

Submission
No 46

**INQUIRY INTO HEALTH IMPACTS OF EXPOSURE TO
POOR LEVELS OF AIR QUALITY RESULTING FROM
BUSHFIRES AND DROUGHT**

Organisation: Asthma Australia

Date Received: 9 April 2020

Legislative Council Portfolio Committee No. 2 – Health

Inquiry into the health impacts of exposure to poor levels of air quality resulting from bushfires and drought

Submission by Asthma Australia

Summary

Asthma Australia’s submission to the NSW inquiry into the health impacts of exposure to poor levels of air quality resulting from bushfires and drought seeks to represent the needs and experiences of people with asthma so that they are better protected from catastrophic events in the future.

Our submission addresses the terms of reference most relevant to people with asthma and centres around five policy priority areas:

- Improve the collection of data and undertaken research on the short and long-term health impacts of poor air quality, particularly for children
- Manage the adverse health impacts of poor air quality through targeted support, particularly for people who are at greater risk, including people with asthma
- Provide timely and appropriate information on air quality, including approaches to reduce the risk of adverse health impacts from exposure to poor air quality
- Improve hazard reduction burning practices to minimise health impacts
- Take action to address climate change to reduce the frequency and severity of catastrophic bushfires and associated hazardous air quality

Summary of recommendations

1	<i>New South Wales work with the Australian Institute of Health and Welfare (AIHW) and other jurisdictions to develop models for improved data collection in hospitals and other health settings to adequately and promptly enable capture of data relevant to crises, such as bushfires.</i>
2	<i>The New South Wales Chief Health Officer work with the Chief Medical Officer and State and Territory counterparts to develop a national policy framework to guide institutional responses relating to air quality protection.</i>
3	<i>The Meeting of Environment Ministers develop a uniform approach to measuring and reporting air quality including:</i> <ul style="list-style-type: none">• <i>Separating out PM2.5 in reporting of air quality data;</i>• <i>Requiring PM2.5 be reported as an hourly average;</i>• <i>Using consistent terminology and measures to describe categories of air quality; and</i>• <i>Introducing strong compliance and enforcement mechanisms to prevent non-compliance.</i>
4	<i>Department of Planning Industry introduce more air quality testing stations (including in regional, rural and remote areas) and consider the use of temporary air quality stations in further locations during extended periods of poor and hazardous air quality.</i>

5	<p><i>Provide funding to government and non-government health agencies for health education measures to reduce the risk of adverse health impacts of poor air quality, including:</i></p> <ul style="list-style-type: none"> <i>• year-round information to improve environmental health literacy for people</i> <i>• targeted information for people with asthma on actions to take to prepare for such events</i> <i>• increased crisis response for periods of sustained poor air quality, such as during bushfires</i>
6	<i>The NSW government provide support to people with asthma towards the costs associated with using air purifiers with a HEPA filter to avoid asthma flare ups.</i>
7	<i>NSW Health ensure that appropriate protective equipment (such as P2 masks) is stockpiled and a strategy for distribution is developed to ensure people in areas affected by poor and hazardous air quality in a timely manner, particularly to people who are in high risk groups.</i>
8	<i>NSW Health develop clear guidelines on how to protect children from exposure to poor and hazardous air, in the absence of P2 masks being effective for them.</i>
9	<p><i>The NSW Rural Fire Service and State Emergency Services should:</i></p> <ul style="list-style-type: none"> <i>• Include health authorities and a consumer representative in planning for burning so that health impacts are considered;</i> <i>• Coordinate activities with health authorities so that health messages can be provided to the community ahead of the planned burn to ensure that the potential for adverse health impacts is minimised; and</i> <i>• Where possible, stagger burns and ensure they do not result in prolonged periods of poor and hazardous air quality.</i>
10	<i>The NSW Government take action to mitigate climate change and the associated weather conditions causing longer bushfire seasons and sustained periods of poor and hazardous air quality.</i>

Introduction

We all want to live in communities where we are healthy and well. However, during the past Spring and Summer, we saw unprecedented levels of poor air quality across New South Wales (NSW). In Sydney alone, there were 81 days of poor, very poor and hazardous air quality over 2019, which is higher than the combined total of the ten years prior to this.ⁱ

Bushfires emit airborne particles or particulate matter. Suspended fine particulate matter or PM2.5 are tiny particles that can penetrate deep into the lungs and can cross over into the blood stream. People who have respiratory conditions such as asthma, women who are pregnant, children, older people and people with cardiovascular disease are particularly vulnerable to the negative impacts of exposure.ⁱⁱ The longer-term health impacts of sustained poor air quality include respiratory illnesses, some cancers and heart disease.ⁱⁱⁱ

People with asthma are particularly vulnerable to bushfire smoke. In NSW, 11% of people aged 16 and over, and 21% of children aged between 2 to 15 have asthma. Asthma can be a life-threatening condition and resulted in 165 deaths and 10,880 hospitalisations in NSW in 2017.^{iv}

Nationally, more than 2.7 million Australians have asthma. During the 2019-20 bushfire period, Asthma Australia surveyed more than 12,000 Australians and found that 94% of respondents with asthma experienced symptoms as a result of the bushfire smoke.^v

The full health impacts of poor and hazardous air quality on health outcomes are not known. This is due to current limitations with measuring and reporting adverse health impacts of bushfire smoke and limited research on the health impact of sustained bushfire smoke.

