Bushfire smoke – Public Health Communication during the Black Summer and beyond

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We acknowledge and celebrate the First Australians on whose traditional lands we meet, and pay our respects to the elders past, present and emerging.
Australia’s bush fires could last for months, with new rounds of dire conditions expected

By Andrew Freedman

November 13, 2019
Terrifying moment Qantas plane is forced to abort its landing because of thick smoke from bushfires
Bushfires on East Coast of Australia Out of Control

Sydney news: Sydney air quality reach 'hazardous' level due to smoke haze

Updated 30 Oct 2019, 10:28am

PHOTO: Helicopter footage of Sydney recorded this morning. (ABC News)

<table>
<thead>
<tr>
<th>Health advisory category</th>
<th>PM$_{2.5}$ (24 hour) concentration µg/m³</th>
<th>Potential health effects without following advice or actions</th>
<th>Cautionary health advice/actions**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>≤4.9</td>
<td>N/A – Exceeds the relevant air quality standard</td>
<td>None</td>
</tr>
<tr>
<td>Meets air quality standard</td>
<td>4.9 - 25.0</td>
<td>N/A – Meets the relevant air quality standard</td>
<td>No tailored advice necessary.</td>
</tr>
<tr>
<td>Unhealthy for sensitive groups</td>
<td>26 - 39.9</td>
<td>Symptoms may occur in sensitive groups</td>
<td>Sensitive groups should reduce prolonged or heavy physical activity. Where possible, these people in the community should also limit the time spent outdoors. Anyone with a heart or lung condition should take their medication as prescribed by their doctor. People with asthma should follow their asthma action plan. Anyone with concerns about their health should seek medical advice from their doctor. Anyone experiencing wheezing, chest tightness or difficulty breathing should seek urgent medical attention.</td>
</tr>
<tr>
<td>Unhealthy for all</td>
<td>40 - 105.9</td>
<td>Increased likelihood of effects for sensitive groups</td>
<td>Everyone should reduce prolonged or heavy physical activity. Sensitive groups should avoid prolonged or heavy physical activity altogether. Anyone with a heart or lung condition should take their medication as prescribed by their doctor. People with asthma should follow their asthma action plan. Anyone with concerns about their health should seek medical advice from their doctor. Anyone experiencing wheezing, chest tightness or difficulty breathing should seek urgent medical attention.</td>
</tr>
<tr>
<td>Very unhealthy for all</td>
<td>106 - 177.0</td>
<td>Significant likelihood of effects for sensitive groups</td>
<td>Everyone should avoid prolonged or heavy physical activity. Sensitive groups should avoid all physical activity outdoors. Anyone with a heart or lung condition should take their medication as prescribed by their doctor. People with asthma should follow their asthma action plan. Anyone with concerns about their health should seek medical advice from their doctor. Anyone experiencing wheezing, chest tightness or difficulty breathing should seek medical attention.</td>
</tr>
<tr>
<td>Hazardous high</td>
<td>&gt;177.0</td>
<td>Serious likelihood of effects for sensitive groups</td>
<td>Everyone should avoid all physical activity outdoors. Sensitive groups should temporarily relocate to a friend or relative. Being outside the affected area. If this is not possible, remain indoors and keep activity levels as low as possible. Anyone with a heart or lung condition should take their medication as prescribed by their doctor. People with asthma should follow their asthma action plan. Anyone with concerns about their health should seek medical advice from their doctor. Anyone experiencing wheezing, chest tightness or difficulty breathing should seek medical attention. Anyone experiencing symptoms which may be due to smoke exposure should consider taking a break away from the smoky conditions.</td>
</tr>
<tr>
<td>Hazardous extreme</td>
<td>&gt; 250</td>
<td>Serious likelihood of effects for sensitive groups</td>
<td>Cautionary health advice and actions are the same as for Hazardous high.</td>
</tr>
</tbody>
</table>
Vulnerable groups

- Young children
- The elderly
- Those with respiratory illness
- Those with cardiovascular illness
- Those with diabetes
- Pregnant women
- Outdoor workers
- Homeless people
- Lower socioeconomic groups
Smoke pollution advice impractical: expert

Jodie Stephens
Health Advice

ANUPopulationHealth @ANUPopHealth · 10 Dec 2019
Professor @SotirisVard spoke with @canberratimes about the smokey air that persists again today. Read the story here: bit.ly/2Y0IUvN

@scienceANU @ANU_Climate @LancetCountdown

Is breathing smoky air really the same as smoking several cigarettes a week?

By Isaac Newrozi and Alexandra Alvera
Posted Thu 9 Jan 2020 at 6:48am, updated Thu 9 Jan 2020 at 2:53pm

Bushfire smog advice: stay in, avoid outside exercise
If you must wear a mask, get one that works
🔗 canberratimes.com.au

Will Sydney's bushfire smoke pollution have long-term health effects?

