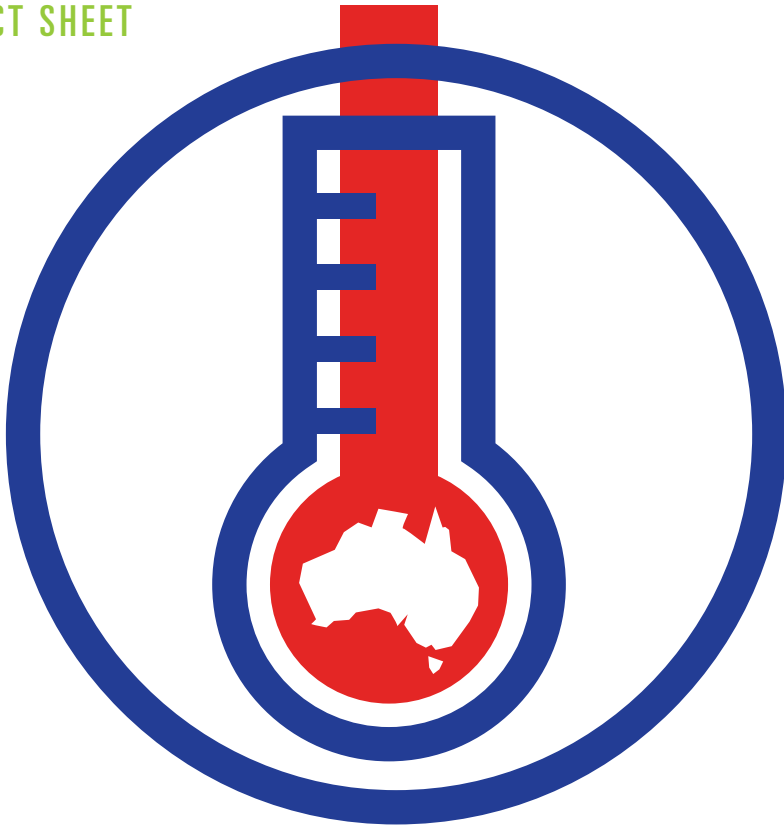


HEATWAVES & HEALTH IN AUSTRALIA

FACT SHEET



A heatwave is described by the Australian Bureau of Meteorology as three or more days of high maximum and minimum temperatures that are unusual for a given location (BOM, 2016). In Australia, heatwaves are becoming hotter, longer and more frequent due to climate change (Reisinger et al., 2014; CSIRO & BOM, 2016). Climate change is a major threat to human health both in Australia and globally, and requires urgent responses to protect health. Doctors for the Environment Australia (DEA) has developed this fact sheet to outline the health impacts of heatwaves, and how to minimise their effects.

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BACKGROUND

Global temperatures have increased due to climate change, with the global average temperature in 2015 rising 0.9°C above the 20th century average. Furthermore, 2015 was the 39th consecutive year with above-average global temperatures (Climate Council, 2016). That trend continues in 2016, with June marking the 378th consecutive month with global temperatures above the 20th century average (Blunden et al., 2015).

In Australia, the 2015 average annual temperature was 0.83°C above the average for the period 1961-1990 (Blunden et al., 2015). The frequency of episodes of extreme heat has increased, and heatwaves have become longer and hotter (CSIRO & BOM, 2016; Steffen et al., 2014). In addition, the number of days per year with temperatures over 35°C has increased in most parts of Australia (CSIRO & BOM, 2016). 2013 was Australia's hottest year on record (CSIRO & BOM, 2016), and in the summer of that

year new colours were added to the weather chart to better represent the unprecedented heat (Carrington, 2013).

Temperatures are expected to continue to increase in the 21st century due to climate change. By 2070, temperatures in Australia will rise by up to 5°C on average, compared with the period 1980-1999 (CSIRO & BOM, 2014). Longer, hotter, more frequent heatwaves are expected (Reisinger et al., 2014; CSIRO & BOM, 2016; Cowan et al., 2014), and by the middle of the century, 1-in-20 year extreme hot days are expected to occur every two to five years (Steffen et al., 2014).

Heatwaves are also a significant contributor to bushfire risk. An increase in extreme fire weather has been observed in large parts of Australia since the 1970s, and fire seasons have lengthened (CSIRO & BOM, 2016). Bushfire risk will continue to rise in the future, with the number of extreme fire-weather days and the duration of the bushfire season expected to increase in southern and eastern Australia (CSIRO & BOM, 2016; CSIRO & BOM, 2014; Hughes & Fenwick, 2015).

