

Wildfires, Smoke, & Our Health

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2026 Wildfires

What we know

- More than 4.5 million hectares have burned across Canada this year
- Nearly 600 wildfires are still active currently

Our health

is inseparable from

our environment

Millions of people exposed to wildfire smoke

Wildfires are A direct health hazard

- Harms associated with flame exposure: burns, inhalational injuries, physical injury, heat stroke
- Destruction of personal, commercial, public property
- Disruption in health care, social services
- Evacuation & displacement from families & communities





Wildfire

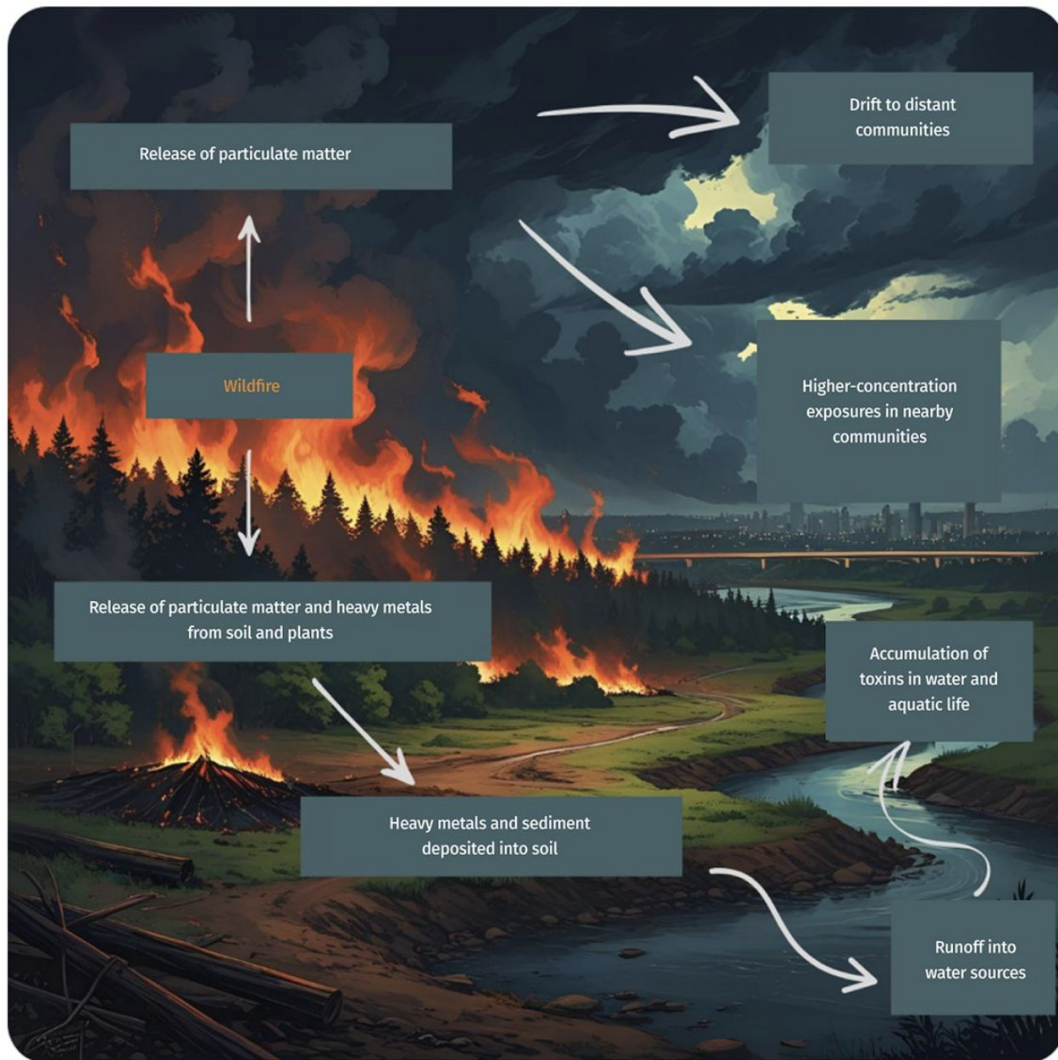
smoke

Is a health hazard

- Particulate matter (PM 2.5)
- ground level ozone
- carbon monoxide
- nitrogen dioxide
- sulphur dioxide
- Microplastics
- heavy metals

