

## Climate Health WA Inquiry

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Are you responding on behalf of an organisation or group?

No

Yes

If yes, please identify the organisation:

### Your contact details

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### Publication of submissions

Submissions will be published with the name of the submitter unless otherwise indicated below. Do you consent to be identified in the published submission?

Yes, I / my organisation agree to be identified

No, I / my organisation request to remain anonymous

### Terms of Reference

You are encouraged to address at least ONE of the Terms of Reference as listed below. Please select which item/s you will address:

1. Establish current knowledge on the implications of climate change for health in Western Australia (WA) and recommend a framework for evaluating future implications.

2. Identify and recommend a program of work to manage the implications of climate change for health in WA, which will protect the public from the harmful health impacts of climate change.

3. Identify and recommend a program of work to manage the implications of climate change for health in WA, which will strengthen the preparedness and

resilience of communities and health services against extreme weather events, with a focus on the most vulnerable in the community.

- 4. Identify and recommend a program of work to manage the implications of climate change for health in WA, which will reduce the contribution of WA health services to climate change and other detrimental impacts.
- 5. Identify and recommend a program of work to manage the implications of climate change for health in WA, which will enable WA Health services to implement change, including energy efficiency, to a more sustainable model.
- 6. Evaluate the likely benefits (health and wellbeing, social and economic) arising from climate change mitigation strategies, with a focus on WA health services.
- 7. Define the role of the Department of Health in leading public policy on climate change and health.
- 8. Recommend the Terms of Reference, scope and preferred methods for undertaking a climate change vulnerability assessment for the health sector.
- 9. Recommend the Terms of Reference, scope and preferred methods for developing a Climate Change Adaptation Plan for the health sector.

### Submissions response field

**Please type your response to the item(s) selected above into the field below. Alternatively you may provide your submission as a separate attachment (suggested maximum 5 pages).**

#### About this submission

This submission focusses on the impacts of climate change on air pollution and health in Western Australia (WA). I make this submission in my capacity as a medical specialist and researcher in public health. I lead the Environmental Health research group at the Menzies Institute for Medical Research, University of Tasmania and for the last 20 years have been investigating the public health impacts of bushfires, outdoor smoke and other environmental hazards, and interventions to reduce these impacts.

#### Summary

The available evidence strongly suggests that climate change will cause bushfires and the associated air pollution to increase in frequency and severity in fire prone landscapes such as WA. Landscape scale fuels management programs and maintaining excellent systems for emergency responses to bushfires therefore remain essential. However, more active management of the health impacts of smoke from both prescribed burns and bushfires will be crucial in WA as part of adaptation to climate change. Health management adaptation responses to this should include:

**(1) developing and implementing better ways of supporting and protecting the health of people at higher risk during episodic fire smoke events.** These could include user-friendly real-time communication systems that provide advanced warnings of possible prescribed burn smoke impacts and information

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about current, rather than the previous 24-hours air pollution levels. Such advice needs to be easily accessible to all people regardless of their education or social advantage or disadvantage. Priority should also be given to ongoing education of the public and health care providers about the health impacts of severe smoke events including who are more vulnerable to air pollution and how they can reduce their health risks. Further, public health and other relevant agencies need to be prepared for managing coincidental bushfire, smoke and heat health emergencies.

**(2) reviewing bushfire risk reduction strategies to ensure that the overall public benefit is maintained when considering public health harms from interventions such as prescribed burning.** Maximising public health and safety could involve the increased use of strategies that do not cause serious population exposure to air pollution. Examples include strategic modification of the vegetation in landscapes to reduce fuels and create green fire breaks near populated areas, and modifying and upgrading buildings for improved fire resilience. It should also include modifying the way that wide-scale prescribed burning is implemented to reduce the harms of the associated air pollution. There should be consideration of increased support for Aboriginal cultural burning which has been shown in other settings to be associated with multiple health benefits, including less overall air pollution.

**(3) implementing policies that address the underlying causes of chronic diseases and health inequalities.** Excess illness and deaths from air pollution, heatwaves and other impacts of climate change disproportionately affect older people, those with chronic diseases, and those with greater social disadvantage. Addressing these factors will promote community resilience and reduce the health, social and economic impacts of climate change.