HEALTH EFFECTS OF HEATWAVES

Heatwaves have serious effects on human health. Often referred to as a 'silent killer', heatwaves have caused more deaths in Australia over the past 100 years than any other natural event (Steffen et al., 2014). For example, the heatwave that preceded the 2009 Black Saturday bushfires in Victoria resulted in 374 excess deaths (VIC Government, Dept. of Health & Human Services, 2009), in comparison to the 173 tragically killed in the fires themselves (2009 VIC Bushfire Royal Commission, 2010). Across southeast Australia, the 2009 heatwave resulted in a total of nearly 500 excess deaths (Nairn & Fawcett, 2013).



Healthy planet, healthy people

The more direct health effects of heatwaves on health include:

- Heat-related illnesses such as dehydration, heat stress and heat stroke (heat stroke is a medical emergency and life-threatening without prompt treatment). During the 2009 heatwave, emergency departments in Victoria observed an eight-fold increase in direct heat-related presentations (VIC Government, Dept. of Health & Human Services, 2009).
- Exacerbations of pre-existing chronic diseases such as heart, lung and kidney disease. For example, during the 2009 Victorian heatwave there was a 2.8 fold increase in cardiac arrests (VIC Government, Dept. of Health & Human Services, 2009).
- Increased death rates, particularly among elderly people (X Wang et al., 2012; Bi et al., 2011; Hughes et al., 2016).
- There is some evidence to suggest impacts on the risk of preterm birth and underweight babies but further research is needed to confirm (Vicedo-Cabrera et al., 2014; J Wang et al., 2013; Greenstone et al., 2013).

The more indirect health effects of heatwaves on health are varied and include:

- Impacts on health services, such as increased pressure on ambulance and emergency services, and increased hospital admissions (Schaffer et al., 2012; Turner et al., 2013; Xu et al., 2013; Toloo et al., 2014). For example, a 14% increase in ambulance callouts was observed during a heatwave in Sydney in 2011 (Schaffer et al., 2012), while a 7% increase in hospital admissions has been observed in Adelaide during heatwaves (Nitschke et al., 2007). During the 2009 heatwave, Ambulance Victoria observed a 25% increase in total metropolitan emergency cases, with a 46% increase observed over the three hottest days (VIC Government, Dept. of Health & Human Services, 2009).
- Increased vulnerability to workplace accidents and injuries (Bi et al., 2011; Singh et al., 2013; Hanna et al., 2011).
- Effects of power outages, which are more common during heatwaves. These include increased risk of gastrointestinal infections (such as Salmonella gastroenteritis) due to food spoilage associated with

the failure of refrigeration and air-conditioning systems, and interruption to the supply chain for medicines and vaccines, many of which require refrigeration.

- Increased levels of air pollutants such as ground-level ozone, which can exacerbate heart and lung disease. Bushfires also have negative effects on air quality through the production of particulate matter and noxious gases.
- Interruption to transport services, with effects on supply chains, businesses and community services that are central to health.
- Effects of prolonged heat and the associated social and community disruption on mental health (Hansen et al., 2008; Berry et al., 2010). For example, an increase in hospital admissions for mental health problems has been observed in Adelaide during heatwaves (Hansen et al., 2008).

These effects are associated with significant health care costs and place a substantial burden on the Australian health care system during these periods.

WHO IS MOST VULNERABLE?

Periods of extreme heat can affect everyone. However, some people are more vulnerable to the health impacts of heatwaves than others.

Vulnerable groups include:

- Children, as they are more susceptible to heat stress and dehydration.
- The elderly, who are more prone to dehydration and exacerbations of chronic conditions, and more likely to take medications that promote fluid loss or interfere with thermoregulation.
- Pregnant women, with the physiological demands of pregnancy increasing the risk of heat stress.
- People with disabilities, and those with pre-existing medical problems, such as heart, lung and kidney disease, diabetes, and mental health problems.
- People living alone, and those who are otherwise socially isolated, and those who may not have access to or be able to understand public service announcements.
- People more likely to be exposed to extreme heat such as those

participating in outdoor recreational activities or the homeless.

- People belonging to lower socio-economic groups, due to higher rates of chronic disease and reduced capacity to adapt behaviour or circumstances in response to weather conditions.
- People living in cities, due to the 'urban heat island effect' whereby urban structures trap and maintain heat.
- Outdoor workers and those working in enclosed indoor areas, for example farmers, construction workers, and people working in emergency and essential services.

PROTECTING YOUR HEALTH DURING HOT WEATHER

It's important that all members of the community take steps to ensure they are safe during periods of hot weather. Doctors, nurses and other care providers can help educate the community on ways to prevent heat-related illness.

