Recommendations for wildfire smoke and COVID-19

There is concern about wildfire smoke overlapping with COVID-19 and increasing the health impacts.

This guidance will help air quality and public health officials in Washington state respond to wildfire smoke events during these unique circumstances. It covers the main wildfire smoke guidance and indicates how it is impacted by COVID-19, with updated recommendations that address wildfire smoke during the pandemic. Additional resources, such as factsheets, are included for each topic. COVID-19 public health guidance may vary by region, and this guidance can be adapted to fit local needs.

Overlapping Health Impacts of Wildfire Smoke and COVID-19

Breathing in wildfire smoke can produce harmful health effects. These range from minor symptoms, such as eye, nose, and throat irritation or headaches, to more severe symptoms like shortness of breath, chest tightness, asthma attacks, and worsening existing chronic conditions. Some of these respiratory symptoms, including dry cough, sore throat, and difficulty breathing, are also common symptoms of COVID-19.

Both COVID-19 and wildfire smoke exposures adversely impact the respiratory and immune systems and increasing evidence suggests experiencing both can lead to worse health outcomes. Past research indicates wildfire smoke exposures can make people more susceptible to respiratory infections like pneumonia and bronchitis, and epidemiological studies indicate this likely includes COVID-19. Recent studies also indicate that poor air quality can make symptoms and health outcomes in people with COVID-19 more severe. This suggests people with COVID-19 have greater risk of negative health effects from wildfire smoke exposure.

Populations sensitive to wildfire smoke exposures include people with heart and lung diseases, people with respiratory infections, people with diabetes, stroke survivors, infants, children, pregnant people, and people over 65 years of age. People can be at increased risk due to health status, life stage, lack of access to resources or health care, or environmental injustices that most seriously harm people of color. Some of these groups are also those most at risk for getting very sick from COVID-19.

Additional Considerations for COVID-19: Seek medical attention when experiencing severe symptoms, such as chest pain or difficulty breathing, including during wildfire smoke events. If you have a fever, cough, or shortness of breath, treat it like it could be COVID-19. Protect others by following current COVID-19 public health recommendations and get a COVID-19 vaccine. If you are concerned about your health, call your health care provider to discuss COVID-19 testing and other possible reasons for your illness.

Reducing Exposure to Wildfire Smoke when there's risk of COVID-19 transmission

The following information identifies normal recommendations to reduce exposure to wildfire smoke and provides additional guidance to consider the impact of COVID-19 related restrictions. Additional information about how to protect yourself from wildfire smoke is available on WA Department of Health's (WA DOH) Smoke from Fires webpage.

Stay indoors and keep indoor air clean

When the air quality is poor from wildfire smoke, reduce outdoor physical activity. As the air quality worsens you will need to go indoors and take additional steps to keep smoke out of your home and improve air filtration to keep indoor air clean.

Additional Considerations for COVID-19: COVID-19 is more easily spread indoors. When there is wildfire smoke it is more difficult to bring in outside air to reduce risk of transmission of COVID-19. Indoor air filtration is the best way to protect yourself from exposure to wildfire smoke and COVID-19 when indoors.

Resources:

- EPA's information on wildfires and indoor air quality
- EPA's information on creating a clean room
    - How to Create a Clean Room at Home factsheet
- EPA's Indoor Air Filtration Factsheet

Reduce intake of smoke into your home

To keep indoor air clean and wildfire smoke from entering your home:

- Close windows and doors when it is smoky outside. Track the air quality and open your windows for fresh air when the air quality improves.
    - Check wildfire and smoke locations on the Washington Smoke Information blog.
    - The Washington Air Quality Guide for Particle Pollution provides health recommendations for the different color-coded air quality categories based on EPA's Air Quality Index (AQI).
- It can be challenging to keep cool inside while keeping smoke out. Pay attention to heat as heat-related illness can occur quickly and be life threatening. These steps can help you stay cooler:
    - Close windows and curtains or shades during the day and use portable fans.
    - Minimize the use of your stove and oven during the hottest parts of the day.
    - Cool off by taking a cold bath or shower.
    - Use ice packs or put your feet in cool water. Apply wet rags on the back of your neck or mist yourself with water while sitting near a fan (evaporative cooling).
    - Stay hydrated. Avoid sugary or alcoholic drinks since these can be dehydrating.
    - Go to an indoor place that is cooler—even if only for a few hours. For updated information on cooling centers in your community, visit Washington 2-1-1.