The unprecedented nature of the 2019-20 bushfires and the resulting number of poor or hazardous air quality days in New South Wales demonstrates the need for the Government to be better prepared and Asthma Australia welcomes the Committee's interest in this issue.

Terms of Reference 1: The health impacts of exposure to poor levels of air quality resulting from bushfires and drought including:

(a) the impact of at-risk groups including children, pregnant women, people with asthma and other respiratory-related illnesses, the elderly and other high-risk groups as well as vulnerable companion animals;

Policy priority: Improve the collection of data and undertake research on the short and long-term health impacts of poor air quality, particularly for children

It can be difficult to identify the health impacts of sustained exposure to poor and hazardous air quality because they may be delayed or seem unrelated to the exposure. For these reasons data collected by health services, including hospitals and general practitioners, may not record exposure to bushfire smoke as a factor in the presentation of the person to the service. Likewise, exposure to smoke may not be revealed as a cause of death on a death certificate.

There is limited research into the health impacts of prolonged exposure to poor and hazardous air quality resulting from bushfires. Historically, bushfire events have typically been brief, therefore research has focused on short term exposure.^{vi} At the population level, it is difficult to determine the differences in effects of different particles.

One piece of research that focused on long term effects is a longitudinal study examining the impacts of exposure to six weeks of smoke from the 2014 Hazelwood coal mine fires. The results indicated that more than a year after the fire, adults had increased rates of respiratory symptoms and children who were exposed in the womb or up to the age of two had increased respiratory tract infections and increased lung stiffness.^{vii}

There is strong public health concern about exposure to particulate matter because there is no evidence of a safe level of exposure to PM2.5 or PM10. Research on particulate matter exposure is generally from regions which experience high levels of pollution because of traffic or causes other than bushfires. For example, a recent study from China found that long term exposure to PM2.5 at high concentrations is positively associated with the incidence of stroke.^{viii}

Policy response

Data collection, including data collection from NSW Health and state public health agencies needs to be improved to ensure that bushfire smoke is recorded as a cause of morbidity or mortality across the healthcare system. This will help us understand the impacts of bushfire smoke on short and long term health conditions.

The Australian Institute of Health and Welfare (AIHW) should be commissioned to investigate current practice when recording bushfire smoke in presentations to emergency departments and recording in other health data, such as the National Minimum Data Set. The report should also recommend ways to improve the collection of data to ensure that the true impacts of bushfire smoke are known and understood.

Recommendation 1

New South Wales work with the Australian Institute of Health and Welfare (AIHW) and other jurisdictions to develop models for improved data collection in hospitals and other health settings to adequately and promptly enable capture of data relevant to crises, such as bushfires.

Policy priority: Manage the adverse health impacts of poor air quality through targeted support, particularly for people who are at greater risk, including people with asthma

When periods of poor or hazardous air quality occur, certain people in the community are disproportionately impacted by the adverse health impacts. People who have respiratory conditions including asthma, pregnant women, infants and children, older people and people with cardiovascular disease and type 2 diabetes are particularly vulnerable to the negative impacts of exposure.^{ix}

For people with asthma, increased exposure to PM2.5 from bushfire smoke has been shown to have a greater association with worsening asthma symptoms than particulate matter from urban sources, such as vehicle emissions.^x

Asthma Australia’s survey during the December 2019 – January 2020 bushfires found that people with asthma reported taking a range of actions to manage or relieve symptoms caused by smoke from the bushfires. The table below provides an overview of these results.^{xi}

Actions taken by people with asthma to manage/relieve symptoms due to bushfire smoke	Numbers	Percentage (%)
Increased reliever inhaler	5,508	76
Increased existing preventer dose/frequency	3,011	41
Visit a GP	1,699	23
Steroids (oral or injection)	1,189	16
Administered asthma first aid	587	8
Was prescribed a preventer	522	7
Attended ED	431	6
Hospital admission	175	2

The Survey also identified other impacts for people with asthma including 66% of people having reduced capacity in their daily activities, 33% being sick for more than one week, 35% having to cancel an important sport or social engagement, 29% being absent from work or school, 25% experiencing financial stress and 10% losing salary.^{xii}

People who are particularly vulnerable to the adverse health impacts of poor and hazardous air quality require additional supports to ensure that they receive the help that they need to avoid health complications.

(b) the impact on people who are exposed to poor outdoor air quality in the workplace;

Policy priority: Provide timely and appropriate information on air quality, including approaches to reduce the risk of adverse health impacts from exposure to poor air quality

Timely institutional responses are needed to ensure that children and other members of the community are safe during periods of sustained poor air quality.

