

During the Fire: Smoke, Air Quality, and Protecting Yourself

Booklet B

from the *Understanding Health Impacts of Wildfires in Urban Areas* series

Other booklets in this series:

A. Health Impacts of Wildfires in Urban Areas
B. During the Fire: Smoke, Air Quality, and Protecting Yourself
C. After the Fire: Lead and other Fire Contaminants in and around your Home
D. Mental Health and Wildfires
E. Further Reading

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Series Note: This series addresses some of the health concerns from wildfires that reach urban areas. These fires are also called Wildland-Urban Interface (WUI) fires. Since the general public may not use the term WUI, we use "wildfires that reach urban areas" or, more briefly, "fires" to refer to large, catastrophic fires that may also burn buildings, cars, and other non-natural sources.

Key point!



Look for these "Key points" throughout this handout for the most important summaries.

Quick Overview:

Protecting yourself from harmful fire smoke

What you need to know to protect yourself!

Why is wildfire smoke dangerous to our health?

- **Wildfires that reach urban areas can create harmful smoke that poses health risks**, especially when homes, cars, and other materials burn. This smoke can be more toxic than other air pollutants.
- **Air quality can change quickly.** Reduce your exposure while the fire is active and until smoke warnings have been lifted.

How do I know how bad the smoke is near me?

- **Use smoke-related air quality information, like the *EPA AirNow Fire and Smoke* Map (https://fire.airnow.gov/), which provides rapid smoke information.** This map provides rapid smoke readings (AQI PM2.5) that regular general weather app air quality readings don't capture. Also note that most air quality monitors measure only some pollutants and don't capture everything burning during a fire, so it's best to protect yourself from smoke as much as possible due to harmful contaminants.

What can I do to protect myself and others?

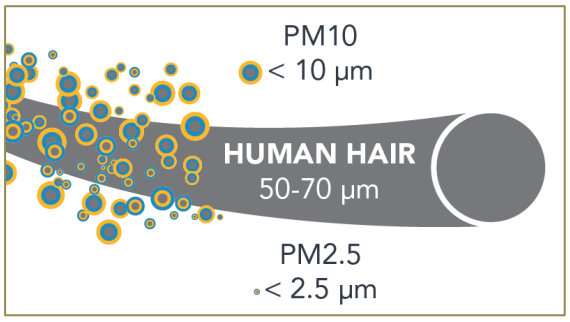
- **During the fire:** Leave the smoke area if possible to reduce your risk of harmful exposures. If you can't leave, stay indoors, close windows and doors, use air purifiers, and reduce indoor pollution (e.g., gas appliances, cleaning products).
- **After the fire:** When air quality improves, air out your home, avoid dry sweeping, wet-wipe surfaces, use PPE and/or professional cleaning services if ash/shoot is present.

How smoke travels in our bodies and affects our health

Wildfires that reach urban areas create harmful smoke from burning homes, cars, and toxic materials, making it more harmful than other air pollution. **Smoke contains a mix of gases and small particles (particulate matter, or PM).** These smaller particles and gases bypass many defense systems, traveling further into our bodies, even past the lungs into our blood, heart, and brain.

Our bodies' defenses include tiny hairs and mucus (or boogers!), that regularly help trap and clear particles from the air in our respiratory system. But the small particles in smoke are harder for the body to capture and clear.

Particulate matter (PM) is much smaller than a human hair and invisible, but when we breathe it in, it affects our health.



Key point!

Harmful smoke particles can travel deep into our lungs and body, affecting our health.

Image (top): the California Air Resources Board
Image (bottom): https://www.freudenberg-filter.com/en/company/why-filtration/

How can I check the smoke levels in my area?