- o Only open windows when it is cooler outside than inside, and, if possible, take steps to filter indoor air (see below).
  - o Track the air quality and open your windows when the air quality improves.
  - o For more information see, WA DOH's information on Hot Weather Safety & CDC's Tips for Preventing Heat-Related Illness.
- Set HVAC system fans and window air conditioning units on recirculate to prevent intake of outside smoky air unless you have MERV 13 filters.

Additional Considerations for COVID-19: Increased dilution and ventilation is a part of reducing transmission of COVID-19. See WA DOH's guidance for Ventilation and Air Quality for Reducing Transmission of Airborne Illnesses. When there is poor air quality due to wildfire smoke, opening windows or bringing in unfiltered outside air through ventilation brings smoke indoors, which is also a health risk. Depending on the circumstances of your household, you may have to balance the risk of COVID-19 and wildfire smoke exposure. Follow other steps to reduce exposure to each hazard, such as masking and physical distancing if there is someone sick in your household. Bring in outside air when air quality improves.

Avoid activities that create indoor air pollution

Do not add to indoor air pollution during wildfire smoke events. Avoid the following activities:

- Burning candles, incense, and wood in fireplaces.
- Using sprays, diffused essential oils, or air fresheners.
- Broiling or frying food, and limit use of gas or propane stoves or ovens.
- Smoking or vaping indoors.
- Sweeping or vacuuming unless your vacuum has a HEPA filter, because vacuuming and sweeping stir up particles.
- Using gas or propane furnaces or heaters.

Avoid using strong-smelling cleaning or household products. Cleaning is useful for protecting health, but products, including cleaners, sanitizers, and degreasers, often add harmful chemicals into the air. Even products advertised as "green" or "natural" may contain ingredients that can cause health problems. It is always important to limit your exposure to harmful chemicals, but health impacts can be even worse with multiple sources of pollution and limited ventilation. Disinfection is rarely needed. Cleaning with plain soap and water will remove most organisms. See WA DOH's Safely Cleaning and Disinfecting Public Spaces for more information.

Improve indoor air filtration

Filtration of air in your home will improve the indoor air quality and reduce your exposure to respiratory disease and smoke during wildfire smoke events. There are three ways to improve indoor air filtration of smoke particles in your home: 1) increase filtration in the heating, ventilation, and/or air conditioning (HVAC) system, 2) use a portable air cleaner with a HEPA filter, or 3) use a Do It Yourself (DIY) box fan filter. There are different technical considerations, equipment, and supplies with each of these options. Buy necessary materials before wildfire season as supplies will sell quickly once wildfire smoke hits. If you cannot keep the air clean

throughout your home with adequate filtration of your HVAC system, consider establishing [a cleaner air room](#) with the use of either a HEPA portable air cleaner or a DIY box fan filter where you spend more time.

1. **Increase HVAC filtration**

Improved filtration through an HVAC system is the best way to reduce fine particles (PM2.5) from wildfire smoke throughout your home, rather than only a single room or designated space.

- Consult your HVAC manual or with an HVAC professional before making improvements.
- Increase the filtration in your home HVAC system to a MERV 13 rated filter or the highest rated filter your system will handle. Select a filter with the deepest pleat your system can accommodate to prevent excess strain on the system. The filter must fit tightly. For more information, see [EPA's What is a MERV rating?](#)
- Set the system fan to recirculate and a continuous running fan mode, "on" instead of "auto".
- If you do not have a MERV 13 filter, close the fresh air intake to keep smoke out during a smoke event. Reopen it when air quality improves.
- Change the filter when dirty or as indicated by the manufacturer's instructions or an HVAC professional. This may be more often during long periods of wildfire smoke.

Resources:
- [EPA's Indoor Air Filtration Factsheet](#)
- [EPA's info on "Can running the HVAC system in my home help protect me from COVID-19?"](#)
- [WA DOH's guidance for Ventilation and Air Quality for Reducing Transmission of Airborne Illnesses](#)

2. **Use a HEPA portable air cleaner**

Using a portable air cleaner with a HEPA filter can reduce fine particles (PM2.5) from wildfire smoke in a single room or designated space.

- Select a portable air cleaner with a true HEPA filter. Beware of portable air cleaners that claim to have "Near HEPA", "HEPA like", or "HEPA Type" filters.
- Select a one that is rated for the size of room or space where you plan to use it. Keep in mind the amount of space includes anything that you can't close off with doors or otherwise. The clean air delivery rate (CADR) is a rating given to the portable air cleaner based on its fan speed and filter efficiency. The smoke CADR should be equal to the square footage of the intended room of use.
- Consider the noise rating, as some can be quite loud. Choosing a portable air cleaner with a CADR for a larger size room and running it at a lower setting can reduce the noise.