General advice from health authorities (see links below) is:

- Stay cool, for example by staying inside during the hottest part of the day, typically 11am to 3pm.
- Keep well hydrated - chilled tap water is generally the best choice.
- Dress in light-coloured, loose-fitting clothing.
- Limit or modify physical activity, particularly for outdoor workers.
- Stay in contact with others, particularly those who live alone.
- Keep an eye on vulnerable people, such as elderly friends, neighbours and relatives.
- Seek advice from a health professional particularly for the elderly and those with medical problems.
- Avoid factors that may increase the risk of heat-related illness, such as alcohol consumption, prolonged physical exertion, and use of certain medications (speak to a GP or pharmacist for more information).

It is recommended that community members, particularly those at increased risk of heat-related illness, seek personalised advice from their doctor or other health care provider.

WHAT CAN BE DONE?

Climate change will mean hotter, longer, more frequent heatwaves in Australia, with profound implications for health and significant associated costs.

Doctors for the Environment

Australia calls for:

- Urgent action to mitigate climate change, including a rapid transition to renewable energy, to help lessen the risk of extreme weather events and associated health impacts. The Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC) paves the way for ambitious action to protect the earth from catastrophic climate change. The Agreement is an international pledge to keep temperatures well below 2°C above pre-industrial levels, and with efforts to limit the temperature increase to 1.5°C. However, Australia's greenhouse gas mitigation policies are currently inadequate to limit global warming to 1.5°C, and must be revised to align with international commitments.
- Improved planning and coordination of responses to the health effects of climate change, to minimise adverse health outcomes for all Australians.

Without swift action to transition to renewable energy and leave fossil fuels in the ground, climate change will cause major changes to the Earth's weather, including the increasing risk of heatwaves and bushfires in Australia. Given the profound impacts of these events on human health, it is vital that urgent steps are taken to limit anthropogenic climate change, and to anticipate and respond to its effects.

MORE INFORMATION

GENERAL

- Heatwave service for Australia (Bureau of Meteorology)
<http://www.bom.gov.au/australia/heatwave/index.shtml>
- The silent killer: Climate change and the health impacts of extreme heat (Climate Council)
<https://www.climatecouncil.org.au/uploads/b6cd8665c633434e8d02910eee3ca87c.pdf>
- Climate change and health in Australia fact sheets (Doctors for the Environment Australia)
<http://dea.org.au/resources/file/climate-change-and-health-in-australia>
- Hot weather risks and staying cool (Healthdirect)
<http://www.healthdirect.gov.au/hot-weather-risks-and-staying-cool>
- Heatwaves – community resources (Victoria State Government Health and Human Services)
<https://www2.health.vic.gov.au/public-health/environmental-health/climate-weather-and-public-health/heatwaves-and-extreme-heat/heatwave-community-resources>
- Stay healthy in the heat (SA Health)
<http://www.sahealth.sa.gov.au/wps/wcm/connect/public+content/sa+health+internet/healthy+living/protecting+your+health/stay+healthy+in+the+heat/stay+healthy+in+the+heat>
- Heat (Government of WA Department of Health)
http://healthywa.wa.gov.au/Articles/F_I/Heat
- Beat the heat (NSW Health)
<http://www.health.nsw.gov.au/environment/beattheheat/pages/default.aspx>
- Staying healthy in the heat (Queensland Health)
<https://www.health.qld.gov.au/disaster/heat/heat-wave.asp>
- Heatwave action guide (Tasmania State Emergency Service)
<http://www.ses.tas.gov.au/h/em/awareness/heatwave>
- Heatwaves (Northern Territory Emergency Service)
<http://www.pfes.nt.gov.au/Emergency-Service/Public-safety-advice/Heatwaves.aspx>

FOR HEALTH PROFESSIONALS

- Heatwaves – advice for clinicians (Victoria State Government Health and Human Services)
<https://www2.health.vic.gov.au/public-health/environmental-health/climate-weather-and-public-health/heatwaves-and-extreme-heat/heatwaves-advice-for-clinicians>
- Emergency preparedness in residential aged care – heat health (Victoria State Government Health and Human Services)
https://www2.health.vic.gov.au/~media/health/files/collections/policies%20and%20guidelines/r/resi_heatwave_2013.pdf
- Information for health professionals (NSW Health)
<http://www.health.nsw.gov.au/environment/beattheheat/Pages/information-for-health-professionals.aspx>
- SA Health Extreme Heat Strategy (SA Health)
<http://www.sahealth.sa.gov.au/wps/wcm/connect/33e7f9004708784eb87ff822d29d99f6/14165.1+Strategy+ReportV3.pdf?MOD=AJPERES&CACHEID=33e7f9004708784eb87ff822d29d99f6>

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