

The Limits of Livability

The emerging threat of smoke impacts on health from forest fires and climate change

In 2019, extensive forest fires in the Amazon followed by the worst bushfires in Australia in living memory, fires which raged for five months, sparked international concern. Both devastating events took place to a backdrop of wildfires recorded around the world in 2019 and 2020.

Forest fires in the Amazon are deliberate, driven by land clearing for intensive agriculture and ranching, and contribute to climate change by releasing forest carbon stores. The extreme fires witnessed recently in temperate forests around the world are, in part, fuelled by climate change. The risk of wildfires is projected to increase as climate change intensifies.

Whether a climate change driver, or a consequence of global warming, forest fires now cause episodes of extremely poor air quality that can affect very large populations. In Australia, for example, 80% of the population were affected by smoke pollution in the 2019/2020 fires.

Forest fire smoke contains a range of pollutants including particulate matter, carbon dioxide, nitrogen oxides and volatile organic compounds. It may pollute domestic water tanks and waterways with ash and particulates, as can the fire retardant dropped by planes and helicopters.

Health impacts increase in step with incremental increases in air pollution and are seen especially in children, the elderly and those with existing chronic medical conditions. People who spend more time

outdoors are more vulnerable, along with older people over 65, people with asthma, chronic obstructive pulmonary disease (COPD) and cardiovascular disease. Modest rises in pollution levels can have major population health impacts if enough people are exposed or the smoke persists for a long time.

Short-term impacts from wildfire smoke include coughing and shortness of breath. Wildfire smoke is a trigger for asthma presentations and is associated with an increase in emergency hospital attendance after short-term exposure and particularly for children. Recent studies have found associations with ambulance callouts for respiratory, cardiovascular and diabetic problems. The impact of wildfire smoke on health can be tracked through changes in the number of commonly used pharmaceuticals dispensed to treat respiratory conditions, for example, salbutamol used for relieving asthma symptoms.

Studies have linked exposure to air pollutants to adverse pregnancy outcomes including low birth-weight. A recent study of exposure to particulate pollution during wildfire seasons in British Columbia indicated that impacts on respiratory and cardiovascular health were observable within one hour of exposure to PM2.5 and an impact on diabetes outcomes were seen over time. Large cohort studies are currently underway in Canada and Australia investigating the impacts of forest fire smoke pollution on birth outcomes.



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While there is good evidence of the short term impacts of forest fire smoke the long term impacts are not yet known. This report reviews the existing evidence on the health impacts of forest fire smoke. Three case studies — focussing on forest fires in Canada in 2018 and the 2019-2020 bushfires in Australia (both in part climate-driven), as well as the land-clearing fires in the Amazonian rainforest in Brazil in 2019 — illustrate the impacts on health and health services of prolonged forest fire events. Interviews were carried out with health professionals and Indigenous people in Canada, Australia and Brazil who experienced the forest fire episodes described.

In the Canadian provinces of British Columbia (BC) and Alberta, 2018 was the worst fire season on record, following record-breaking fires in 2017 when a 10 week state of emergency was declared. Smoke from the fire spread across Canada. It burned 1.3 million hectares, and the Interior Health Authority had to close 19 sites, evacuating 880 patients and displacing over 700 medical and health staff at a cost of \$2.2 million US dollars.

The Australian bushfires of 2019/2020 were unprecedented.. Air quality was ten times hazardous levels in state capital cities. Maximum PM2.5 levels in Canberra, Australia's capital were recorded at 2,496 µg/m³ during the week of Jan 5-11 and prescriptions for inhalers for shortness of breath increased by 73%. The unprecedented ferocity of the fire and persistence of smoke for weeks and months, were described by all those interviewed.

Approximately 27 million people live in the Amazon basin and some 10 million of these live in areas of poor air quality. In the devastating fires of August 2019, health impacts included increased cases of respiratory problems, particularly among children.

Studies from the Amazon basin show that particulate matter from forest burning is associated with low birth weight, increased risk of respiratory disease among children and elderly people and higher rates of outpatient, emergency room visits and hospital admissions, alongside decreased lung function.

Recommendations:


Preparation, adaptation, and mitigation are needed to protect people's health from the smoke impacts of worsening wildfires and forest fires. Key recommendations:

- **Forest protection and management:** Adopt an immediate moratorium on man-made land clearing fires in the Amazon and other applicable regions. Improve fire management practices, including by working with and learning from Indigenous fire managers.
- **Health risk mitigation and adaptation:** Prepare communities and government agencies for effective wildfire and smoke response. (See guides available, e.g., in Australia and the US.) Fire evacuation plans must be refreshed and kept up-to-date and, critically, communicated to residents.
- **Health impact data collection and research:** Study the long term impacts of exposure to forest fire smoke on health and on health services.
- **Global climate action:** Recognise increasing extreme forest fire events as another stark warning of the impacts and health threats of climate change. Align climate mitigation commitments with the Paris Agreement target of limiting global warming to 1.5°C. Measures that strengthen health, wellbeing, and healthcare systems in the near term while meeting climate mitigation targets should be prioritized.

To read the full report, find supporting materials, and report details, go to:
<https://climateandhealthalliance.org/forest-fire-smoke-health-climate/>

About GCHA

The Global Climate and Health Alliance (GCHA) is the leading global convenor of health professional and health civil society organizations addressing climate change. We are a consortium of health and development organisations from around the world united by a shared vision of an equitable, sustainable future, in which the health impacts of climate change are minimized, and the health benefits of climate solutions are maximised. GCHA works to elevate the influential voice of the health community in policy making to address the climate crisis.

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