- Do not use ozone generators, electrostatic precipitators and ionizers, UV light, or negative ion air purifiers because they can produce harmful by-products, including ozone. Ozone can damage your lungs and can aggravate asthma and other lung diseases. Check that an air cleaner has been certified to produce low ozone (less than 50 ppb ozone) through the California Certified Air Cleaning Devices portal.
- A HEPA portable air cleaner that also has charcoal filtration can help remove some volatile organic chemicals and smells.
- Place the portable air cleaner in a room where you spend time, with the windows and doors closed. When starting up the portable air cleaner, or if you choose to change the room where you use the portable air cleaner, be aware that it will take some time for the fine particles to decline. The amount of time it takes to filter the air in the room and how well it works depends on things like the design of the air cleaner, fan speed, and the size of the closed off room.
- Change the filter when dirty or as indicated by the manufacturer's instructions.

Resources:

- California Air Resources Board Air Cleaner Information for Consumers
- California Certified Air Cleaning Devices
- California's Air Cleaning Devices for the Home Factsheet
- EPA's Guide to Air Cleaners in the Home
- EPA's info on "Will an air cleaner or air purifier help protect me and my family from COVID-19 in my home?"
- NIH's Selection and Use of Portable Air Cleaners to Protect Workers from Exposure to SARS-CoV-2

3. Use a DIY box fan filter

Making your own box fan filter can be a less expensive option to reduce fine particles (PM2.5) from wildfire smoke in a single room or designated space. When building your own box fan filter, it is important to understand the limitations. While testing by Underwriters Laboratories Inc. (UL) in collaboration with EPA found no safety concerns, box fans are not designed to operate with a filter attached and effectiveness varies with design and supplies selected. EPA does not recommend them as a permanent alternative to products of known performance, like commercially available HEPA portable air cleaners.

- Select a 2012 or newer standard 20" x 20" box fan and the number of MERV 13 filters of the same size for the design that you select.
- What to look for in a box fan:
    - One with a UL or ETL safety marking. Newer models have added safety features.
    - Box fans built before 2012 may pose a fire risk. If you do use an older model, do not leave it unattended or use while sleeping.
    - It's helpful to select a fan where the control settings and power cord are located on the exterior rim of the fan so that they are accessible after the filter has been attached.

- There are different designs to consider. The simplest design is to attach a single filter to a fan. A design with multiple filters can reduce the burden on the fan motor.
- The arrows on the filter should follow the direction of the air flow through the fan.
- Follow the box fan manufacturer's instructions, including:
  - Do not leave children unattended when in use.
  - Do not use an extension cord.
- Place the constructed DIY box fan filter in a room where you plan to spend most of your time and where you can keep windows and doors closed. It will be more effective in smaller rooms.
  - Position the filter where it is at least a foot away from a wall, furniture, or other objects so that the air flow of the fan is not blocked.
  - Do not operate it in a window. This results in reduced filtration and the filter will get dirty faster. It is also difficult to create a seal when placed in an open window, meaning that more unfiltered air will enter the room.
  - Puget Sound Clean Air Agency found that it takes at least 10 to 15 minutes to significantly clean the air in a small room (15' x 15') with a DIY box fan filter.
- Keep windows and doors closed to prevent infiltration of outside smoke.
- Change the filter when dirty. This may be more often during smoke events. Have extra filters on hand.

Resources:

- [WA Department of Ecology's video on how to make your own clean air fan](#)
- [Puget Sound Clean Air Agency's info on DIY air filters](#)
- [Coleville Tribes Air Quality Program box fan filter a DIY users guide](#)
- [BC Centre for Disease Control's factsheet on Home-made Box Fan Air Filters](#)
- [EPA's Research on DIY Air Cleaners to Reduce Wildfire Smoke Indoors](#)

Additional Considerations for COVID-19: Increased filtration is a part of reducing transmission of COVID-19 ([WA DOH's guidance for Ventilation and Air Quality for Reducing Transmission of Airborne Illnesses](#)). Running an HVAC system and using a HEPA portable air cleaner or DIY box fan filter is the best way to reduce your exposure to wildfire smoke and COVID-19 transmission while at home. Depending on the scenario in your household, such as whether someone is isolating with COVID-19 and if they are especially sensitive to wildfire smoke, you may have to prioritize where indoor air filtration devices go in your home. Consider having enough filtration devices to create a cleaner air room for wildfire smoke and an isolation room for COVID-19. Indoor air filtration devices can be moved back and forth; however, every time the device is moved, it will take some time for it to clean the air in the room. Follow other steps to reduce exposure to each hazard, such as masking if there is someone sick in your household. See WA DOH's [COVID-19 Resources and Recommendations](#) for more information about COVID-19.