During the periods of sustained poor and hazardous air quality over the 2019-20 Spring and Summer, some agencies released policies providing guidelines for managing air quality. For example, ACT Education Directorate released a policy on 'Managing Air Quality in Schools'. The information included an 'Air Quality Impact and Response Guide for Schools' and a risk assessment framework. The information included actions that could be taken (eg remaining indoors, limiting physical activity and the cancellation of excursions).^{xiii}

It is important that policies are developed across institutions and these policies and guidelines are informed by evidence provided by a central health authority, such as the Federal Government Chief Medical Officer, so that it is consistent across states and territories. In January 2020, the Chief Medical Officer and State and Territory Chief Health Officers released brief 'guidance on health effects of exposure to bushfire smoke'.^{xiv} This statement provided high level information on the impacts of PM2.5 on people's health and possible actions to reduce these impacts. However, the statement was brief and should be built on to develop more detailed advice to guide institutional responses.

Workplaces have a responsibility to provide a safe working environment. Safe Work Australia provided information on 'Bushfires and air pollution' stating that 'workplaces must have measures in place to protect worker health and safety and manage risks.'^{xv} Safe Work Australia also specified that workplaces 'must have measures in place to manage the risks to health and safety when air quality is reduced' and outlined actions such as working inside, rescheduling outdoor work and providing personal protective equipment such as P2 face masks.^{xvi} For people with asthma who have a flare up due to the smoke, there is a need to have flexible policies in place that allow people to work from home at times when there are sustained periods of poor or hazardous air quality.

Additional resources also need to be made available to non-government health organisations during times of crisis, in order to bolster their operations in supporting communities as well as at-risk groups. During the 2019/2020 Bushfire Season, people with asthma and respiratory conditions were particularly at risk, and the organisations and agencies supporting them experienced an increased need for services and supports.

Recommendation 2

The New South Wales Chief Health Officer work with the Chief Medical Officer and State and Territory counterparts to develop a national policy framework to guide institutional responses relating to air quality protection.

Terms of Reference 2. The effectiveness of the NSW Government to plan for and improve air quality including:

(a) the measurement, reporting and public awareness;

(Policy priority: Provide timely and appropriate information on air quality, including approaches to reduce the risk of adverse health impacts from exposure to poor air quality – continued)

Measuring and reporting on air quality

Bushfire smoke emits airborne particles or particulate matter. Exposure to PM2.5 is of particular concern because the tiny particles can penetrate deep into the lungs and even the blood stream,^{xvi} causing adverse health impacts in the short and long-term.

The National Environment Protection Council (NEPC) identifies National Environment Protection Measures (NEPMs) and assesses and reports on these measures.^{xvii} NEPC established national ambient air quality standards, which include standards for particulate matter or PM10 and PM2.5.^{xviii} PM10 is 10 micrometers or less in diameter and PM2.5 is 2.5 micrometers or less in diameter.^{xix} NEPM also sets goals for not exceeding agreed maximum allowable exceedances of PM2.5. The current standard specifies that PM2.5 does not exceed 25 µg/m³ over a one day period and 8 µg/m³ over a one year period.

However, there are variations in the way in which jurisdictions report on air quality data, including:

- The interval at which air quality is reported (eg hourly average vs daily average);
- The terminology and thresholds used to describe the different categories of air quality (eg very good, good, fair, poor, very poor); and
- What is being measured (eg composite data for a number of pollutants vs a specific measure for PM2.5).

Official air quality monitoring stations are accredited by the National Association of Testing Authorities (NATA). There are variances between states in the number of locations that air quality data is collected. Air quality monitoring stations are in the major metropolitan areas and some regional centres.^{xx}

Policy response

The Meeting of Environment Ministers (MEM) comprises the Minister for the Environment from the federal government and the Environment Minister from each state and territory. The MEM provides a forum for Ministers to discuss the differences in air quality reporting and possible harmonization across states and territories. The MEM has the delegation to amend the NEPM and, according to the NEPC, “Ministers may decide to vary an existing NEPM or make a new one. Before this can happen, an extensive consultation process is undertaken.”^{xxi}

The MEM should direct the NEPC to review the standard that requires PM2.5 to be reported as a 24 hour average and move towards the requirement to measure and report air quality on an hourly average at a minimum to better reflect the air quality at a frequency relevant to the community/consumer. The MEM should also require other sources of air pollutants that are not currently reported as an hourly average to be standardised. This would result in all sources of air pollutants reported as an hourly average. This data can be used by the community to make decisions about avoiding poor and hazardous air quality.

There is a need for mechanisms to be in place to prevent non-compliance with air quality standards. Without strong compliance and enforcement mechanism, there is no incentive for Australian governments or polluters to minimise exposure to pollutants, such as PM2.5, which places the health of Australians at risk of potential short- and long-term adverse health impacts. Consistent communication relating to bushfire smoke across states and territories is important to ensure community members are provided standardised messages. A uniform approach to reporting on air quality is needed, so that different states and territories are not using different terminology and benchmarks for reporting on air quality.

