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Findings of the 2020 Lancet Countdown on Health and Climate Change

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Introduction

The Lancet Countdown is an international collaboration established to provide an independent, global monitoring system dedicated to tracking the emerging health profile of the changing climate, with its 2020 report prepared by Watts et al. (2020). The MJA–Lancet Countdown on health and climate change, the Australian component of this global collaboration, was established in 2017. It produced its first Australian national assessment in 2018, its first annual update in 2019, and has published a special report for 2020 (Beggs and Zhang, 2020; Zhang et al., 2020). These surveys examine indicators across five broad domains: climate change impacts, exposures and vulnerability; adaptation, planning and resilience for health; mitigation actions and health co-benefits; economics and finance; and public and political engagement.

Impacts in Australia

The 2020 MJA-Lancet special report (Beggs and Zhang, 2020; Zhang et al., 2020) presents an update that describes the catastrophic 2019-20 Australian 'Black Summer' bushfire season, with a focus on the relationship between health, climate change and bushfires. The Black Summer bushfires lasted 3 months in total, spanned 18 million hectares, destroyed more than 3000 houses, and resulted in 35 deaths (Risk Frontiers' submission to the Royal Commission into National Natural Disaster Arrangements).

The MJA-Lancet report showed that Australia experienced one of the greatest increases in fire risk globally over the last two decades, with an annual average increase of 30.6 days of high to extreme Fire Danger Index in 2016-2019 compared with 2001-2004. Nationally, there was a 22% increase in the annual average days of population exposure to bushfires in 2016-2019 compared with the 2001-2004 baseline period but it is unclear how the report dealt with the influence of population change over this period. Due to the Black Summer bushfires, the 102,799 person-days of exposure to bushfires in 2019 (Figure 1) in NSW was by far the highest of any year over the period 2001-2019, with the second highest being 71,452 in 2002 (the Black Christmas, NSW South Coast and Sydney bushfires). This finding is consistent with the relativity of the Black Summer burnt area and building damage in NSW over this period as reported in our Royal Commission submission.

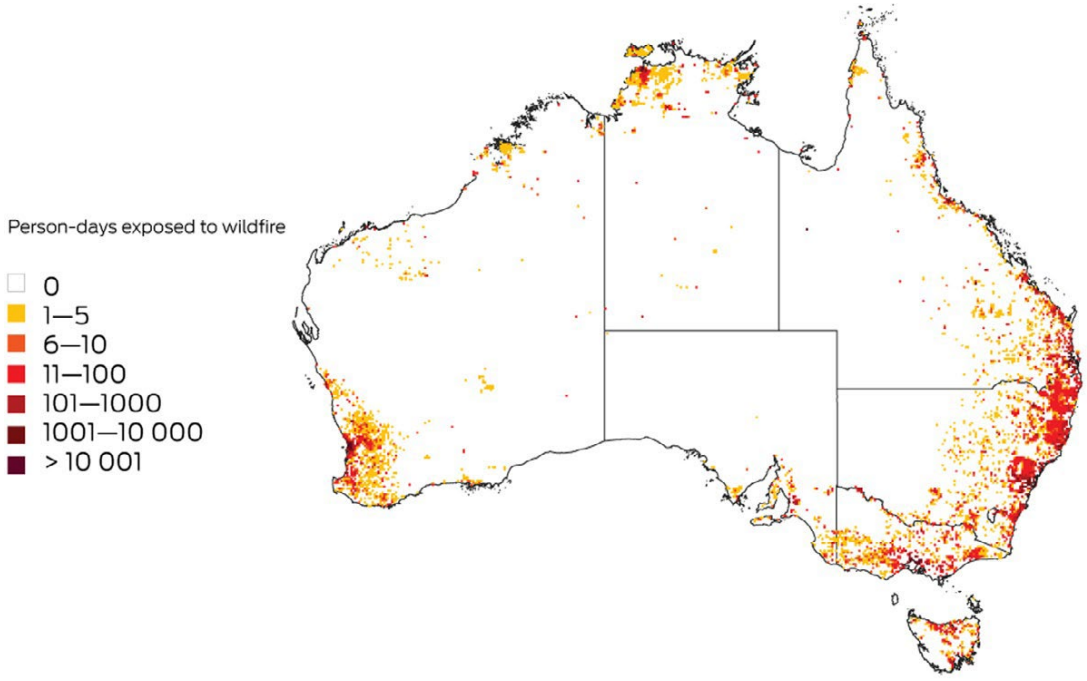

Figure 1. Map of person-days of bushfire exposure in Australia in 2019. Data source: NASA.

