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COMMENTARY

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Impact of recent catastrophic bushfires on people with asthma in Australia: health, social and financial burdens

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The impact of bushfire, particularly on those with chronic lung diseases, is now recognised (1, 2). Individuals with asthma are among the most vulnerable groups (3). As bushfires are anticipated to be longer and more intense in many regions of the world, their adverse impact, particularly in asthmatics, will impose a significant burden.

Between July 2019 and March 2020, Australia experienced an unprecedented number of bushfires. At its worst the smoke resulted in the Air Quality Index reaching more than 25 times the hazardous level in Canberra on the 1st of January 2020. It is estimated the bushfire smoke was responsible for more than 400 deaths, 2,000 respiratory hospitalisations and 1,300 presentations to the Emergency Department (ED) for asthma (4).

In response to the unfolding public health emergency caused by this prolonged period of bushfire, Asthma Australia conducted an online survey (19th December 2019 to 30th January 2020) to capture the experiences of people across Australia. The survey was posted on the Asthma Australia website, and disseminated via Asthma Australia networks, social media and media articles, including an email to Asthma Australia's database of approximately 60,00 people with asthma or their carers. It included both quantitative and qualitative questions.

The survey was completed by 12,152 people of which 7285 (61%) reported a history of doctor-diagnosed asthma (5). People with asthma were particularly vulnerable to the impacts of smoke exposure, with 93.6% experiencing respiratory symptoms compared to 70.2% in those without asthma (Figure 1). People with asthma were significantly more likely to report seeking medical assistance (23.3 %) and being sick more than a week (33.0%) than those without asthma (13.3% and 19.9% respectively). Notably, people with asthma reported significantly higher rates of serious health outcomes including attending the Emergency Department (5.9 %), hospitalisation (2.4 %) and requiring corticosteroid medication (16.3 %) compared to those without asthma (1.4%, 0.6%, and 2.4% respectively). These outcomes were reported despite people with asthma being significantly more likely to take actions to reduce smoke exposure (e.g. staying inside with doors and windows shut-85.7%; using air conditioning on the recycled setting-55.1%; using a portable HEPA air cleaner in small, enclosed areas of a house-12.3%; and using a P2/N95 face mask-28.7%) than those without asthma (72.4%, 43.3%, 8.9% and 22.8% respectively). Children with asthma were disproportionately impacted by the smoke exposure. Carers were more likely to report their child attended the Emergency Department or was admitted to hospital as a result of smoke exposure.

The survey also found sustained exposure to bushfire smoke had significant impact on the quality of life in people with asthma. Those with asthma reported significantly reduced capacity in daily activities (65.6% in asthmatics vs 47.4% in those without asthma), social engagement (e.g. needed to cancel important sporting/social engagement, 35.4% in asthmatics vs 23.7% in those without asthma), and being absent from work/school (29.4% in asthmatics vs 14.8% in those without asthma). People with asthma were twice as likely to experience financial stress (24.9%) compared to people without asthma (12.9%). This was due to lost or reduced income, and additional costs from extra doctors visits, additional medication and the costs of protective equipment.

One particular aim of the survey was to understand if actions taken by people with asthma during the bushfire period helped to reduce the adverse impact of smoke exposure. Despite their efforts, people with asthma who reported taking action to minimise smoke exposure both before and during bushfire season, were still more likely to report respiratory symptoms, require medical attention (GP visits, ED visits, hospital admission and requiring steroid medication) and experience negative impacts on their quality of life (e.g. sick for >1week, financial stress, absent from work/school, restricted daily activities and social engagement) than those with asthma who did not take action. This is unexpected and may be related to asthma severity. Among people with asthma, those who reported taking their preventer medication daily, were also more likely to report taking protective actions to reduce smoke exposure. It is possible these people had more severe asthma and therefore were more at risk of adverse respiratory outcomes during hazardous smoke exposure. Additionally, the smoke was present for unprecedented periods at hazardous levels, and often out of the individuals control to minimise or avoid exposure completely despite taking protective actions.

The survey findings reveal the substantial acute impact of the bushfire crisis on people with asthma. Importantly, it is likely that these catastrophic fires will have long-term health effects (2). Exposure to woodsmoke may cause long-lasting lung and airway injuries and contribute to the progression to irreversible airflow limitation(6).

The findings highlight the need for effective primary and secondary preventative measures in people with asthma. Monitoring for long-term respiratory consequences is essential to quantify and qualify the extent of the impact and use this information to explore preventive measures. Public health programs to increase awareness and preparedness for bushfires should be strengthened. Appropriate allocation of healthcare resources for respiratory care, the availability of additional services such as smoke pollution warning, and advice on preventive measures before and during bushfire seasons are also warranted.

In addition to preventative measures specifically for people with asthma, the impact of bushfires in this survey and others (7) on people with and without asthma highlights the need for holistic national strategies to prevent and mitigate the adverse impact of bushfires. Timely and effective risk communication and education targeting environmental health literacy is needed. Authorities should improve the air quality monitoring network, including a better distribution, consistency across state borders on risk thresholds and use of temporary air quality stations where necessary. Long-term surveillance of affected communities for adverse health impacts and appropriate allocation of health care resources is also essential to support both the acute phase and mitigate the long-term impact. National policies including control of prescribed burning are needed, as are strategies to ameliorate the factors contributing to the increase in frequency and severity of catastrophic bushfires, namely, global warming.

Lessons learned from the 2019/20 bushfire crisis and these recommendations could benefit both Australia and other countries.

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FIGURE LEGEND

Figure 1. The impact of bushfires and uptake of preventive measures to reduce smoke exposure. All comparisons between people with or without asthma are significant (all p-values <0.05).