By Ruby Prosser Scully

Sydney residents are taking precautions against air pollution

How to maintain your fitness and keep active as our air quality plummets

ABC Health & Wellbeing / By health reporter Olivia Willis
Posted Wed 18 Dec 2019 at 6:06am

https://www.newscientist.com/article/2227070-will-sydneys-bushfire-smoke-pollution-have-long-term-health-effects/
Eden: 31 Dec 2019
Eden to Canberra: 2 Jan 2020
# Air quality and pollution city ranking

02 January 2020, 15:39

<table>
<thead>
<tr>
<th>Major city</th>
<th>US AQI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  🇦🇺 Canberra, Australia</td>
<td>510</td>
</tr>
<tr>
<td>2  🇮🇳 Delhi, India</td>
<td>455</td>
</tr>
<tr>
<td>3  🇲🇳 Ulaanbaatar, Mongolia</td>
<td>412</td>
</tr>
<tr>
<td>4  🇵🇰 Lahore, Pakistan</td>
<td>272</td>
</tr>
<tr>
<td>5  🇨🇳 Shenyang, China</td>
<td>244</td>
</tr>
<tr>
<td>6  🇳🇵 Kathmandu, Nepal</td>
<td>235</td>
</tr>
<tr>
<td>7  🇮🇩 Kolkata, India</td>
<td>194</td>
</tr>
<tr>
<td>8  🇮🇳 Mumbai, India</td>
<td>177</td>
</tr>
</tbody>
</table>
Communication

Health concerns amid prolonged air pollution from fires

Duration: 03:10  3/9/2020
10 Things You can do to Protect Yourself and Others from Bushfire Smoke

1. Stay indoors
2. Medication plan
3. Reduce physical activities outdoors
4. Face masks
5. Trust your senses
6. Keep well
7. Take care of mental health
8. Follow bushfire and news advice
9. Follow air quality information
10. Help others

https://rsph.anu.edu.au/phxchange/communicating-science
ASK FOR HELP
https://rsph.anu.edu.au/ask

TAKE CARE OF YOUR AND OTHER'S MENTAL HEALTH AFTER BUSHFIRES

Translating resources to save lives

15 SEPTEMBER 2020

WHAT IS BUSHFIRE SMOKE AND HOW HARMFUL IS IT?

ควันไฟป่าคืออะไรและอันตรายแค่ไหน
Podcasts for Health Professionals

Medical Journal of Australia


Australian Healthcare & Hospitals Association

AHHA @AusHealthcare · Feb 18
AHHA introduces a two-part podcast series discussing the impact of bushfires on Australia's health. In the 1st episode, environmental health expert @SotirisVard @scienceANU discusses the impact of bushfire smoke on our health @DeebleInstitute @ANUmedia soundcloud.com/ahhapodcast/bu...
Health Evidence

• Air quality monitoring
• Lung function effects
• Pregnancy outcomes
• Mental health impacts
• Bushfire health survey
We wanted to go out and play

The world outside was dark and gray

but mummy said “not today”

we wish the smoke would go away!

Erin Walsh
Climate Change

Forest Fire Danger Index

(CSIRO, 2020)
1 min video snapshot on how climate change has contributed to Australia’s unprecedented 2019/20 fire season & how we can respond. Join us at #ClimateUpdateMelb on 12/3 w experts from @RMIT_CUR @RMIT & @ourANU @LaurenARickards @ProfMarkHowden @SotirisVard bit.ly/2TKP9vH
Advocacy – Bushfire Impact Working Group

• Royal Commission into National Natural Disaster Arrangements
• Senate Inquiry into lessons to be learned in relation to the Australian bushfire season 2019-20
Engagement

Preventing chronic disease by promoting exercise and healthy food

News

Australians are having to become air-quality smart, like being sun smart

15th Jan 20

Asthma Australia @AsthmaAustralia · 8 Jun
We know that during the Black Summer #bushfires, anxiety levels were heightened - impacted not only peoples #asthma but their overall health and well-being.

Read survey findings here bit.ly/3h6I8Ar

Read more about emotions triggering asthma bit.ly/2Yemq1c

Bushfire Smoke Impact Survey: Key Finding 3

PERIODS OF BUSHFIRE SMOKE EXPOSURE INCREASES ANXIETY AND DEPRESSION IN PEOPLE WITH ASTHMA
Bushfire smoke: urgent need for a national health protection strategy

More nuanced health advice is needed to protect populations and individuals from exposure to bushfire smoke