#### Current knowledge

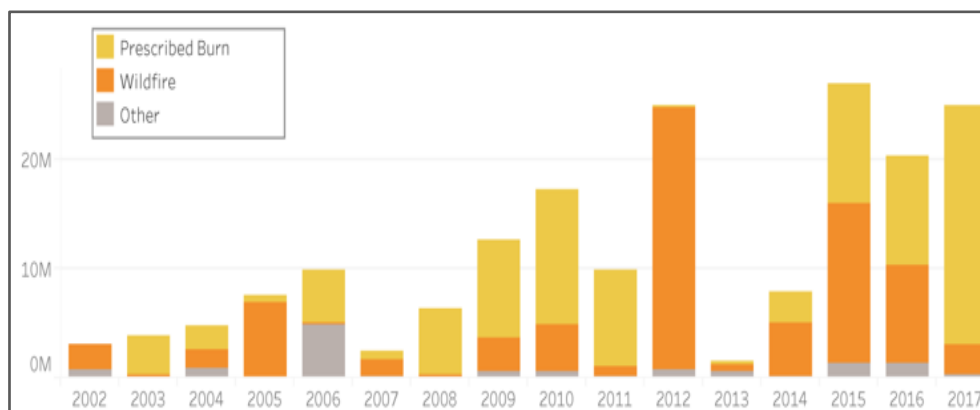
Climate change is causing fire seasons to start earlier and finish later,<sup>1 2</sup> and causing more extreme fire events associated with anomalous meteorological conditions.<sup>3</sup> While fires are integral to Australian landscapes due to the highly fire adapted vegetation, it is the extreme events that are more likely to cause disasters with substantial social and economic harms from the loss of life, livelihoods, property and infrastructure.<sup>3-5</sup> This is why landscape-scale fuels management and maintaining excellent systems for emergency responses to bushfire disasters remain essential.

Further, increases in landscape fire activity overall, will increase the harms from air pollution.<sup>6</sup> Smoke emissions from all types of fire, extreme or not, cause a substantial and increasing burden of burden of fire-related illness and deaths in Australia. For example, in Sydney, 197 deaths were estimated as being attributable to smoke from landscape fires, including both bushfires and prescribed burns, from 2001-2013,<sup>7</sup> while five direct fire-related deaths were reported during the same period.<sup>8</sup>

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Analysis of government reports of the causes of air quality exceedances in populated regions of southwest WA by my research team was presented at the UWA Prescribed Burning Conference in Perth, 2019. It showed that air pollution related health costs (from deaths and hospital admissions) on days when air quality standards were exceeded averaged \$11.6 million per year from 2002 to 2017.<sup>9</sup> Around half (51%) of the burden was attributable to smoke from prescribed fires, 42% to bushfire smoke, and the remaining 7% to other causes of air pollution.<sup>9</sup> Further, while there was considerable fluctuation from year to year, landscape fire smoke impacts appear to have been increasing through time, especially since 2010 (Figure). This is consistent with research in the US which has demonstrated that climate change related increases in landscape fire smoke emissions have the potential to offset health gains from reducing pollution emissions from other sources.<sup>10 11</sup> For example it has been estimated that premature mortality associated with wildfire smoke will double in the US by 2100.<sup>10</sup> Similar projections have not been done for Australia.



**Figure. Estimated annual health costs from deaths and hospital admissions attributable to air pollution on days when air quality standards were exceeded, 2002-2017.** This demonstrates that landscape fire smoke is the most important source of poor air quality in Perth and Southeastern WA, and that impacts could be worsening through time, although there is a lot of year to year fluctuation. (N Borchers, preliminary analyses 2019).

### Recommended responses

**(1) Develop and implement better ways of supporting and protecting the health of people at higher risk of health harms during episodic fire smoke or other pollution events.**

