

Feedback loop means bushfire health impacts likely to be more severe with climate change

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Immediate actions are needed to limit the greenhouse gas emissions that are driving climate change that helps fuel wildfires, a Monash University study says.

A special report published in the *New England Journal of Medicine*, led by Professor Yuming Guo and Dr. Shanshan Li from the Monash School of Public Health and Preventive Medicine, summarizes the enormous impacts of [climate change](#) on wildfire seasons and the sequential increased morbidity, mortality, and mental health impacts.

The report, which analyzed numerous studies on wildfires over the past 20 years, says [global climate change](#) is fueling the three essential conditions for wildfires—fuel, oxygen and an ignition source. The world is seeing inconsistent rainfall, increased drought and hotter temperatures, leading to more flammable vegetation.

It says the global mean carbon dioxide (CO₂) emissions from wildfires accounted for about 22 percent of the carbon emission from burning fossil fuels between 1997-2016. The inconsistent approach to global forest management and the conversion of tropical savannas to [agricultural lands](#) is damaging the world's ability to absorb CO₂ and cool the climate.

The report says projections suggest that if high [greenhouse gas emissions](#) continue, wildfire exposure could substantially increase to over 74 percent of the global land mass by the end of the century.

However, if immediate climate mitigation efforts are taken to limit the global mean temperature increase to 2.0°C or 1.5°C, a corresponding 60 percent and 80 percent, respective increase in wildfire exposure could be avoided, the report says.

Reaching the 1.5°C target would require reducing global net CO₂ emissions by about 45 percent from 2010 levels by 2030 and reaching net zero around 2050. The 1.5°C target remains achievable if CO₂ emissions decline by 7.6 percent per year from 2020 to 2030.

The report says the devastating health impacts are illustrated by several large and—in some cases—unprecedented recent wildfires. These include the 2019-2020 Australian wildfires, the 2019 and 2020 Amazon fires in Brazil, the 2018 and 2020 wildfires in the western US, the 2017-2018 wildfires in British Columbia, Canada, and the ongoing record-breaking wildfires on the US West Coast.

Along with the increased eye irritation, corneal abrasions and respiratory impacts of the smoke, the [psychological effects](#) are equally as serious with post-traumatic stress disorder (PTSD), depression, and insomnia common. The psychological consequences of wildfire events can persist for years, with children and adolescents particularly vulnerable.

A [20-year study](#) on adults exposed to an Australian bushfire disaster as children in 1983 found an increase in psychiatric morbidity in adulthood, with [wildfire](#) events associated with subsequent reductions in children's academic performance.

The report says the current exchange between wildfires and [climate](#) change is likely to form a reinforcing feedback loop, making wildfires and their health consequences increasingly severe, unless we can come together to reduce greenhouse gas emissions.

More information: Rongbin Xu et al. Wildfires, Global Climate Change, and Human Health, *New England Journal of Medicine* (2020). [DOI: 10.1056/NEJMsr2028985](https://doi.org/10.1056/NEJMsr2028985)

Provided by Monash University

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