Bushfires have always been a feature of the natural environment in Australia, but the risk has increased over time as fire seasons start earlier, finish later, and extreme fire weather (i.e., very hot, dry and windy conditions that make fires fast moving and very difficult to control) becomes more severe with climate change. The 2019–20 bushfires in Australia, particularly in New South Wales, Victoria, Queensland and the Australian Capital Territory, have caused at least 33 fatalities, extensive damage to property and destruction of flora and fauna, and have exposed millions of people to extreme levels of air pollution. Bushfire smoke, as well as smoke from prescribed burns, contains a complex mixture of particles and gases that are chemically transformed in the atmosphere and transported by the wind over long distances. In this context, a major public health concern is population exposure to atmospheric particulate matter (PM) with a diameter < 2.5 μm (PM₂.₅), which can penetrate deep into the respiratory system, inducing oxidative stress and inflammation, and even translocate into the bloodstream. Such exposure can adversely affect health outcomes. Mortality rates have been found to increase in Sydney on days with high bushfire smoke pollution. Hospital admissions, emergency department attendances, ambulance call-outs and general practitioner consultations, particularly for respiratory conditions, have all increased during periods of severe PM₂.₅ levels from bushfires. The risks from air pollution are amplified when combined with high temperatures during heatwaves, with an increased effect on mortality.

There is increasing scientific consensus that climate change is the underlying cause of the prolonged dry and hot conditions that have increased the risk of extreme fire weather in Australia. With persistent droughts and record-breaking temperatures (2019 was Australia’s warmest and driest year on record, http://www.bom.gov.au/climate/current/annual/aus/), it is likely that the extreme bushfires and smoke haze in Australia during the "Black Summer" (the end of 2019 and the beginning of 2020) will be a one-off event. In recent years, other parts of the world, including California, Southern Europe, Southeast Asia, and the Amazon, have also been affected by catastrophic wildfires. We should be better prepared for more frequent and intense bushfire and wildfire events.

The immediate response to wildfires aims to prevent loss of life and may involve evacuation of people living in areas under threat. Although often necessary, evacuations can have health consequences for those who are displaced, particularly the poor and elderly, as was the case after the large-scale evacuations because of Hurricane Katrina in the US.

Away from the forests and towns devastated by the fires, millions of people have been exposed to unprecedented levels of smoke blanketing large parts of eastern Australia over days and even weeks. Sydney, Melbourne, and Canberra, cities with typically good air quality, have experienced record levels of air pollution. The air pollution has been compared with that of the most polluted Asian megacities, and the hazards of personal exposure to bushfire smoke have been compared with the hazards of smoking tobacco. Although

Reflections on the Catastrophic 2019–2020 Bushfires

Bin Jalaludin, Fay Johnston, Sotiris Vardoulakis, Geoffrey Morgan

While fire is an inherent part of the Australian landscape, the bushfires that occurred in eastern Australia from September 2019 to early February 2020 were unprecedented (Figure 1). Bushfires across the nation burned more than 126 million hectares (an area slightly bigger than Belgium, Denmark, and the Netherlands combined), emitted about 400 tonnes of carbon dioxide into the atmosphere (about three-quarters of the country’s total annual carbon dioxide emissions), directly caused at least 33 deaths and over one billion animals were killed (https://www.abc.net.au/news/science/2020-03-05/bushfire-crisis-five-big-numbers/12007776).

In Sydney, the largest city in Australia with a population of about 5.2 million, levels of particulate matter ≤ 2.5 μm in aerodynamic diameter (PM₂.₅ also known as fine particles) exceeded 700 μg/m³ and the average maximum 24-h PM₂.₅ levels from November 2019 to January 2020 (the worst months for the fires) was about 64 μg/m³ (https://www.dpie.nsw.gov.au/air-quality/search-for-and-download-air-quality-data). In a national poll conducted in early January 2020, just over half the respondents (53%) reported experiencing some kind of direct impact from the bushfires.
Summary

- **Communication**: Factsheets, translations, podcasts, media → 8M audience!
- **Engagement**: ACT Health, NSW Health, Commonwealth, PHAA, UnionsACT
- **Leadership & Advocacy**
  - Real-time local air quality data and forecasts
  - Specific, consistent, and accessible health advice
  - National Air Pollution & Health Protection Expert Committee
  - National Strategy for Climate Change and Health
- **Evidence**: Rapid research projects, surveys, publications, funding applications
- **Education**: Student projects, teaching, workshops, seminars
- **Solidarity**: Local community, schools, Aboriginal groups, vulnerable groups
After the fires
what do they mean for Australia?
Acknowledgments

• ACT Health, NSW Health, Commonwealth Health, Public Health Association of Australia, Asthma Australia, CAHA (Climate and Health Alliance), CSIRO, CAR (Centre for Air Pollution, Energy & Health Research), UnionsACT

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• Bin Jalaludin (UNSW), Geoff Morgan (USyd), Ivan Hanigan (USyd), Fay Johnston (UTAS), Guy Marks (UNSW), Michael Abramson (Monash), David Bowman (UTAS)

• All study participants, local schools, volunteers, and interviewees
Thank you!