

Australia: Toxic air from bushfires rated a “public health emergency”

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A statement authored by 22 health and medical organisations has labelled the levels of air pollution caused by bushfires in the states of New South Wales (NSW) and Queensland in recent weeks, a “public health emergency.” The bushfire smoke in Australia in the eastern region has reached record levels of polluted air in bushfire affected areas and neighbouring towns and cities.

The statement declared: “Governments have a responsibility to protect the people they represent.” The health bodies are among the leading independent agencies in Australia for respiratory health, including the Thoracic Society of Australia and New Zealand, the Australian Lung Foundation and the Australian College for Emergency Medicine.

The group called on the federal and state governments to prioritise action to reduce health risks from bushfire smoke. “We call on Prime Minister Scott Morrison and NSW Premier Gladys Berejiklian to demonstrate the leadership this public health emergency demands and to implement measures to help alleviate the health and climate crisis,” it stated.

In addition, a group known as Doctors for the Environment have also described the very high levels of pollution as an “unprecedented public health threat.” On December 10, the Sydney air quality index, a measure of air pollution, was 11 times higher than that considered “hazardous.” This resulted in 234 presentations to emergency departments with asthma and breathing problems, almost double the average number of 130.

It is the fifth week that paramedics and emergency departments have had an increase in the numbers of patients with respiratory problems. In one week alone, between December 5 and 11 there was a more than 30 percent increase in presentations to emergency departments for asthma and breathing difficulties and 40 percent increase in calls to NSW Ambulance for the same conditions.

Dr Richard Yin of Doctors for the Environment said that his group had significant concerns that exposure of these high levels of pollutions may have longer term medical effects in the millions of people exposed.

Poor air quality has long been recognised in numerous population studies to be detrimental to human health and to lead to premature deaths. The World Health Organisation (WHO) recognises an estimated 4.2 million premature deaths globally are linked to ambient air pollution. It is the fine particulate matter in polluted air—extremely small particles micrometres in diameter—that are known to be associated with the negative impacts of air pollution. During a bushfire, these particles can reach very high concentrations in the ambient air.

The particulate matter can penetrate the lungs and smaller particles can penetrate the blood stream, which can have detrimental impact on both lungs and the cardiovascular circulation. The smallest measured particles are known as PM2.5s, representing particles 2.5 micrometers in size or about 3 percent of the diameter of a human hair.

In one of the most comprehensive worldwide epidemiological studies known as the Global Burden of Disease (GBD) study, data from 2017, published last year in the *Lancet* medical journal, demonstrated that long term exposure to PM2.5 was considered to be a leading risk of global disease burden. The study, which examined trends from 1990 to the present, demonstrated exposure to these particles increased risks of lower respiratory infections, ischemic heart disease, chronic obstructive pulmonary disease, lung cancer, and diabetes mellitus.

The Australian Broadcasting Corporation (ABC) reported earlier this month that in the Greater Sydney area over the past five years, the Air Quality Index (AQI) that measures PM2.5s recorded only five events where the maximum measured on a given day was an AQI of 100, indicating poor air quality. In November and December

this year there have already been 80 days reaching this level, with one quarter of these days reaching an AQI above 200.

On the worst day of this period to date in Sydney, the AQI reached 669 which is the equivalent to smoking 30 cigarettes a day.

Professor Mark Taylor from Macquarie University, who researches environmental pollution and risks to human health, told the *Sydney Morning Herald* that bushfire smoke has complex chemistry, which can be carcinogenic even at low concentrations. “Exposure to particles has a cumulative effect over a lifetime and even if the impact of short-term exposure is minuscule, multiple exposures to high levels of pollutants will have an effect,” he said.

Australasian College for Emergency Medicine president Dr John Bonning said that the heat waves associated with bushfires are also a serious threat to health. “Heatwaves can also lead to increased presentations for conditions such as heatstroke, cardiac events and mental health issues,” he said. “This disproportionately affects some of our most vulnerable patients, including the elderly and children. It is also an equity issue, as people without insulated homes, or who are unable to afford air conditioning, are at increased risk.”

Senior fellow at the Centre for Air Pollution, Energy and Health Research at the University of NSW, Dr Christine Cowie, told the ABC that breathing in high amounts of fine particles could affect physical development. “It is uncertain how medium-term exposure to these sporadic bushfire pollutions events impact on long-term health,” she said. “However, we do know that current evidence indicates there is no safe lower threshold of exposure to [particulate matter] pollution.”

Dr Cowie also said there was concern about the most vulnerable members of the community. “Certainly, people who are repeatedly exposed to high levels [of air pollutants] and if they’re children for instance or elderly, it’s likely to impact on their lung function.”

While studies were underway, there is limited research into what this exposure can do on a large population in a major city. “No one can say definitively what happens after a two-month exposure to those high levels, other than if you’re susceptible, you’re likely to have increased respiratory problems,” she said.

Professor Francesca Dominici of Harvard University in the US is the senior author of a study which revealed that short term exposure to fine particles in pollution can impact a wider range of medical conditions beyond lung

and cardiovascular disease.

Dominici told the ABC Health report: “Even though we don’t know yet all of the clinical pathways that could have led to this disease [lung disease], we do know that inhalation of fine particulate matter penetrates deep into the lung and initiates a series of inflammations that could simultaneously affect multiple organs.”

The study’s authors say the comprehensive analysis provides timely evidence for the upcoming revision of the WHO air quality guidelines.

This latest evidence is among a large body of data that demonstrates air pollution is significantly detrimental to human health.

The catastrophic bushfires have been burning since August from one side of Australia to the other, some four months earlier than the normal fire season. They have killed eight people, destroyed more than 700 homes and burned through more than two million hectares of land.

The fires have exposed the criminal negligence of governments, state and federal, Coalition and Labor alike. These governments have for decades presided over budget cuts to firefighting services which now almost entirely relies on volunteers and have watched as entire towns in remote and rural areas run out of water making it increasingly impossible not just to fight the fires but to inhabit the towns at all. Like governments around the world, none of those in Australia has seriously addressed climate change that is exacerbating the prevalence of fires.

These same governments have ignored the warnings of the health and medical professions and the increasingly strident concerns of fire fighters.

Currently emergency departments struggle to keep up with existing demand and are poorly equipped to handle dramatically rising numbers of patients impacted by the negative health effects of bush fires, let alone the long term consequences of poor air quality.



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