small surface areas or flooring. On those areas

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<sup>2</sup> Wildfires. <https://www.cdc.gov/disasters/wildfires/smoke.html>

<sup>3</sup> If you decide to use a respirator, please review the following instructions. <https://www.cdc.gov/niosh/docs/2010-133/pdfs/2010-133.pdf>

where damp rag techniques cannot be implemented (for example, carpets) vacuum cleaning methods should be applied.

- Floor sweepers with side brushes should not be used to clear aisles and floors because they may re-entrain dust particles into the air.
- Ash-coated fabrics should be rinsed under running water and then washed carefully.
- Soiled clothing will require extra detergent. Wash small loads of clothing, using plenty of water so the clothes will have room to move freely in the water. Do not mix heavily soiled clothes with garments that are lightly soiled.
- Be sure clothes are free of ash before putting them in an automatic dryer. Ash may scratch the inner surface of the dryer.

### **Managing Ventilation Before, During and After a Wildfire**

- Ensure the heating, ventilating, and air conditioning (HVAC) system is working properly and that air filters are clean and properly seated.
- Ask an HVAC technician for the highest filtration rating your HVAC system will support and use the highest rating possible when smoke is present. Filters with high filtration ratings require more frequent change-outs, but they can improve air quality.
- Consult with a qualified HVAC technician or ventilation engineer before reducing building air intake (i.e., outdoor air) to ensure the air pressure within the building remains slightly positive. If the indoor air pressure becomes lower than outdoor pressure, outdoor smoke will tend to get pulled into the building through the exhaust system and other openings.
- Portable high efficiency particulate air (HEPA) cleaners can improve air quality in small, walled spaces. HEPA filters reduce indoor particle levels but most are not effective at removing gasses and odors. Do not use ozone generators or personal air purifiers, electrostatic precipitators and ionizers that produce ozone. Ozone is an irritant that worsens lung disease. Humidifiers and dehumidifiers are not air cleaners and will not do much to reduce particles in the air during a smoke event.
- For several months after an ashfall, filters may need replacing often. Air conditioner and furnace filters need careful attention. Clean refrigerator air intakes. Clean any surface that may blow air and recirculate the ash. Stove fans and vents should be cleaned thoroughly.

### **Aftermath**

Once the local fire or law enforcement authorities say that it is safe, you may return to your home. Be aware that fire damages the stability of a structure. If it has been affected by fire, your home or office should be inspected by a professional and certified that it is safe before you go into it. Below is an overview of steps and precautions to take in dealing with the aftermath of a wildfire that has affected your home.

#### *Inside & Outside Safety*

- Use caution when entering burned areas. Hazards may still exist, including hot spots that can ignite or trees that can fall without warning.
- Avoid walking on smoldering surfaces. After a fire, the ground may contain heat pockets that can cause severe injury or spark another fire.

- Check the attic of your home. If you see smoke or fire, get out of the house and call 911.
- Wear leather gloves to protect your hands and heavy, thick-soled shoes to protect your feet.
- Look out for power poles that may be unstable due to the fire. Stay away from downed power lines and report them to 911 or the power company's emergency number.
- Watch for ash pits (holes created by burned tree roots that are filled with hot ash), charred trees, smoldering debris and live embers, and mark them for safety.
- Check the roof and gutters. If possible, wet them down to completely put out any smoldering sparks or embers. If you see that fire is still present, call 911.

### *Communications*

- Use local alerts, radio and other information sources, such as FEMA or American Red Cross apps, to get information and advice as soon as it is available.
- Use text messaging or social media to communicate with family and friends.
- Telephones and cellular phone systems are often overwhelmed following a disaster, so use phones only for emergency calls.

### *Health and Sanitation*

- Call 911 and seek help immediately if you or someone you're with has been burned. Cool and cover burns to reduce the chance of further injury or infection.
- Discard food exposed to heat, smoke or soot. When in doubt, throw it out.
- Do not use water for drinking, brushing teeth, preparing food, washing or bathing until officials indicate the water source is safe.
- Follow the recommendations from your local health department. For example, authorities may recommend tetanus shots because bacteria may be present in contaminated soil.

### *Care for Loved Ones*

- Look for signs of depression or anxiety related to this experience, such as feeling physically and mentally drained; having difficulty making decisions or staying focused; becoming easily frustrated on a more frequent basis; feeling tired, sad, numb, lonely or worried; and changes in appetite or sleep patterns. Seek help from local mental health providers if you detect these signs in yourself or others.

### *Ash Removal*

- Do not remove ash until it has cooled, and it no longer contains hot spots.
- The finer the ash, the more difficult it will be to pick up.
- Picking ash up with machinery will be difficult; experiment with different "binders." Wet sawdust has worked well as a binder during cleanup operations and is cost effective.
- Remove flammable and combustible materials from around the area where ash is being handled.
- Consider maintaining a fire watch while removing materials.
- Where construction and demolition debris may be mixed with vegetative debris, test the ash for hazardous components before removal.

- Use water spray or mist to suppress dust generation, but do not soak the ash. Heavy water will slow the process down.
- Don't walk in a single file line. People behind the "leader" will become engulfed in ash.
- Keep machinery traffic low, as needed only.
- Don't use blowers to move ash. There is no need for vigorous sweeping.
- Use blowers only to remove ash from sensitive equipment.
- Use vacuums that include a HEPA filter and are approved for ash.

#### *Personal Protective Equipment*

- Protective clothing ranging from standard coveralls to a chemical resistant suit with hood and booties.
- Respirator ranging from an N95 to a PAPR for high exposure and strenuous work. In rare cases, a supplied air respirator may be required.
- Protective footwear with steel toe and insole. A chemical resistant boot or outer boot may be required for some work.
- Disposable cut and abrasive resistant work glove. A chemical resistant glove may be required for some work.
- Fully enclosed goggles or face shield (better for ash) or safety glasses.
- Ear protection in noisy areas.
- Head protection if in construction or demolition zones.
- If you are working near downed power lines: Nomex clothing compliant with NFPA 1500, rubber gloves, dielectric overshoes and insulated tools

#### *Debris that Could Contain Fire Retardant, Ash, Asbestos, Silica and Other Toxins*

Protect yourself from breathing dust. It can contain toxic material.

- An N95 or greater respirator is acceptable for most activities, including those involving silica and portland cement dust.
- If asbestos may be present, use a half-mask elastomeric respirator with N, R or P-100 series filters.
- If airborne contaminants are causing eye irritation, full-face respirators with P100 OV/AG combination cartridges should be used. Surgical masks should **not** be used because they do not provide adequate protection.