The Air Quality Index (AQI) in weather apps is useful for everyday pollution but doesn't update quickly for wildfire smoke, and it does not capture everything found in wildfire smoke. One pollutant the AQI measures is $PM_{2.5,}$ which measures the amount, or concentration, of tiny particles in the air, but not what those particles are made of. $PM_{2.5}$ is the best overall indicator of smoke levels, and some agencies use a wildfire-specific **$PM_{2.5}$ AQI** to communicate smoke-related health risks. During fires, use sources with rapid PM 2.5 AQI readings, such as EPA's map:

- ☑ **EPA Air Now - Fire & Smoke Map:** https://fire.airnow.gov/
- ☑ **California Air Resources Board Smoke Spotter App:** https://ww2.arb.ca.gov/resources/fact-sheets/california-smoke-spotter/
- ☒ **Don't rely on the AQI found on your phone's weather app, which often can't measure rapid changes in smoke**

What is a healthy AQI or $PM_{2.5}$ level?

AQI or **$PM_{2.5}$ AQI**	**Health Rating**	**What to do:** Sensitive groups include people with health conditions, pregnant people, older adults, and young children.
0-50	GOOD	Play outside!
51-100	MODERATE	Consider slowing down and spending less time outdoors for sensitive groups.
101-150	UNHEALTHY FOR SENSITIVE GROUPS	Sensitive groups, such as children, should limit or reduce intense outdoor activities. Consider calm indoor activities. If necessary, carry an inhaler.
151-200	UNHEALTHY	Limit all outdoor activity.
201-300	VERY UNHEALTHY	Eliminate outdoor activity. Everyone's health risk is higher.
301-500	HAZARDOUS	Avoid outdoor activity.

Key point!

- **During fires, check smoke levels using sources above instead of the regular air quality numbers found on weather apps.**
- Protect yourself from smoke even if the air looks clear, because the AQI and the $PM_{2.5}$ AQI don't measure many smoke contaminants.
- If you see different numbers, pick the highest one to stay safe!

AQI or $PM_{2.5}$ AQI scale from: https://www.airnow.gov/publications/air-quality-index/technical-assistance-document-for-reporting-the-daily-aqi/

Smoke can change the air quality quickly and can travel very far:
Los Angeles 2025 Fires

2025 LA Fires

Air quality can change drastically during wind and fires. Continue to check the resources listed on page 5 for updated air quality.

Santa Monica: January 9, 2025	
Time	EPA AirNow Fire and Smoke Map PM2.5 AQI
2 AM	**47 (Good)**
7 AM	**210 (Very Unhealthy)**
12 PM	**150 (Unhealthy for sensitive groups)**
5 PM	**95 (Moderate)**
Typical levels	**12-38 (Good)** on average

For example, after the 2025 Palisades fires started on January 7th, Santa Monica's air quality changed drastically hour by hour on January 9th as the fires spread, reaching unhealthy and hazardous levels. Air quality did not return to typical levels until January 12th (see smoke plume image below).

Wildfire smoke can travel far! The figure below shows Los Angeles County and the smoke plume bringing unhealthy air quality to areas hours away from the fire.