There is also a need to increase the number of air quality measuring stations in NSW, particularly in rural and remote areas. Consideration should be given to increasing the number of portable stations at times when there are extended periods of poor and hazardous air quality, even if these stations are not used in national reporting and are only available temporarily. This will help to provide localised information about air quality to people in areas with greater vulnerability to air pollution.

Recommendation 3

The Meeting of Environment Ministers develop a uniform approach to measuring and reporting air quality including:

- *Separating out PM2.5 in reporting of air quality data;*
- *Requiring PM2.5 be reported as an hourly average;*
- *Using consistent terminology and measures to describe categories of air quality; and*
- *Introducing strong compliance and enforcement mechanisms to prevent non-compliance.*

Recommendation 4

Department of Planning Industry and the Environment introduce more air quality testing stations (including in regional, rural and remote areas) and consider the use of temporary air quality stations in further locations during extended periods of poor and hazardous air quality.

Providing health information and advice on air quality

In addition to the collection and reporting of air quality data, there are also inconsistencies in the health information provided to the community when air quality is poor or hazardous. While NSW and the ACT provide health information and advice alongside air quality data, other jurisdictions do not.

Where information was made available, the advice provided to the community included:

- Stay indoors with the windows and doors closed;
- Stay in large public spaces such as libraries and shopping centres;
- Use an indoor air cleaner or purifier with a high efficiency particle air (HEPA) filter;
- Wear a P2/N95 rated face mask;
- If you have an air conditioner, set it to recirculate;
- Reduce or avoid outdoor physical activity;
- Have access to regular medication;
- Seek medical attention if needed;
- Check in on neighbours; and
- Relocate to another area.

Asthma Australia's survey during the December 2019 – January 2020 bushfires found that respondents with asthma took many of these actions:

- Almost all (95%) reported they stayed inside with the doors and windows shut;
- 62% reported they used air conditioning on the recycled air setting;
- 47% reported they sought reprieve in buildings such as shopping centres and cinemas;
- 33% reported they used a face mask;
- 14% reported they used a portable HEPA air cleaner in small, sealed areas of a house; and
- 12% reported they relocated to a different area.^{xxiii}

Despite taking these actions, many people with asthma experienced adverse health impacts as a result of the bushfire smoke.

There are a number of limitations to the advice being provided, including:

- Questions highlighted in the media on the efficacy of the use of P2 masks in protecting people from pervasive bushfire smoke because their effectiveness depends on the facial fit of the mask.^{xxii}
- The health advice being provided is unsuitable for sustained periods of poor and hazardous air quality as people will need to leave their homes to attend school or work.^{xxiii}
- The health advice being provided often relies on a person's ability to read, understand and interpret air quality data being provided by state and territory governments. The ability for people to do this will vary considerably.
- There is no advice that refers to medical preventive strategies, specific risk predictions and advice targeted at specific at-risk groups in the community.

In addition to the advice being provided by state and territory governments, community members also look to institutions to have comprehensive policy responses relating to air quality. The Asthma Australia Bushfire Survey found that people were concerned about working in areas where smoke was present:^{xxiv}

"It was a real challenge for me as a teacher going into work when the smoke was particularly bad. I had to make sure I changed all my classrooms and airconditioned rooms just to get that airflow through. I know a lot of parents are feeling that anxiety about sending their kids back as well."

"Workplace (government building) could not keep smoke out & still had to attend."

"[The hospital] where I work smoke collects in corridors & outside surgical theatres."

Institutions including workplaces, universities, schools, early learning centres, sporting associations and venues and cultural institutions and events did not have policies in place prior to the 2019-20 Spring and Summer period, as sustained periods of poor air quality were not common in Australia. In contrast, Singapore experiences regular 'haze' events as a result of forest burning conducted in neighbouring countries to clear land for agricultural use.^{xxv} Singapore's Ministry of Education has developed 'haze management plans' that can be implemented by schools when required.^{xxvi} These plans include a measure that when air quality is considered 'unhealthy': "Students, including those with pre-existing lung or heart conditions, will be in an enclosed indoor space with air purifiers deployed."^{xxvii}

Policy response

The provision of health information about poor or hazardous air quality should not be left to times of crisis. Instead, information on air quality should be provided year-round, with a focus on improving environmental health literacy so that the community is able to interpret health advice when it is provided in times of crisis.

Health advice provision at times leading up to bushfire season can assist people to know what to do when a crisis event occurs and to understand how to best manage their health and reduce their risk of adverse health impacts due to exposure. This information provision is particularly important for people who are vulnerable to the health harms that result from poor and hazardous air quality, including people with respiratory conditions including asthma, older people, pregnant women and children. This information should also include general health advice that is likely to reduce the adverse health impacts including maintaining a healthy diet and keeping well hydrated.^{xxviii}

People with asthma should be encouraged through ongoing education campaigns to ensure that their Asthma Management Plans are up to date ahead of the bushfire season so that they have plans in place to prevent and manage their health during periods of poor and hazardous air quality. People with asthma can also be advised more frequently to take their preventer medication the two to three weeks leading up to an event. Asthma Australia is well placed to deliver an ongoing education campaign, given the links to the community and those that are living with asthma.