Seeking Cleaner & Cooler Air Elsewhere

Spending time in cleaner air that is cooler can provide relief from wildfire smoke and heat. If you cannot keep the air clean or cool inside your own home, consider going to a friend's place, public space, or unimpacted area.

Additional Considerations for COVID-19: It might not be safe or as accessible for people to go to public spaces to seek cleaner and cooler indoor air away from home, depending on the COVID-19 situation in that location (e.g., level of COVID-19 in the community). With the congregation of people at these settings, there is increased risk of transmission of SARS CoV-2, the virus that causes COVID-19. Check in advance to see if these places are open and be prepared for lower capacity or to wear a well-fitted mask.

If you decide to leave the area and visit a friend or relative, consider COVID-19 restrictions in the county you are traveling to and circumstances of the people you are visiting, including vaccination status. This is important if either they or you are more sensitive to COVID-19 and should be especially cautious about exposures. Get a COVID-19 vaccine to reduce risks when gathering with friends or relatives during smoke events and follow local guidance for indoor gatherings.

Resources:

- [CDC's Recommendations for Cooling Centers and COVID-19](#)

Respirators

When you have no other way to avoid wildfire smoke, certain types of respirators can provide some protection. N95 or other NIOSH-approved respirators filter out most fine particles in smoke but not hazardous gases, such as carbon monoxide. These respirators can be found at many hardware and home repair stores and pharmacies. It's important to take necessary steps to wear them correctly to achieve a proper fit and seal to provide protection. If worn improperly, they may not provide as much protection. See WA DOH's [Wildfire Smoke and Face Masks Fact Sheet](#) for information on proper use and fit. Respirators also do not work for everyone.

- Respirators will provide less protection for people with beards and facial hair because they do not seal as well to the face.
- NIOSH approved respirators do not come in suitable sizes for very young children and have not been tested for broad use in children. Effective use requires proper selection, size, and fit. See [Western States PEHSU guidance](#) on respirator use by children.
- Wearing a respirator makes it more difficult to breathe. Anyone with lung disease, heart disease, or who is chronically ill should consult a health care provider before using a respirator.

In indoor spaces where you do not have the ability to keep windows closed or filter indoor air, wearing an N95 respirator for short durations could be helpful if outdoor smoke levels are high. Examples of these spaces could include public transportation and commercial or public buildings.

For respirator requirements for employees working outside, see [Washington Department of Labor and Industry's information](#) on wildfire smoke and worker safety and health.

Additional Considerations for COVID-19: When worn properly, respirators approved by the National Institute for Occupational Safety and Health (NIOSH) (such as N95s) offer the most COVID-19 protection, followed by international respirators (such as KN95s and KF94s), surgical masks, and then cloth face masks. N95 respirators with exhalation valves can provide protection from wildfire smoke, but they are not recommended for COVID-19. KN95 masks or masks approved in other countries may not provide the same protection as NIOSH-approved respirators because they are not regulated in the United States. Cloth face coverings, surgical masks, and masks with filter inserts generally do not provide much protection from the fine particles in smoke. If you have to go outside, using the best mask available and wearing it properly can be a helpful option for some people for a limited time. If you need to bring in outside air when there's wildfire smoke to reduce transmission of COVID-19, wearing an N95 respirator indoors for a short duration could also help, as this can protect from COVID-19 and wildfire smoke when properly worn and fitted.

Resources:

- [NIOSH's Personal Protective Equipment for the Public](#)
- [WA DOH's Masks Guidance During COVID-19](#)

Guidance for Outdoor Testing and Vaccination Clinics

Wildfire smoke may pose a health threat, and local public health officers may need to consider canceling or moving outdoor events and activities. During the COVID-19 pandemic, this could include outdoor testing and vaccination clinics. WA DOH & state Department of Ecology's (WA ECY) "[Guidance on Canceling Events or Activities and Closing Schools](#)" can help in decisions by local public health officers to protect public health during periods of poor air quality due to wildfire smoke.