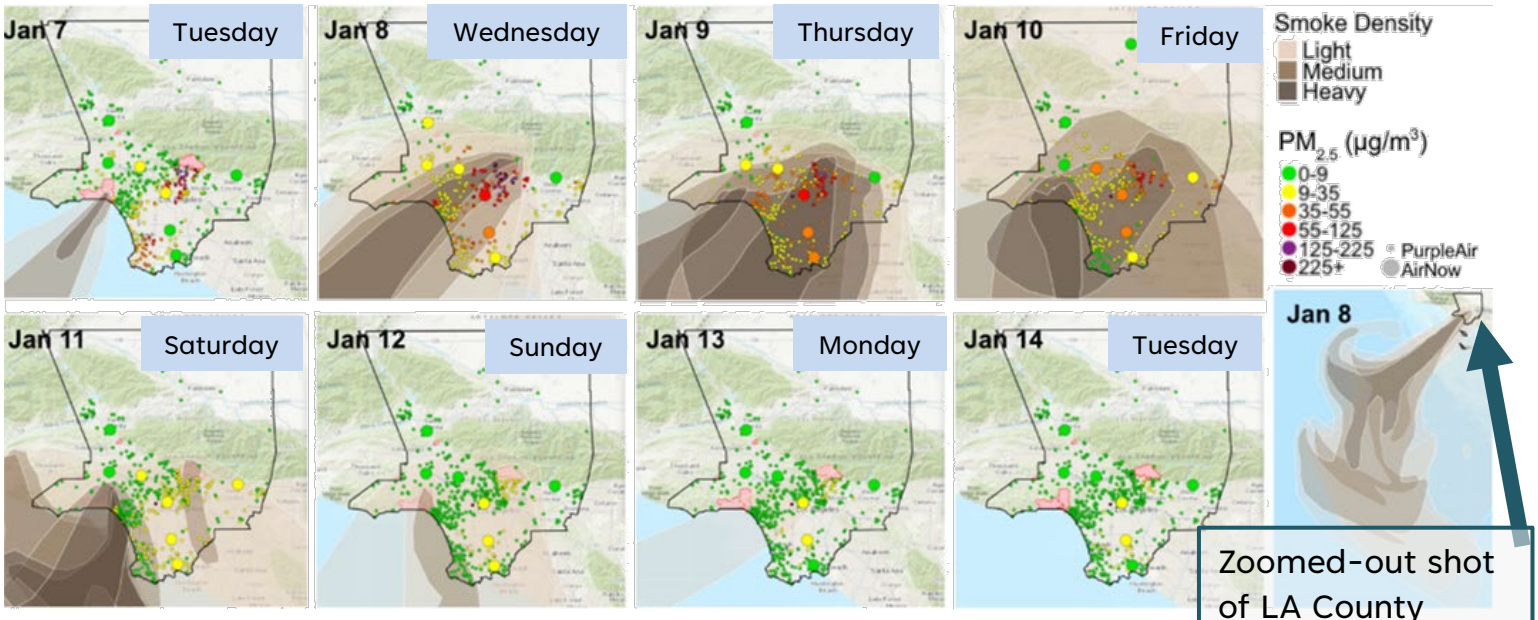
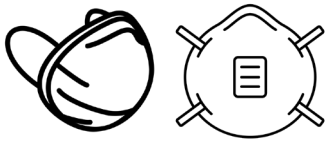
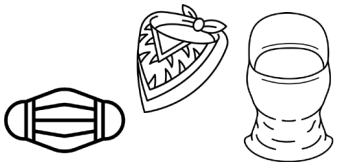


Image (bottom): Schollaert C, Connolly R, Cushing L, Jerrett M, Liu T, Marlier M. Air quality impacts of the January 2025 Los Angeles wildfires: Insights from public data sources.

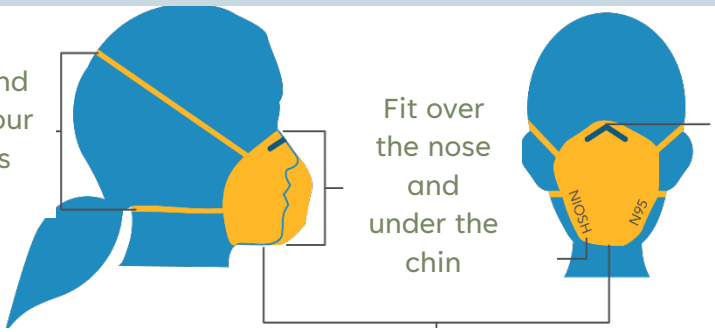
Choosing the right mask for wildfire smoke exposure and clean-up activities

MOST PROTECTION	GOOD PROTECTION	OK	NOT RECOMMENDED
			
P100 Elastomeric /reusable	**N95**	**KN95**	Medical mask, cloth covering, bandana, or no mask
Reusable, but expensive and heavy to wear.	Affordable, more comfortable (especially with an exhale valve), and disposable. Requires an airtight face seal to work well. Replace with new mask after multiple wears.	Affordable, comfortable, and disposable. Requires an airtight face seal to work well. *Available in children's sizes.*	Not enough protection.
Use these options for spending time outdoors during smoke or when handling fire debris. See handout C for PPE to wear on the rest of your body for fire debris.		In general, these masks have not been shown to be effective against small smoke particles, dust, and toxic fire contaminants, and may create a false sense of safety.	

