

Wildfire Matters Review Committee August 29, 2023

- Scott Bookman, Senior Director of Public Health Readiness and Response
- Kristy Richardson, State Toxicologist
- Kristen Good, Health Equity Deputy Branch Chief



Responding to Wildfires

Changing climate and environmental conditions



- Increasing frequency and magnitude of wildfires in CO
- Longer active wildfire season (year round risk)
- Record breaking wildfire severity in size and damage over the past decade

Increasing frequency and magnitude throughout Western US & Canada



- Long-range smoke resulting in air and water pollution impacts on CO residents
- Greater impacts on chronic illness and mental, respiratory, and cardiovascular health

Colorado's growing population



- Growth of populations living at wildland-urban interfaces
- More CO residents impacted than in the past



Responding to Wildfires

The State's approach to wildfires:
EMERGENCY RESPONSE and **SAFETY** first,
then **LONG-TERM HEALTH** and **RECOVERY**.

CDPHE roles include:

- Emergency preparedness and response for active wildfire risks
- Recovery from wildfires for impacted communities



Health Concerns From Wildfires

Impacts depend on:

- Weather
- Location
- People



Source: Nasa/SSAI, 7 June 2023

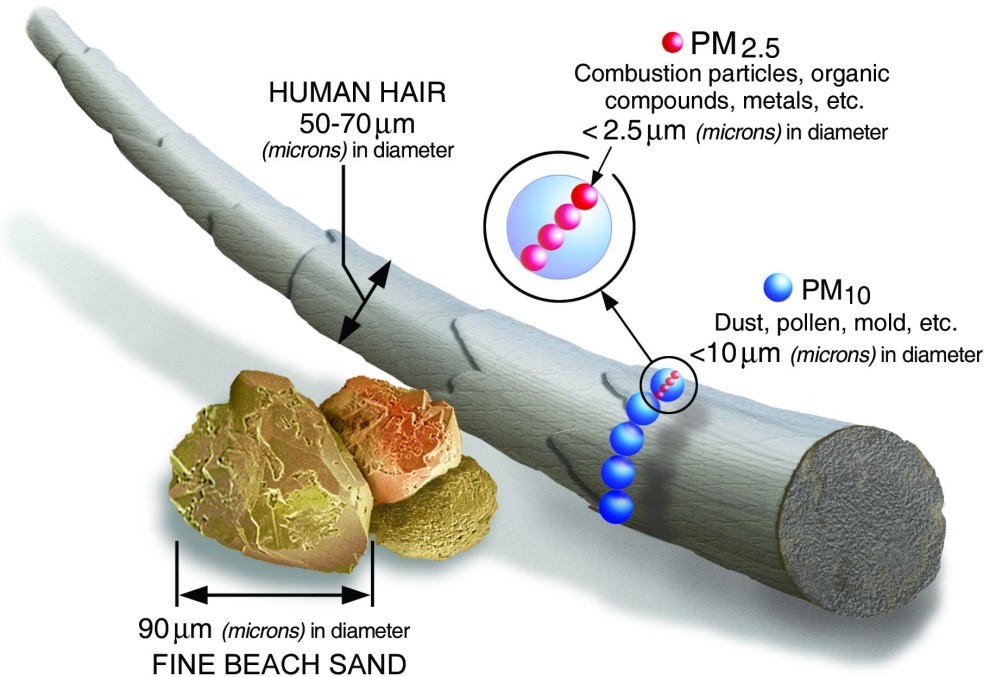


COLORADO
Department of Public
Health & Environment

Health Concerns From Wildfires - Air

Wildfire smoke can:

- Irritate eyes, nose, and throat.
- Cause wheezing, coughing, and difficulty breathing.
- Worsen asthma, bronchitis, and other lung diseases.
- Increase the risk of heart attack, heart failure, stroke, and premature death.
- Impact mental health.