No safe

Level of exposure



Wildfire

smoke

Is a health hazard

- Milder symptoms: headaches, throat and nose irritation, cough, and eye irritation
- More serious symptoms: dizziness, chest pain, severe cough, shortness of breath, wheezing, and heart palpitations



Xu NEJM 2020
Fadadu JAMA 2024
Pacey CFP 2026



Short-term risks

- Increased all-cause mortality
- Increased cardiovascular mortality
- Increased acute myocardial infarction, stroke, and heart failure
- Increased asthma hospitalization and emergency department use, COPD exacerbations
- Worsens diabetes control & kidney disease with increased ER visits
- In pregnant people: increased risk of preterm birth, gestational diabetes, hypertension in pregnancy, low birth weight



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2023 wildfires

- interrupted time-series/case-crossover analysis of two June 2023 smoke episodes in Ontario
 - daily asthma-related ED visits peaked at a 23.6% increase (95% CI 13.2%–34.9%) at a 1-day lag, sustained up to a 5-day lag
 - post hoc effects of ~40% higher in children and ~48% higher in adults
- Modeled analysis of deaths attributable to the 2023 Canadian wildfires
 - 5400 acute & 82,100 chronic deaths globally
 - 1300 acute & 8300 chronic deaths in Canada



Chen CMAJ 2025
Zhang Nature 2025

Long-term risks

- reduced lung capacity
- increased risk of dementia
- higher incidence of lung cancer and brain tumors
- serious mental health impacts, including anxiety, depression, substance use, and PTSD
- Increased risk of autism spectrum disorder in children



Xu NEJM 2020
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Wildfire impacts: higher-risk groups

A quick reference to identify patients at higher-risk of wildfire impacts.

☐	Underlying medical conditions	Persons with severe or chronic underlying illness, including cardiovascular, respiratory, and mental health disorders. Also consider those with limited self-care, mobility, or communication ability
☐	Older age	Reduced physiological resiliency for responding to smoke, heat, and other exposures. More likely to have underlying health problems
☐	Social and cultural groups	Indigenous peoples and groups living in remote settings and who depend on the land and community for well-being. Groups that are physically, logistically, or linguistically separated from information and services
☐	Pregnancy	Persons who are pregnant, plan to or may become pregnant, or who have given birth during wildfire events
☐	Children	Children who are younger than 5 years old, who have underlying respiratory conditions, or who have close exposure to wildfire events or evacuation
☐	Outdoor work and recreation	People who work primarily outside, and may include first responders, wildland firefighters, labourers, farmers, and others. Wildland firefighters are a priority group due to their repeated close exposure to pollutants and occupational traumas. Persons who exercise outside for recreation also have increased exposure
☐	Unhoused or underhoused	May include unhoused and underhoused persons, those in housing without adequate ventilation, or those unable to avoid smoke and heat exposure
☐	Limited social connection or resources	Limited social connection, separation from community during evacuation, low income or loss of income





Wildfire smoke and children

- Breathe faster, lungs are larger relative to body size
- Smaller airways, more easily blocked by particles & inflammation
- spend more time outdoors
- breathe air closer to the ground where pollutant concentrations are higher
- Lungs are still developing: toxic exposures can cause long-term structural damage
- Risk of asthma, upper respiratory tract infections, mental health impacts



What can we do?

- Monitor the AQHI
- Stay inside if the AQHI is high or if you are at risk and the AQHI is moderate
- Use portable HEPA air purifiers or build a Corsi-Rosenthal box
- MERV 13 filter or better on your furnace or air conditioner & turn the fan on
- Use a well-fitted N95 mask





What can we do?

- Workplace protections
- Fire resistant building codes
- Improve indoor air: home filtration subsidies, air quality standards for schools & health care facilities
- National firefighting strategy
- Implement and renew the National Adaptation Strategy (does not include wildfires!)





Treat climate change as a health issue

Canada must meet its legally binding climate targets (currently planning to fail)

- Stop building pipelines
- Stop fracking & LNG
- Uphold clean electricity regulations
- build out a clean, connected, Canada-wide electricity grid
- Strengthen carbon pricing
- Strengthen methane abatement policy

ecojustice