How to wear respirator masks correctly for your safety:

Use *NIOSH-approved P100 or N95 masks for the best protection against wildfire smoke.
Respirators are not designed for children or for those with facial hair.

Place one strap above your ears and one strap below your ears. Do not cross the straps.



Fit over the nose and under the chin

Pinch bar over the bridge of your nose

The respirator mask should collapse against your face as you breathe in and should not leak air in from the sides

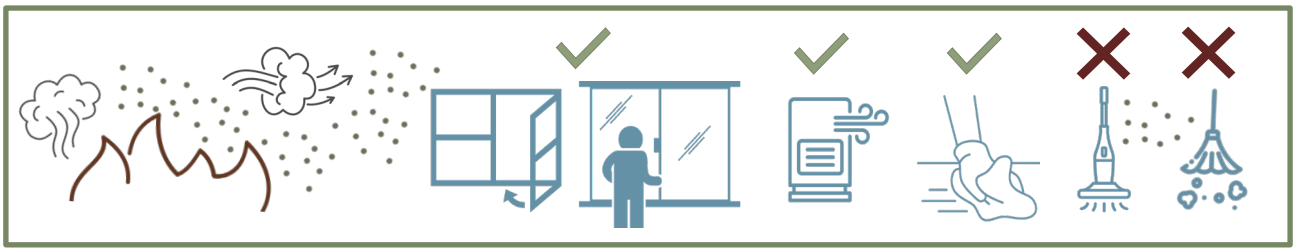
Look for the NIOSH (*National Institute for Occupational Safety and Health)-approved label for certified protection

Note: No masks work effectively with facial hair (like beards), as it prevents a proper seal on the face and allows smoky air to enter.

EPA Mask Information: https://www.epa.gov/sites/default/files/2018-11/documents/respiratory_protection-no-niosh-5081.pdf
Bottom figure: https://ww2.arb.ca.gov/news/california-battles-wildfires-officials-outline-how-protect-yourself-and-your-family-damaging

How to reduce smoke getting indoors

My home has:	Do:	Don't:
No central A/C or heat	✓ **Do:** close windows, doors, or vents. If the smoke is heavy, consider tightly sealing your chimney with a flue stopper or inflatable blocker. ✓ **Do:** use a HEPA air purifier, especially in bedrooms of children, older adults, or people with health conditions. *You can make an air purifier! See pg. 10*	× **Don't:** run systems that will pull in smoke, such as window air conditioning units, attic house fans, or swamp coolers
Central air conditioning or heat: Commonly called an HVAC, or heating, ventilation, and air conditioning system	✓ **Do:** Close windows, doors, or vents. If the smoke is bad, consider sealing your chimney tightly with a flue stopper or inflatable blocker. ✓ **Do:** Check the HVAC unit for filters and upgrade to MERV-13 if possible, as HEPA filters create too much resistance for most central HVAC units. ✓ **Do:** Run the HVAC system in recirculate mode while it is smoky outside, so outside air is not brought in. ✓ **Do:** Replace air filters once the smoke is over. Then run your HVAC system using outside air (not recirculate mode) to vent your home.	× **Don't:** replace air filters daily. They become more effective as they load with particulate.



For all homes:

Reduce indoor air pollution: Don't track dust and dirt into the house or car from outside. Clean feet of pets to avoid tracking in contaminants. Keep car air filters up to date. Eliminate other sources of indoor air pollution by reducing use of gas appliances, candles, air fresheners, fragrances, cleaning products, and other chemicals.

Reduce dust disturbance: Don't kick up any settled dust where smoke contaminants have settled on indoor surfaces. Avoid sweeping or dusting. Use HEPA-filtered vacuums. Wet wipe with soap and water while wearing PPE and/or hiring a professional remediation company can help reduce dust exposure risks (for cleaning after fires, see Handout C and masks to wear on page 7).