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Adaptation requires new ways of understanding and managing air quality, with a move towards better provision of timely community level information to support individual action and self-management.<sup>12-14</sup> Historically, air quality standards were introduced for regulatory purposes in response to chronic background air pollution. The standards for particulate matter, the most important pollutant in fire smoke, are based on 24-hour average measurements. However timely action, such as closing doors and windows or taking preventive medication for asthma, is not possible if public health warnings are only provided after an exceedance of the 24-hour air quality standard has been recorded.<sup>15 16</sup> Technological solutions that incorporate information from traditional monitoring, remote sensing, and low-cost sensors can be shared in near real-time through internet-based technologies and mobile phone applications.<sup>12</sup> These services can then provide advanced warnings of possible prescribed burn smoke impacts and information about current, rather than the previous 24-hour air pollution levels. Examples of this approach include the *SmokeSense* app developed by the United States Environmental Protection Authority,<sup>17</sup> and the Australian *AirRater* service developed by our team at the University of Tasmania.<sup>14</sup> *AirRater* is currently in use in Tasmania, the ACT and Darwin supported by the Health Departments or Environmental Protection Authorities in those locations. It has also been made available to assist the current public health response to persistent smoke from a burning peat swamp that has been affecting Port Macquarie in NSW (<https://airrater.org/news/>). Specialised smoke tracking versions are being evaluated in WA and Victoria.

A further priority is ongoing public education about the health risks associated with severe smoke events (and heatwaves), including who are at greater risk from smoke impacts and what they can do to protect their health. Western Australians will increasingly be living through hot and smoky periods and the knowledge and resources for manage their health will become an increasingly important life skill.

Similarly, education of health service providers should be a high priority as education about the health impacts of air pollution and other environmental hazards has not been a traditional part of education for doctors or other health professionals and the evidence has rapidly expanded in recent years. For example, evidence about potential harms of exposure to air pollution during pregnancy has been building for both chronic background pollution,<sup>18 19</sup> and in relation to outdoor smoke episodes.<sup>20-24</sup>

Finally, as periods of hot weather often coincide with severe fire episodes, public health emergency plans need to incorporate procedures for responding to concurrent severe fires, air pollution and extreme heat events. This could include identification of possible locations that could be used for cleaner and cooler air shelters and the development of policies about the use of portable air cleaners, which have been shown to be protective of health in international studies.<sup>25</sup>

**(2) Review existing bushfire risk reduction strategies to ensure that the overall public benefit is maintained.** This should include assessment of health

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harms potentially caused by management activities, in addition to the harms potentially avoided.

Maximising public health and safety will require the increased use of strategies that do not cause serious population exposure to air pollution. While these can be more costly per hectare to implement than prescribed burning, the considerable cost savings achieved by reducing smoke-related harms could make them highly cost effective. The cost effectiveness and health trade-offs of different management interventions should therefore be quantified. Examples of alternative strategies include the modification of vegetation in landscapes using mechanical treatments, mowing, or grazing to reduce understorey fuels to create corridors, or green fire breaks, that provide defensible barriers between highly flammable landscapes and places (eg populated areas) needing protection from bushfires.<sup>26</sup> Other risk reduction strategies include designing or modifying existing buildings for improved fire resilience,<sup>27</sup> and incorporating 'fire-smart' urban design principles.<sup>28</sup>

Prescribed burning will remain central to bushfire risk mitigation and land management. Consideration should therefore be given to ways of implementing this in ways that reduce the harms of the associated air pollution. This should include greater support for Aboriginal cultural burning and land management which has been shown in other Australian settings to be associated with better health of those managing the land, and less overall air pollution.<sup>29 30</sup>

Agencies conducting prescribed burning should use forecasting tools to predict the expected smoke and public health impacts and develop evidence-informed criteria for proceeding with, modifying or deferring the planned burns based on these outputs. Burns conducted by many different agencies should be coordinated with respect to smoke impacts. All populations in the likely footprint of smoke should have advance notification that air quality might be affected to enable them to take preventive and protective action for their health.

**(3) Implement policies that address the underlying causes of chronic diseases and health inequalities.** Excess illness and deaths from air pollution, heatwaves and other impacts of climate change disproportionately affect older people, those with chronic diseases, and those with greater social disadvantage.<sup>31</sup> Local research in Perth has also demonstrated this.<sup>32</sup> Addressing these factors will promote community resilience and reduce the health, social and economic impacts of climate change. One example of this approach could be the support of local community gardens. These could be located in areas where they contribute to green fire breaks to enhance protection from bushfire, promote social connection, physical activity and nutrition – all protective factors against chronic diseases. Support for Aboriginal cultural burning programs would likely also have health and social benefits beyond fire protection.<sup>33</sup>



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