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## ARTICLE

# The Bushfires Downunder – A Medical Emergency, Now and Later

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## ARTICLE INFORMATION

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## ABSTRACT

Although Australia is accustomed to bushfires on a regular basis the extremity of the latest episode was unprecedented causing worldwide concern for the people and ecosystems of the country. This article describes the causes of bushfires alongside the environmental impacts. It reflects on the heroic manner in which the Australian peoples rallied together to overcome their adversity, concluding on lessons to be learned for future generations.

An unprecedented catastrophe was created by the uncontrolled bushfires in Australia. Between September 2019 until January 2020 an estimated 19 million hectares of land and 6000 buildings were burnt, killing at least 40 people and about 1.25 billion animals, driving some endangered species to possible extinction, including Australia's famous Koala bear, with the mammoth blaze destroying 30% of their habitat.<sup>1</sup> The estimated cost of the 2019 Bushfire is likely to exceed the \$4 billion cost of the 2009 Black Saturday fire. State of emergency was declared in various parts of the country with the Australian government pledging \$50 millions for fire affected wildlife.

Bushfires are a necessary part of the life cycle for several trees and plants such as Eucalyptus in Australia.<sup>2,3</sup> Loose flammable bark and combustible oil in their leaves may promote the spread of fire. Although bushfires are an integral part of the Australian environment, these fires were more extreme than ever known before. The horrific wildfires were clearly visible from satellites images, the smoke rising at least 17 km high and moving approximately 11 000 km across the South Pacific Ocean. NASA estimated emissions of 306 million tones of carbon dioxide. As a result, in some areas, air quality exceeded twenty times the hazardous rating.

A possible cause for these devastating fires is climate change which may have brought forward the start of bushfire

season and delayed its finish. The tragic loss of lives and properties and the destructive impact on the environment has raised serious concerns in every section of the community.<sup>4</sup> Tourism sector revenues have fallen by more than a billion dollars. The fires have undermined Australia's reputation in the international higher education market to the tune of \$38 billion.

## HEALTH EFFECTS

The medical community has taken on its emergency care role, but also worked to understand the far reaching consequences of these fires on human health. The immediate focus on diseases resulting from contaminated water and food and disease secondary to extreme air pollution became a public health priority. There was increased sediment concentration in drinking water in the run off areas with lead in excess of current drinking water guidelines. The bushfires followed by heavy rains have washed ash alongside other particulate matter into rivers turning the water silt black and killing the fish. Although bushfire smoke affects health, its full unprecedented impact both in the short and long term needs further exploration.<sup>5</sup> There was a 51% increase in ambulance calls for breathing difficulties due to smoke and a 25% increase in exacerbation of asthma and COPD since November last year.<sup>6</sup> Prolonged



exposure to high levels of toxic particles and carcinogens also raise the fear of a spike in lung cancer in the next decade and beyond. WHO estimated that ambient air pollution contributes to 4.2 million premature deaths globally each year. In Australia, atmospheric PM (particulate matter) 2.5 contributed to 2800 premature deaths (2% of all deaths) in 2016. A recent study in China concluded that long term exposure to high concentration of ultra fine particle of PM 2.5 (air quality measure) found in bushfire smoke are linked to stroke in relation to the dose of exposure.<sup>7</sup>

The Australian medical community and government agencies set up Breath Easy Clinics. More emergency consultations were created both in person and through video conferencing in bushfire affected regions working in coordination with first responders such as police officers, firefighters, paramedics and The Australian Defence Force. Mental health conditions like depression, anxiety and post traumatic stress disorder were acknowledged by funding extra sessions of mental health consultations. The profound health effects highlighted the need for future planning. At the outset allocating \$5 million in research grants to investigate the long term impact on physical and mental health.

An Australian study conducted during the 2009 Black Saturday disaster, illustrated the physiological stress firefighters experienced in hot, smoky and physically demanding conditions unleashing an inflammatory response that puts the individuals at risk of poor health with repeated exposure. It has been implicated as a predictor of arterial disease and myocardial infarction. The researchers found their inflammatory changes consistent with 'overstrained athletes'.<sup>8</sup>

The projected lifetime adversities are likely to include mental health issues, risky/high level alcohol consumption, non communicable diseases, family violence and environmental damage. The main impact seems to be delayed when people have a chance to stop and reflect on their experiences.<sup>9</sup> A prospective study of 1526 people who suffered losses in 1983 Ash Wednesday bushfire found that after 12 months 42% were defined as suffering from psychiatric illness or psychiatric symptoms using General Health Questionnaire, about double the expected community prevalence. Fortunately, after 2 years half of these numbers showed human resilience and improved. Strong recommendations were made to introduce disaster management in the medical curriculum to prepare generations of doctors for increased climate events culminating in public health emergencies.

The generosity of ordinary people was commendable digging deep in their pockets from all walks of life. Australian Indians in their usual spirit of selfless service donated nearly half a million dollars in addition to front line services such as food vans. There were many fundraising events bringing solidarity amongst all Australians. Sydney attracted 70 000 people to

support the performance of local and international stars raising well over \$50 million.

## THE FUTURE

This experience has most definitely left no room for complacency. The effects of climate change specific to Australia are recognised and include: significant linear association between exposure to high temperature and greater mortality in large cities of Sydney, Melbourne and Brisbane. Estimated annual productivity losses from heat stress of \$616 per employed person in Australia. 2177 reported deaths from extreme weather conditions in the past 100 years. An observed 13.7% increase in dengue carrying mosquitos to transmit disease to humans in Australia between 1950 and 2016.

Australian Medical Association joined other organizations around the world including British and American Medical Associations along with Doctors for the Environment Australia, in recognizing climate change as a health emergency.<sup>3</sup> It has called on Australian Government:

- *To adopt mitigation target within Australian carbon budget.*
- *To promote health benefits of addressing climate change.*
- *To develop national strategies for health and climate change.*
- *To promote an active transition from fossil fuel to renewable energy.*
- *To establish a National Sustainable Development Unit to decrease carbon emission in health care sector.*

Last month, the board of a public hospital in New South Wales rejected a \$15 million donation from a coal mining venture, saying the project's potentially negative effects on the local population's health made it unethical. The board's decision should be widely and loudly applauded especially at a time when Australia is grappling with its worst-ever bushfire season that has come at the hands of climate change. Medical Journal of Australia has recently stated: "Heat exposure is more lethal than any other natural disaster in Australia".<sup>10</sup>

The aftermath of bushfire is likely to be considerable with long standing impacts on the built and natural environment. Rebuilding life both individually and nationally, will be a mammoth task. There is a proud history of health professionals standing up on issues of importance. Asbestos, smoking and climate change are some of those which will now occupy the minds of Australian researchers and people around the world. The February miracle rain of 350mm in some parts of Australia has finally helped to bring the blaze under control. As all the emergency warning are being downgraded people are gradually returning home for yet another phase of grief, sifting through their fire damaged properties.

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