During times of crisis, such as sustained periods of poor and hazardous air quality due to bushfires, there is a need to increase health information and advice messaging and ensure that the messaging is targeted based on the conditions.

Over December 2019 and January 2020, calls and referrals to Asthma Australia's helpline increased by 58% per cent from the December-January period in the previous year. During this period there was also a significant increase in engagement on Asthma Australia's online and social media platforms with people seeking information and advice on what to do in events of poor and hazardous air quality as a result of bushfires. Analysis of Asthma Australia's digital platforms shows a 300% increase in traffic across website and social media pages.

Asthma Australia is well placed to provide information to people on the risks associated with poor air quality due to their large networks of health professionals, health agencies and people with asthma. To ensure that this support is maintained, funding is required for ongoing information provision and preparation for a crisis event and for increasing support at high risk times, such as during the bushfire season and other foreseeable crises.

It is also important that any health information or advice is provided in culturally appropriate ways to people from Culturally and Linguistically Diverse (CALD) backgrounds and people with lower environmental health literacy. This is vital to ensure that all people receive the information they need to keep healthy and well.

Recommendation 5

Provide funding to government and non-government health agencies for health education measures to reduce the risk of adverse health impacts of poor air quality, including:

- year-round information to improve environmental health literacy for people*
- targeted information for people with asthma on actions to take to prepare for such events*
- increased crisis response for periods of sustained poor air quality, such as during bushfires*

(b) the provision of various protective materials including face masks and air purifiers;

(Policy priority: Manage the adverse health impacts of poor air quality through targeted support, particularly for people who are at greater risk, including people with asthma – continued)

Air purifiers

People with asthma may need to operate air purifiers with HEPA filters or run air conditioning during periods of poor air quality to assist them in breathing clean air and reduce their risks of an asthma flare up. Air purifiers can be highly effective in minimising exposure to bushfire smoke when used as recommended by the manufacturer in a well-sealed room.^{xxix} However, the cost of energy needed to power air purifiers or air conditioners during periods of sustained poor air quality can be prohibitive for many people with asthma.

The Australian Department of Health provides people with an eligible medical condition an annual payment of \$160 towards the energy costs for ‘medically required heating or cooling, and each piece of qualifying essential medical equipment’.^{xxx} However, the current scheme does not include asthma as an eligible medical condition to receive the payment for medically required heating or cooling. Further, the current scheme does not include air purifiers in the list of eligible medical equipment.

Extending the ‘Essential Medical Equipment Payment’ to people with asthma and air purifiers with HEPA filters would be particularly beneficial to people who have lower socio-economic status.

Recommendation 6

The NSW government provide support to people with asthma towards the costs associated with using air purifiers with a HEPA filter to avoid asthma flare ups.

Face masks

One recommendation to reduce the risk of harm from poor and hazardous air quality was to use P2/N95 facemasks, however people in some areas heavily affected by bushfire smoke were unable to access facemasks due to high demand.

During the Spring/Summer 2019-20 period, the Australian Government distributed more than 3.5 million P2 masks to states and territories for use by people in bushfire affected communities, the Australian Defence Force, Australia Post and Australian Federal Police personnel.^{xxxii} NSW Health distributed over one million of these facemasks to people in the most heavily impacted regions of the state. However, there were still shortages of masks at times when poor and hazardous air quality peaked. Many of these masks are disposable and are not designed to be re-used.

Furthermore, for masks to work well, they need to fit the face of the person and be well sealed around the mouth and nose. Wearing these masks can make it difficult for some people to breathe, make it hot and uncomfortable and lead to a false sense of security which results in a person staying outdoors for longer.^{xxxiii} Research is needed of into the availability of different mask types for different face types and the advice provided to the community about the use of masks to ensure that they are providing the protection needed to avoid the adverse health impacts against bushfire smoke.

The advice from Asthma Australia's Professional Advisory Council, is that P2 masks are not designed and suitable for children under the age of 14 years. Although some masks may be available in small sizes, it is unlikely that they will have a perfect fit and are therefore unlikely to be beneficial. A poorly fitted mask makes it harder to breathe which leads to rebreathing of expired air (with high carbon dioxide levels) which can make you feel unwell and cause anxiety in children.

The stockpiling and provision of the most appropriate masks as part of a broader response to reducing the risks of poor and hazardous air quality is recommended to ensure they are available to consumers during periods of sustained poor and hazardous air quality. We also need a strategy for how these masks will be distributed in a timely manner to people in the community who are experiencing the greatest disadvantage and are most at risk, and to organisations in contact with at-risk communities. Asthma Australia needs to be part of the communication about access and use of this of this equipment.

