

## Wildfires, Human Health and Preparedness

California is no stranger to wildfires, which have been historically thought of as uncontrolled fires that typically burn wildland vegetation in forests, grasslands, and other ecosystems (*Wildfires*, 2022). They have occurred over millions of years and are essential to the survival of certain plant and animal species and keeping ecosystems healthy. Wildfires have significantly increased in intensity and damage caused over the past two decades (*Statistics | CAL FIRE*, 2022; US EPA, 2016). While the reasons for this increase are complex and include climate change, natural climate cycles, land use and fire suppression practices; humans are responsible for the majority of the initial ignition of wildfires (in contrast to natural elements such as lightning) (US EPA, 2016).

With current trends, wildfires can have significant impacts on human life and health (Durrwachter-Erno & Patel, 2022).

1. Immediate health effects are more prominent in the vicinity of the wildfire, though health effects can be seen in distant locations downwind from wildfires.
2. Main pathological pathways are through the production of reactive oxygen compounds and toxic chemicals leading to oxidative stress and chronic inflammation (Chen et al., 2017; Kelly, 2003).
3. Health effects include upper and lower respiratory tract symptoms, asthma exacerbations, cardiac events, neurocognitive effects and cancer in children and adults (Holm et al., 2021). Lastly, one cannot forget the trauma and toxic stress that wildfires cause due to vast destruction and their mental health effects.
4. Vulnerable populations include pregnant women, young children and those with preexisting health conditions.

The causes and effects of wildfires might seem daunting, but there are effective steps you can take for yourself, your patients, and your practice. The key is in being prepared. Below are some resources that may be helpful, referenced from trusted sources.

### Tips to help you, your patients and families

- Air Quality Index (AQI): During and immediately after a wildfire, one of the most important things you want to do is check the air quality. You can do that on websites such as <https://www.airnow.gov/>. AQI higher than 150 is considered unhealthy and 300 is considered hazardous to humans.
- Individual protection: Face masks can be used as short-term measures to reduce the exposure to wildfire smoke. Consider investing in an appropriately fitted NIOSH N95 mask (Western States PEHSU, 2021).
- Living spaces: Keep one room designated as a “clean room” and maintain good air quality in that room. It should be large enough to house all the members of the household. Prevent contamination of indoor air by maintaining good filtration. One way of doing this is making



sure you have a good filter (MERV ≥13) for the HVAC system of your house. You could also consider investing in a portable, non-ozone producing HEPA filter. Keep windows closed and minimize activities like cooking that might increase indoor air pollution.

- Mental health services: Being aware of the mental health needs of your patients, particularly after a traumatic event like wildfires, can help you best guide them on their road to recovery.

#### Tips for preparedness of your clinic

- Preparedness for potential evacuation: Maintain an emergency kit and develop an emergency preparedness plan for your clinic. Be aware of evacuation alerts through mobile alerts, websites, or the news.
- Evacuation order checklist: Things can change very rapidly in the event of a wildfire. Maintaining and referring to an Evacuation order checklist for the office can be very useful in the time of an emergency (University of California Cooperative Extension, Fire in California, 2023).

#### Tips as a concerned citizen

- Environmental advocacy: As physicians, we are a trusted voice for our community and should advocate for bills that protect our environment and health.
- Vote: Vote for candidates who have a track record of protecting our environment and health. Improve your community's voting access by obtaining "Get Out the Vote Tools" from the AAP, and/or keeping voter registration forms in your office (*Election 2022, 2023*, p. 202).
- Reduce your energy consumption: Think about ways to reduce your office energy consumption, e.g., turning off computers and switching to energy-efficient lighting. Did you know? 100-500 trees need to be planted to offset the effect of 1 computer left on for 24 hours a day.



#### Additional Resources

- Western States Pediatric Environmental Health Unit:
  - <https://wspehsu.ucsf.edu/projects/wildfires-and-childrens-health-2/>
  - [https://wspehsu.ucsf.edu/wp-content/uploads/SoH\\_Sofia\\_WildfireHealthEffects\\_TrainingModule.pdf](https://wspehsu.ucsf.edu/wp-content/uploads/SoH_Sofia_WildfireHealthEffects_TrainingModule.pdf)
- California Air Resources Board:  
<https://ww2.arb.ca.gov/list-carb-certified-air-cleaning-devices>
- Cal Fire: <https://www.fire.ca.gov/prepare>
- Environmental Protection Agency:
  - <https://www.epa.gov/climate-indicators/climate-change-indicators-wildfires>
  - <https://www.epa.gov/indoor-air-quality-iaq/create-clean-room-protect-indoor-air-quality-during-wildfire>
- AirNow: <https://www.airnow.gov/wildfires/>

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Durrwachter-Erno, K., & Patel, L. (2022, August). Climate Change & Wildfires: Why Kids Are Most at Risk. HealthyChildren.Org.

<https://www.healthychildren.org/English/safety-prevention/at-home/Pages/climate-change-has-sparked-more-wildfires-why-kids-are-most-at-risk.aspx>

*Election 2022: Vote Kids.* (2023). <https://www.aap.org/en/advocacy/election-vote-kids/>

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[https://wspehsu.ucsf.edu/wp-content/uploads/SoH\\_Sofia\\_WildfireHealthEffects\\_TrainingModule.pdf](https://wspehsu.ucsf.edu/wp-content/uploads/SoH_Sofia_WildfireHealthEffects_TrainingModule.pdf)

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