As stated in the MJA-Lancet report, the continuing increases in summer maximum temperatures and heatwave intensity are causing substantial increases in both fire risk and population exposure to bushfires and are having a significant impact on Australia's health and economy. As a result of the Black Summer bushfires, the monthly airborne particulate matter less than 2.5 µm in diameter (PM2.5) concentrations in NSW and the ACT in December 2019 were the highest of any month in any state or territory over the period 2000-2019 at 26.0 µg/m3 and 71.6 µg/m3 respectively. The intensity and expansiveness of the Black Summer bushfires resulted in about 450 deaths due to direct injury and air pollution exposure.

The MJA-Lancet report also presented an annual time series of the McAneney et al. (2019) normalised insured losses from the Insurance Council of Australia from 2000-2019. Their figure shows an increasing trend over this period, consistent with McAneney et al. (2019), but such a trend is not apparent in the full time series since 1967 published in McAneney et al. (2019). A point of departure between the respective time series is that McAneney et al. (2019) aggregated losses within 12-month periods commencing July 1 to take into account the seasonality of the weather-related hazards whereas the MJA-Lancet report seems to aggregate losses by calendar years.

Global impacts

Global impacts of climate change on human health have been summarised by Watts et al. (2020). Vulnerable populations were subjected to 475 million heatwave exposures globally in 2019, which was, in turn, reflected in excess morbidity and mortality. During the past 20 years, there has been a 53.7% increase in heat-related mortality in people older than 65 years, reaching a total of 296,000 deaths in 2018. In Europe in 2018, the monetised cost of heat-related mortality was equivalent to 1.2% of regional gross national income, or the average income of 11 million European citizens. Heatwave impacts feature prominently in Australia too. Research by Risk Frontiers has shown that they are responsible for almost half the total number of recorded natural hazard fatalities since 1900.

The high cost in human lives and suffering is associated with effects on economic output, with an excess of 100 billion potential work-hours hours lost globally in 2019 compared to 2000 due to rising temperatures (Watts et al. 2020). India and Indonesia were among the worst affected countries and agricultural workers most often hit. In high income countries it is construction workers that are frequently impacted.

Watts et al. (2020) also consider the potential downstream effects of climate change including impacts on broader environmental systems, which in turn harm human health. They state that global food security is threatened and the climate suitability for infectious disease transmission has been growing rapidly since the 1950s, with a 15% increase for dengue caused by *Aedes albopictus* in 2018, and regional increases for malaria and *Vibrio* bacteria.

The way forward

Australia's federal system makes healthcare a state responsibility, as has been demonstrated during the ongoing coronavirus pandemic. Because of this state-based approach, not all states and territories are coordinated on strategies linking health and climate. A national approach is essential for the emergency management of climate impacts on human health because it cannot be coordinated effectively with a state-by-state approach. We need to develop warning systems for extreme heat, map existing conditions and predicted and forecast conditions. We also need to develop new technology that aims to rapidly detect and suppress fires to prevent catastrophic fire events in the future.

In addition to mapping heatwave hazards and issuing warnings on a national scale, we also need to provide localised practical information about neighbourhood temperatures and where to find the coolest places to spend time during a heatwave. Urban planning can help cities avoid becoming heat traps and develop spaces aimed at improving physical and mental health. Green spaces on both large (parkland) and small (street planting) scales can increase shade or cooler zones throughout suburbs. Retrofitting homes with heat-reflective roofing and reducing concrete and paving in backyards by increasing grassed areas can lower air temperatures around homes.