When the outdoor 24-hour forecast or NowCast PM2.5 concentrations:

- Equal or exceed 55.5 µg/m^3 ("Unhealthy" category, AQI value 151), consider canceling outdoor public events and activities.
- Equal or exceed 150.5 µg/m^3 ("Very Unhealthy" category, AQI value 201), cancel outdoor public events and activities.

In addition to the action levels, other factors and issues specific to your area should be considered when making decisions about closures and cancellations to protect health and welfare of the public. One factor to consider is expected duration of exposure for people participating in the event (see full guidance for additional factors). In the case of outdoor testing and vaccination clinics, exposures may be shorter for the public when visiting than for the employees or volunteers working there for an entire shift. Please visit WA Labor and Industries (L&I) [website](#) for more information about rules to protect workers from wildfire smoke.

If testing and vaccination clinics are moved indoors due to smoke, follow best practices to improve indoor air quality in commercial buildings.

- [WA DOH's Improving Ventilation and Indoor Air Quality during Wildfire Smoke Events](#)
- [EPA's Wildfires and Indoor Air Quality in Schools and Commercial Buildings](#)
- [ASHRAE's Planning Framework for Protecting Commercial Building Occupants from Smoke During Wildfire Events](#)

Behavioral Health Considerations

Long periods of wildfire smoke can impact mental and behavioral health. This is exacerbated with the ongoing COVID-19 pandemic. Wildfire smoke and disasters impact our daily routine, including limiting the time we spend outside and changing activities. There may be feelings of isolation from staying inside or sadness from the lack of sunshine. Wildfire smoke is also a direct threat to health and safety.

Protecting mental health and physical health are both extremely important.

- Social connection is key. Identify someone you can ask for help and one person who may need your help. Check in with loved ones throughout a wildfire smoke episode.
- Spend time with loved ones in areas of the home that have cleaner air or go to a public space with cleaner air together.
- Build DIY box fan filters together.
- Get some light exercise indoors.
- Spend time with your pets and play games indoors to get them some exercise as well.
- Follow other tips to take care of your emotional health.
  - Eat healthy and stay hydrated.
  - Get enough sleep.
  - Watch movies that evoke laughter and/or emotion.
  - Create something: writing, music, art, etc.
  - Get a massage and/or acupuncture.
  - Consider eating dark chocolate and spicy foods, these increase endorphins.

Resources:

- [AirNow's Coping with the Stress of Wildfire smoke](#)
- [WA DOH's Behavioral Health Resources and Recommendations](#)
- [Clean Air Methow & University of Washington's community resource guide](#)
- [CDC's information on Coping After Natural Disasters](#)

More Wildfire Smoke Information and Resources

For more information on the health impacts of wildfire smoke and answers to frequently asked questions, visit the WA DOH's [Smoke from Fires webpage](#) and your [local health jurisdiction](#)'s webpage. Updates on wildfire status can be found on the [WA Smoke Blog.](#) Additional information on air quality during wildfires can be found on the [WA state Department of Ecology](#) and your [regional clean air agency](#) websites.

Additional resources related to wildfire smoke and COVID-19:

- [CDC's Wildfire Smoke and COVID-19](#)
- [EPA's COVID-19, Wildfires, and Indoor Air Quality](#)

- EPA's Wildfire Smoke: A Guide for Public Health Officials

More COVID-19 Information and Resources

Stay up-to-date on the current COVID-19 situation in Washington, symptoms, how it spreads, how and when people should get tested, and where to find vaccines. See our Frequently Asked Questions for more information.

A person's race/ethnicity or nationality does not, itself, put them at greater risk of COVID-19. However, data are revealing that communities of color are being disproportionately impacted by COVID-19. This is due to the effects of racism, and in particular, structural racism, that leaves some groups with fewer opportunities to protect themselves and their communities. Stigma will not help to fight the illness. Share accurate information with others to keep rumors and misinformation from spreading.

- WA State Department of Health COVID-19 Response
- Find Your Local Health Department or District
- CDC Coronavirus (COVID-19)

Have more questions? Call DOH at **1-800-525-0127.**

For interpretative services, **press #** when they answer and **say your language.** For questions about your own health or testing results, please contact a health care provider.

To request this document in another format, call 1-800-525-0127.

Deaf or hard of hearing customers, please call 711 (Washington Relay) or email civil.rights@doh.wa.gov.