Recommendation 7

NSW Health ensure that appropriate protective equipment (such as P2 masks) is stockpiled and a strategy for distribution is developed to ensure people in areas affected by poor and hazardous air quality in a timely manner, particularly to people who are in high risk groups.

Recommendation 8

NSW Health develop clear guidelines on how to protect children from exposure to poor and hazardous air, in the absence of P2 masks being effective for them.

(c) the ability to ensure the health of at-risk groups;

Policy priority: Improve hazard reduction burning practices to minimise health impacts

Longer fire seasons present challenges for communities including a reduced number of days when hazard reduction burning can take place. The number of days is further reduced by the increasing frequency of adverse weather events as a result of climate change. As a result, when there are opportunities for hazard reduction burning, these activities can occur over several consecutive days. For example, in May 2019 there were five consecutive days of hazardous air quality in Sydney due to hazard reduction burning in the greater Sydney region. For people with asthma, these activities can be extremely hazardous and can head to life-threatening symptoms.

Research into the impact of poor air quality days in Sydney caused by hazard reduction burns in May 2016 indicated that these actions resulted in 14 premature deaths of people with respiratory and cardiovascular diseases.^{xxxiii} An Asthma Australia survey of 500 people from areas affected by sustained hazardous air quality in Sydney in May 2019 reported that 81% of respondents reported experiencing difficulty breathing because of poor and hazardous air quality. Almost one in five people (19%) experienced an asthma emergency, including 17% being prescribed oral corticosteroid medication, 3% reporting attending a hospital emergency department and 2% being admitted to hospitals. There were also financial and productivity impacts, with 21% reporting being sick for longer than a week, 28% having to take sick leave or work from home and 22% experiencing unexpected financial costs due to extra medication or equipment needs.^{xxxiv}

Policy response

Australia is one of the world's most bushfire prone countries and many of the areas most heavily hit by the unprecedented 2019/2020 Australian bushfires were in NSW. Both bushfires and burns implemented to reduce the risk or size of bushfires or for other reasons, known as 'hazard reduction' or 'planned' burns, create poor air quality that is hazardous for people with asthma and other respiratory conditions.

Hazard reduction burns planning needs to balance health consequences against the need to conduct hazard reduction burning. Agencies responsible for hazard reduction burns across the country need to appropriately consider the health impacts on the community and particularly people experiencing respiratory conditions such as asthma. Strategies include burning at the right time of day and staggering hazard reduction activities so prolonged periods of poor or hazardous air quality are avoided.

Communication relating to hazard reduction burning needs to occur between environmental or emergency agencies responsible for the activity and health agencies who are responsible for communicating advice to people about reducing their risk of exposure. Communities potentially affected by hazard reduction practices should have appropriate warning and capacity to reduce their risk exposure. With adequate warning, people with asthma can start planning for the event, including effectively using prescribed preventer medication two to three weeks before hazard reduction burn season. This is another important measure to build community and personal resilience to airborne triggers.

Recommendation 9

The NSW Rural Fire Service and State Emergency Services should:

- *Include health authorities and a consumer representative in planning for burning so that health impacts are considered;*
- *Coordinate activities with health authorities so that health messages can be provided to the community ahead of the planned burn to ensure that the potential for adverse health impacts is minimised; and*
- *Where possible, stagger burns and ensure they do not result in prolonged periods of poor and hazardous air quality.*

Terms of Reference 3. Any related matters.

Policy priority: Take action to address climate change to reduce the frequency and severity of catastrophic bushfires and associated hazardous air quality

Climate change is an existential threat that creates ill health through impacts on air quality, drinking water, food supply and safe shelter.^{xxxv} The 2020 WHO-UNICEF-Lancet analysis; ‘A future for the world’s children?’ raised climate change and ecological degradation among the greatest issues ‘threaten[ing] the health and future of children in every country’. The paper went on to say that “Governments must harness coalitions across sectors to overcome ecological and commercial pressures to ensure children receive their rights and entitlements now and a livable planet in the years to come.”^{xxxvi}

Climate change is resulting in hotter days and more frequent heatwaves. In 2008, Professor Ross Garnaut was commissioned by the Federal, state and territory governments to examine the impacts of climate change on Australia and to recommend policy frameworks. His final report concluded that “...fire seasons will start earlier, end slightly later, and generally be more intense. This effect increases over time, but should be directly observable by 2020”.^{xxxvii}

There has also been a rising trend in bushfire danger, with the annual accumulated McArthur Forest Fire Danger Index (FFDI) increasing across most of Eastern Australia, indicating an increase in the frequency and severity of dangerous fire conditions.^{xxxviii}

In some areas of southern New South Wales (as well as southern Queensland and Victoria), the trend towards a lengthened fire season has already been detected.^{xxxix} Future projections also show an increase in FFDI due to increased greenhouse emissions over the course of the century.^{xl} This data suggests that sustained periods of poor and hazardous air quality as a result of bushfires are likely to be seen more frequently in the future.