- EPA guide to air cleaners https://www.epa.gov/indoor-air-quality-iaq/guide-air-cleaners-home#:~:text=To%20filter%20particles%2C%20choose%20a,particulate%20air%20(HEPA)%20filter.
- *LA Fire Health Study Data Brief 5: Levels of VOCs in Indoor and Outdoor Air Before, During, and After Fires: lafirehealth.org/wp-content/uploads/2025/04/040425-LA-Fire-HEALTH-Data-Brief-5-FINAL.pdf*
- *South Coast AQMD.* 2025 Wildfire Response. https://www.aqmd.gov/2025-wildfire-response
- Goftari E, et al. Post-Wildfire Indoor Pollution in WUI Areas following the 2025 Los Angeles Fires. Part I. Establishing Baseline Contaminant Levels Prior to Home Reoccupation. ACS EST Air. 2025 Dec 19;3(1):142-155.

Learning Activity:

Match each activity on the left (A-E) to the best types of smoke protection on the right (1-6). Discuss what may not work for some people, or strategies that may not be an option in your situation.

You can choose more than one way to protect yourself!

ACTIVITY

A. Teaching kids in a classroom while there is an active wildfire nearby.

B. Exercising outside during a nearby wildfire

C. Working from home while there is a wildfire nearby

D. Cleaning a home affected by smoke and ash *after* a fire

E. Visiting a burned site, sifting through ash and looking for sentimental items.

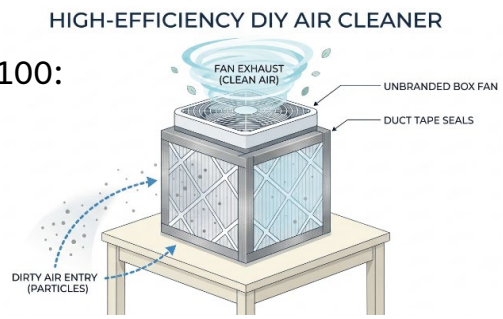
WAYS TO PROTECT YOURSELF AND OTHERS

1. Stay indoors, close doors and windows 
2. Use or make an air purifier 
3. Wear a NIOSH-approved P100 respirator mask 
4. Wear a NIOSH-approved mask, goggles, gloves, boots, and a Tyvek suit 
5. Check HVAC to make sure it isn't bringing in more smoke (turn it off, change filters, or if it needs to be on, use a setting to recirculate indoor air) 
6. Avoid heavy exercise and instead choose calm indoor activities like reading, playing games, art, yoga, tai chi, or stretching. 

Good practices include:
A: 1, 2, 6
B: 1, 6
C: 1, 2, 5, 6
D: 3, 4
E: 3, 4

Tips, resources, and further reading

- ✓ **Stay indoors and reduce smoke exposure during wildfires.**
- ✓ **Use indoor air purifiers!**
  - How to make your own air purifier for less than $100: https://corsirosenthalfoundation.org/instructions/
  - Filter type should be MERV13 or higher



- ✓ **Make sure that your air conditioning (A/C) or HVAC system is not bringing smoke indoors.** See page 8.
- ✓ **Leave shoes outside to reduce the amount of dust and ash brought indoors.**
- ✓ **Create a "clean air room"** for vulnerable individuals, such as babies, young children, and those with health conditions. Choose an interior room away from doors or outdoor drafts, keep it sealed, and use an air purifier/filtration system to block out smoke, ash, soot, and dust.
  - https://ehsc.oregonstate.edu/our-research/research-highlights/wildfire-smoke-and-infant-health or
  - https://www.epa.gov/emergencies-iaq/create-clean-room-protect-indoor-air-quality-during-wildfire
- ✓ **Clean surfaces using wet wipes or soap and water.** Avoid brooms or dusters to keep from stirring up dust. Use a HEPA-filtered vacuum. See booklet C for more post-fire cleaning tips.
- ✓ **When air quality returns to healthy levels, consider airing out and cleaning your home if you live near the fires.**
  - https://lafirehealth.org/faq/#ventilate
- ✓ **If you experience medical symptoms, seek medical care. Have medications on hand.**
- ✓ **Eating a healthy diet reduces the absorption of heavy metals that can be present in smoke.** Eat your fruits and vegetables!