

## Wildfire Smoke and Health

### What You Need to Know

#### **If moderate to heavy smoke is visible, air quality has reached levels that are unhealthy**

- Consider limiting outdoor activity when moderate to heavy smoke is present and relocating temporarily if smoke is present indoors and is making you ill.

#### **Not everyone who is exposed to wildfire smoke will have health problems**

- Factors that increase the likelihood of smoke-related health problems include:
  - Level and duration of exposure
  - Children, elderly and pregnant women
  - Pre-existing asthma, COPD, other chronic lung or heart diseases

#### **Most healthy adults and children will recover quickly from smoke exposure and will not suffer long-term health consequences**

#### **Particulate matter exposure is the principal public health threat from short-term exposures to wildfire smoke.**

- Fine particles are eye and respiratory irritants, and exposures to high concentrations can cause persistent cough, phlegm, wheezing, and difficulty breathing.
- Particulate matter may also affect the body's physiological mechanisms that remove inhaled foreign materials from the lungs, such as pollen and bacteria.
- Days to weeks of exposure can cause reduced lung function, bronchitis, exacerbation of asthma and heart failure.

#### **What are symptoms related to smoke exposure?**

- Eye, nose and/or throat irritation--runny eyes and/or nose.
- Coughing, sore throat.
- Trouble breathing or tightness of the chest, which may be symptoms of a health emergency.
- The onset of symptoms related to pre-existing respiratory ailments like asthma or emphysema.
- Weakened immune system after prolonged exposure to smoke.

# How to Protect Your Health

## Stay indoors

- Close windows and doors to reduce exposure to smoke
- If doors and windows are left open, particle levels indoors and outdoors will be about the same.
- When air quality improves, even temporarily, residents should “air out” their homes to reduce indoor air pollution.
- If outdoor temperatures are very high, those without air conditioning to stay with friends or with family members who do, to go to a cleaner air shelter in their community, or to leave the area to avoid heat exhaustion or heat stroke.

## Use air conditioners

- Homes with central air conditioners generally have lower amounts of outdoor particles indoors compared to homes that use open windows for ventilation.
- Most air conditioners are designed by default to re-circulate indoor air. Those systems that have both “outdoor air” and “re-circulate” settings need to be set on “re-circulate” during fire/smoke events.
  - For newer air conditioners with a “fresh air ventilation system” that brings in outdoor air continuously or semi-continuously, the “fresh air” component of the system should be turned off during smoke events.
- Little is known about the impact of using various types of room air conditioners (e.g., window units) and their air filters on indoor smoke concentrations in homes.

## Reduce activity

- Reducing physical activity to lower the dose of inhaled air pollutants and reduce health risks.

## Reduce other sources of indoor air pollution

- Smoking cigarettes, using gas, propane and wood-burning stoves and furnaces, spraying aerosol products, frying or broiling meat, burning candles and incense, and vacuuming can all increase particle levels in a home and should be avoided when wildfire smoke is present.
- “Room-vented” or “vent-free” appliances such as unvented gas or propane fireplaces, decorative logs, and portable heaters can especially contribute substantial quantities of particles.

## Respiratory protection

- Surgical masks are not designed to capture a large percentage of small particles and will not prevent the wearer from breathing in airborne particles such as contained in wildland smoke.
- Covering the mouth with a (damp or dry) bandana, handkerchief, or tissue also will not prevent the wearer from breathing in airborne particles.
- N95 and P100 particulate filtering facepiece respirators or respiratory protection devices with a higher level of protection are more appropriate for the public for this type of inhalation hazard.

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# Sensitive Populations

## Children

- All children, even those without any pre-existing illness or chronic conditions, are considered a sensitive population because their lungs are still developing, making them more susceptible to air pollution than healthy adults.
- Symptoms from smoke inhalation can include coughing, wheezing, difficulty breathing, and chest tightness. Even children who do not have asthma could experience these symptoms. Air pollution from wildfire can make asthma symptoms worse and trigger attacks.
- Limit children's vigorous outdoor activities during smoky conditions: they inhale more air (and therefore more smoke constituents) per pound of body weight
- Children may also experience significant emotional distress, resulting from anxiety and grief following a wildfire.

## Older adults

- Older adults are considered to be at increased risk of health effects attributed to short-term exposures to wildfire smoke due to a higher prevalence of pre-existing lung and heart diseases.
- Older adults may also be more affected than younger people because important physiologic processes, including defense mechanisms, decline with age.
- Short-term exposures to fine particles have often reported a greater risk of health effects, including hospital admissions, in older adults.

## Pregnant women

- Pregnant women are at increased risk of the adverse effects of wildfire smoke both as individuals and the potential for adverse effects to their fetus, during a critical window of human development.
- Numerous physiologic changes occur during pregnancy increasing a woman's vulnerability to environmental exposures, such as increases in blood and plasma volumes and increased respiratory rates.
- Additionally, psychosocial stress exacerbated by wildfires is another mechanism through which wildfire events may affect health of pregnant women and their fetus.

## Individuals with asthma and other lung (respiratory) disease

- Levels of pollutants that may not affect healthy people may cause breathing difficulties for people with asthma, COPD, or other chronic lung diseases.
- Individuals with COPD may also experience worsening of their conditions because of exposure to wildfire smoke.

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## Individuals with cardiovascular disease

- Diseases of the circulatory system include high blood pressure, heart failure, and vascular diseases, such as coronary artery disease, and cerebrovascular conditions, such as diseased arteries (atherosclerosis) that bring blood to the brain. Studies have linked fine particulate matter to increased risks of heart attacks, heart failure, cardiac arrhythmias, and other adverse effects in those with cardiovascular disease.
- In response to exposure to particulate matter people with chronic lung or heart disease may experience one or more of the following symptoms: shortness of breath, chest tightness, pain in the chest, neck, shoulder or arm, palpitations, or unusual fatigue or lightheadedness.

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