Policy response

Any action to minimise the adverse health impacts of bushfire smoke on the health of the community and people with asthma needs to include a robust response to mitigating climate change. As Vardoulakis et al. stated in a recent rapid review of the health advice needed to protect communities from bushfire smoke, “Working towards ambitious climate change mitigation targets is an essential long-term strategy for managing the underlying causes of the increasing bushfire risk in Australia and overseas.”^{xli}

The 2015 Paris Agreement’s long-term temperature goal is to limit the global average temperature increase to well below 2°C above preindustrial levels and to pursue efforts to limit the temperature increase to 1.5°.^{xlii} The NSW government needs to show leadership in this area and take decisive and evidence-based action to reduce emissions and contribute towards this goal.

Recommendation 10

The NSW Government take action to mitigate climate change and the associated weather conditions causing longer bushfire seasons and sustained periods of poor and hazardous air quality.

-
- ⁱ Pallavi Singhal, 'New Situation' Record 81 days of bad air quality in Sydney (Sydney Morning Herald, Sydney) 24 January 2020; NSW Department of Planning, Industry and Environment (2020).
- ⁱⁱ Centre for Air pollution, energy and health Research-CAR (2019). Bushfire smoke: what are the health impacts and what can we do to minimise exposure? Located online: <https://www.car-cre.org.au/position-papers>
- ⁱⁱⁱ Vardoulakis. S, Jalaludin. B, Morgan. Hanigan. I & Johnston. F (2020) Bushfire smoke: urgent need for a national health protection strategy, *Medical Journal of Australia*, doi: 10.5694/mja2.50511
- ^{iv} Healthstats NSW, NSW Ministry of Health April 2019.
- ^v Australian Bureau of Statistics 2018; National Health Survey: First Results 2017-18. ABS Cat no. 4364.0.55.001. Canberra: ABS.
- ^{vi} Centre for Air pollution, energy and health Research-CAR (2019). Bushfire smoke: what are the health impacts and what can we do to minimise exposure? Located online: <https://www.car-cre.org.au/position-papers>
- ^{vii} Hazelwood Health Study (hazelwoodhealthstudy.org.au), as cited in Centre for Air pollution, energy and health Research-CAR (2019). Bushfire smoke: what are the health impacts and what can we do to minimise exposure? Located online: <https://www.car-cre.org.au/position-papers>
- ^{viii} Long term exposure to ambient fine particulate matter and incidence of stroke: prospective cohort study from the China-PAR project, *BMJ* 2019; 367 doi: <https://doi.org/10.1136/bmj.l6720>
- ^{ix} Centre for Air pollution, energy and health Research-CAR (2019). Bushfire smoke: what are the health impacts and what can we do to minimise exposure? Located online: <https://www.car-cre.org.au/factsheets>
- ^x Borchers-Arriagada N, Horsley JA, Palmer AJ, Morgan GG, Tham R, Johnston FH. Association between fire smoke fine particulate matter and asthma-related outcomes: Systematic review and meta-analysis. *Environmental research*. 2019 Sep 26:108777, As cited in Centre for Air pollution, energy and health Research-CAR (2019). Bushfire smoke: what are the health impacts and what can we do to minimise exposure? Located online: <https://www.car-cre.org.au/position-papers>
- ^{xi} Asthma Australia Survey: Impacts of bushfire smoke on asthmatics, January 2020
- ^{xii} Asthma Australia Survey: Impacts of bushfire smoke on asthmatics, January 2020
- ^{xiii} ACT Government Education Directorate, Information on managing air quality in ACT public schools, 3 February 2020, <https://www.education.act.gov.au/about-us/all-news-and-news-alerts/news-items/january-2020/air-quality-in-schools>
- ^{xiv} Australian Government Department of Health, Chief Medical Officer's and State and Territory Chief Health Officers' guidance on health effects of exposure to bushfire smoke, 27 January 2020, <https://www.health.gov.au/news/chief-medical-officers-and-state-and-territory-chief-health-officers-guidance-on-health-effects-of-exposure-to-bushfire-smoke>
- ^{xv} Safework Australia, Bushfires and air pollution, 8 January 2020, <https://www.safeworkaustralia.gov.au/media-centre/news/bushfires-and-air-pollution>
- ^{xvi} Safework Australia, Bushfires and air pollution, 8 January 2020, <https://www.safeworkaustralia.gov.au/media-centre/news/bushfires-and-air-pollution>
- ^{xvii} National Environment Protection Council (NEPC), <http://www.nepc.gov.au/>
- ^{xviii} National air quality standards Ambient air quality (2016), <https://soe.environment.gov.au/theme/ambient-air-quality/topic/2016/national-air-quality-standards>
- ^{xix} Department of Agriculture, Water and Environment, Particulate matter (PM10 and PM2.5), <http://www.npi.gov.au/resource/particulate-matter-pm10-and-pm25>
- ^{xx} Australia State of the Environment (2016) National Air Quality Standards. <https://soe.environment.gov.au/theme/ambient-air-quality/topic/2016/national-air-quality-standards>
- ^{xxi} National Environment Protection Council, Webpage: National Environment Protection Measures (NEPM's). <http://www.nepc.gov.au/nepms>
- ^{xxii} Cherrie JW, Apsley A, Cowie H, et al. Effectiveness of face masks used to protect Beijing residents against particulate air pollution. *Occup Environ Med* 2018; 75: 446–452, As cited in Vardoulakis. S, Jalaludin. B, Morgan. Hanigan. I & Johnston. F (2020) Bushfire smoke: urgent need for a national health protection strategy, *Medical Journal of Australia*, doi: 10.5694/mja2.50511
- ^{xxiii} Vardoulakis. S, Jalaludin. B, Morgan. Hanigan. I & Johnston. F (2020) Bushfire smoke: urgent need for a national health protection strategy, *Medical Journal of Australia*, doi: 10.5694/mja2.50511
- ^{xxiv} Asthma Australia Survey: Impacts of bushfire smoke on asthmatics, January 2020