Health Concerns From Wildfires - Water

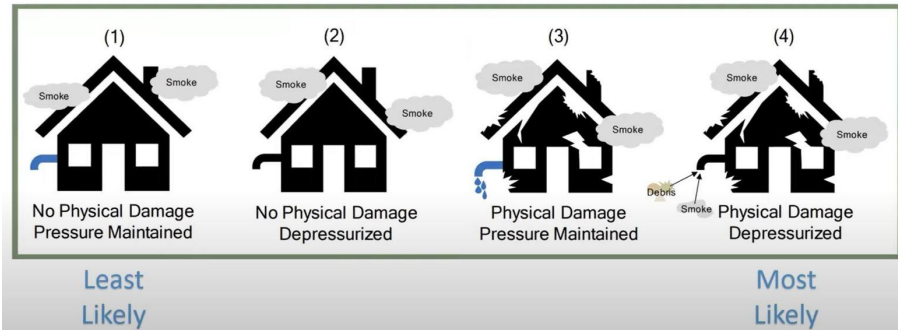
Pressure loss and fire-damaged infrastructure:

- Bacterial contamination
- Volatile organic compounds (VOC's)
- Backflow into distribution system
- Extreme water loss → impede/endanger firefighters

Long term impacts on watersheds:

- Lack of vegetation and hydrophobic soil → increased runoff, mudslides, erosion
- Long term color/taste/odor issues

*Certain conditions likely increase
the possibility of chemical contamination*



Vulnerable Populations

- People with underlying health conditions.
- Children and older adults.
- Pregnant people.
- People who work outside.
- People with less access to health care.
- People who face barriers accessing resources to respond and recover.



Understanding Health Impacts and Intervening

Protect your health on smoky days.

- ✓ Stay indoors when you can.
- ✓ Check the air quality in your area before going outdoors.
- ✓ Wear an N95 respirator outdoors.
- ✓ Set fans and air conditioners to recirculate - even in your car.



- Informing decisions through:
 - Air quality alerts and boil, bottle, or do not drink advisories
 - Water sampling
 - Websites
 - Fact sheets
 - Social media tool kits
- Supporting Local Public Health Agencies



Indoor Air Quality Impacts

wildfires → outdoor air pollution → indoor air pollution

- Conventional advice during wildfire events: stay indoors, close windows/doors
- Our buildings are not “airtight”: ambient air pollution infiltrates buildings, and can get trapped within a confined indoor environment
 - Closed-up buildings trap/recirculate pollutants generated from indoor sources as well, rather than effectively ventilate those pollutants out
 - Under typical conditions, indoor air quality can be considerably worse than outdoor air quality

Indoor air quality may be *better* than outdoor during wildfire events, but it’s not necessarily *good*.

Case Study Example: CDPHE Health Equity IAQ/V Pilot Program: During facility assessments occurring during May 2023 Canadian wildfire smoke events, we found that indoor PM_{2.5} was up to 100x higher than typical and 2-3x higher than EPA health-based recommendation threshold.



COLORADO
Department of Public
Health & Environment

Indoor Air Quality Impacts

Interventions to improve indoor air quality/reduce exposure to indoor air pollution exist, but, there are barriers to feasibility to implement in all situations.

- **Keep windows/doors closed**
- **Manipulation of central HVAC systems in mechanically-ventilated spaces**
 - Recirculate - limit outdoor air intake
 - Highest-quality filters (MERV13+, HEPA)
 - 24/7 circulation (not just active heat/cooling)
 - Addition of supplemental portable air cleaners
- **Physical infrastructure upgrades to reduce leakiness of building** (e.g., replace old windows, doors, plumbing/electric / add leak-seal barriers)
- **Use N95s, indoors**
- **Reduce indoor sources/other sources of air pollution that contribute to cumulative impacts**
 - Discourage use of wood-burning stoves for heating/cooking; gas stoves/heating appliances may also pollute indoor air
 - Encourage proper ventilation - use of kitchen vent/fans, well-ventilated heating/cooling systems
 - Discourage use of spray cleaners, air fresheners, candles
 - Education around pollutant-generating hobbies/activities & reducing exposures



Clean(er) Air Shelters: A community-level solution?