-
- ^{xxv} National Environment Agency (2020). Air pollution. <https://www.nea.gov.sg/our-services/pollution-control/air-pollution/managing-haze>
- ^{xxvi} Ministry of Education (2019). Haze management measures. <https://www.moe.gov.sg/haze-management-measures>
- ^{xxvii} Ministry of Education (2019). Haze management measures. <https://www.moe.gov.sg/haze-management-measures>
- ^{xxviii} Vardoulakis, S, Jalaludin, B, Morgan, Hanigan, I & Johnston, F (2020) Bushfire smoke: urgent need for a national health protection strategy, *Medical Journal of Australia*, doi: 10.5694/mja2.50511
- ^{xxix} Vardoulakis, S, Jalaludin, B, Morgan, Hanigan, I & Johnston, F (2020) Bushfire smoke: urgent need for a national health protection strategy, *Medical Journal of Australia*, doi: 10.5694/mja2.50511
- ^{xxx} Australian Government Services Australia, Essential Medical Equipment Payment, Who can get it and how much you can get, 28 October 2019, <https://www.servicesaustralia.gov.au/individuals/services/centrelink/essential-medical-equipment-payment/who-can-get-it-and-how-much-you-can-get>
- ^{xxxi} The Hon Greg Hunt MP, Minister for Health, Number of P2 masks provided for bushfires almost 3.5 million, 10 January 2020, <https://www.greghunt.com.au/number-of-p2-masks-provided-for-bushfires-almost-3-5-million/>
- ^{xxxii} Centre for Air pollution, energy and health Research-CAR (2019). Bushfire smoke: what are the health impacts and what can we do to minimise exposure? Located online: <https://www.car-cre.org.au/position-papers>
- ^{xxxiii} Broome, R. A, Johnston, F. H, Horsley, J and Morgan, G. G (2016) A rapid assessment of the impact of hazard reduction burning around Sydney, May 2016, *Med J Aust* 2016; 205 (9): 407-408. || doi: 10.5694/mja16.00895 <https://www.mja.com.au/journal/2016/205/9/rapid-assessment-impact-hazard-reduction-burning-around-sydney-may-2016>
- ^{xxxiv} Asthma Australia, Sydney Smoke Impact Survey Results, June 2019, https://asthma.org.au/wp-content/uploads/About_Us/Media_Releases/Asthma-Australia-Sydney-Smoke-Survey-Results_WEB.pdf
- ^{xxxv} World Health Organization, Climate Change and Health, 1 February 2018, <https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health>
- ^{xxxvi} Climate Council, 'This is Not Normal': Climate change and escalating bushfire risk, 12 November 2019 https://www.climatecouncil.org.au/wp-content/uploads/2019/11/bushfire-briefing-paper_18-november.pdf
- ^{xxxvii} Garnaut, Ross. (2008). The Garnaut Climate Change Review.
- ^{xxxviii} Australian Government Bureau of Meteorology, Special Climate Statement 71—severe fire weather conditions in southeast Queensland and northeast New South Wales in September 2019, 24 September 2019, <http://www.bom.gov.au/climate/current/statements/scs71.pdf>
- ^{xxxix} Australian Government Bureau of Meteorology, Special Climate Statement 71—severe fire weather conditions in southeast Queensland and northeast New South Wales in September 2019, 24 September 2019, <http://www.bom.gov.au/climate/current/statements/scs71.pdf>
- ^{xl} Australian Government Bureau of Meteorology, Special Climate Statement 71—severe fire weather conditions in southeast Queensland and northeast New South Wales in September 2019, 24 September 2019, <http://www.bom.gov.au/climate/current/statements/scs71.pdf>
- ^{xli} Vardoulakis, S, Jalaludin, B, Morgan, Hanigan, I & Johnston, F (2020) Bushfire smoke: urgent need for a national health protection strategy, *Medical Journal of Australia*, doi: 10.5694/mja2.50511
- ^{xlii} United Nations (2015). Paris Agreement. <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>