Public-access facilities that provide reprieve from poor air quality

- Ideally, indoor air quality is *measured/monitored* and *managed* in the space to ensure it is *good*, and not just assumed to be better than ambient air quality or indoor air quality at personal residences
- Individual communities need to develop plans for operation of Clean Air Shelters
 - What are the community's needs (short-term, long-term, who would use)?
 - Available year-round, seasonally, or activated during specific incidents?
 - What spaces are suitable/available to meet that need?
 - What steps/tools/education is needed to manage the space?

DCPHR Health Equity Branch Indoor Air Quality Team recently received an “intent to fund” notice from US EPA’s [Wildfire Smoke Preparedness in Community Buildings Grant](#): 3-yr effort to support communities in education/training that would facilitate development of plans for Community Cleaner Air Shelters



Indoor Air Quality Standards and Building Infrastructure

There are currently no regulatory standards that apply to indoor air pollutants.

Some best practice guidance is available from national agencies -

- [ASHRAE](#) provides guidance for best practices around building HVAC management
- [EPA](#) provides scientific information about pollutant levels and health impacts
- [OSHA](#) provides some limited occupational setting guidelines for [ventilation](#) and specific [pollutants](#) and [scenarios](#)
- [CDC](#) provides guidance for ventilation in [homes](#), [buildings](#), [schools](#) from respiratory disease control perspective - which can sometimes counter wildfire smoke control best practice.

CDPHE's Health Equity Branch Indoor Air Quality/Ventilation Assessment Pilot Program has funding through May 2024 to help facility owners/managers navigate and implement best practices.



Indoor Air Quality Standards and Building Infrastructure

Building infrastructure in CO (homes, workplaces, public buildings) is largely outdated.

- Leaky buildings allow high level of infiltration, poorly ventilated
- Many structures lack HVAC systems that are capable of adequately filtering air pollutants, particularly of the type and size fraction seen during wildfire events.
 - DCPHR Health Equity Indoor Air Quality/Ventilation Pilot Program has found that majority of facilities involved in our program had no, or only partial, central HVAC system.
 - Those with HVAC systems overwhelmingly had mechanical issues needing attention, lack ability to modify settings on-demand to respond to poor air quality events, and do not have capacity to handle filters higher than MERV-8.
 - *Context: MERV-8 removes 20% of particles sized 1-3 um, ineffective for smaller particles → MERV-13 removes 50% of 0.3-1 um and 85% of 1-3um size; HEPA removes 99%+ across all sizes*



Disproportionately Impacted Communities

Wildfires pose health risks for everyone in Colorado.

But, some individuals and communities are more likely than others to face barriers to accessing resources to prepare, respond, protect, and recover - which can make the risks result in worse impacts.

Some communities, populations, and individuals:

- a) Are more likely to face barriers to accessing preparedness resources and education
Examples: language challenges to understanding information; economic, social limitations to implementing best practices
- b) May be more vulnerable or susceptible to adverse outcomes due to a variety of social, economic, and environmental factors that exacerbate the impact of wildfires
Examples: pre-existing medical conditions; lack access to healthcare; other pollutant exposures
- c) Are more likely to face barriers to recovery, resulting in longer-lasting impacts post-fire event
Examples: housing displacement for renters vs owners / housing affordability; access to relief services/funds limited by language, community engagement challenges



Disproportionately Impacted Communities

CDPHE is committed to environmental justice and health equity in all our work.

This means that we prioritize disproportionately impacted communities in our efforts related to protecting public health and the environment, and we seek to address and counteract health disparities that exist among communities due to social determinants of health.

A few examples specific to wildfire response:

- All air quality alerts and advisories are available in [English](#) and [Spanish](#) on the CDPHE website.
 - During specific incidents (e.g., Marshall Fire), the [Environmental Justice Program's](#) in-house translators are able to support real-time/crisis needs and translations of public health advisories.
- Office of Emergency Preparedness and Response [Disaster Behavioral Health team](#) coordinates planning efforts and provides just-in-time support during emergencies with a focus on assisting individuals with [Access and Functional Needs](#).
- [Health Facilities and Emergency Medical Services Division](#) supports residential care facilities in preparing for, and meeting vulnerable population needs during wildfire emergencies.

