



EXTREME HEAT AND THE RISK TO YOUR HEALTH

an article for health practitioners



Government
of South Australia

SA Health

By Dr M Nitschke from SA Health; and Dr A Hansen, Dr S Williams and Professor P Bi from the Discipline of Public Health, University of Adelaide. First published in medicSA, May 2017.

This article focuses on extreme heat and its associated health effects, while summarising the evidence gathered during collaborative studies between SA Health and the University of Adelaide over many years.

Stay healthy in the heat: advice for the general public

- > Drink plenty of water, avoid caffeine and alcohol
- > Stay inside with air conditioner or fan on
- > Use cold packs, water sprays and wet towels to cool down
- > Keep out of the sun
- > If you have to go outside or exercise, go early in the morning or late evening
- > Wear light coloured, loose clothing and a hat. Use sunscreen
- > Keep curtains, blinds and windows closed during the day
- > Check on older people, especially if they live alone
- > If you regularly take medicines, check with your doctor about whether they will affect what you should do when it gets very hot
- > Older people can register with the Red Cross and a volunteer will call three times a day to check if they are ok. Register by calling 1800 188 071 or see information on Telecross REDi.

Further information:

www.sahealth.sa.gov.au/HealthyInTheHeat

The summer of 2016-17 was Australia's twelfth hottest summer on record. While in South Australia this summer was not spectacularly hot, previous summers have been marked by heatwaves of long duration and extreme temperatures. Consistent with global warming, the Bureau of Meteorology this year reported annual average warming of around one degree since 1910, consistent with warming observed for the globe. An increase in the mean temperature leads to more record hot temperatures in summer, requiring ongoing preparation for extreme heat periods in years to come.

The article provides evidence-based information on the impacts and risk factors during heatwaves based on local research, highlighting the people at risk and the susceptibility factors that have contributed to their risk. It will offer food for thought for next year's hot season and gives information that may help to identify potentially vulnerable people who could benefit from some form of intervention when heatwaves are predicted.

The health impact on people depends on the severity of the heatwave. In the absence of a formal definition, a heatwave in metropolitan Adelaide has been defined as a maximum temperature of 35°C or above, for three consecutive days or more. This temperature falls into the 95th percentile of the maximum temperature measurements recorded between 1993 and 1995.

Using this definition and comparing non-heat wave periods to heatwave periods in summer, during heatwaves in metropolitan Adelaide, total hospital admissions increase by 4%, ambulance call-outs increase by 4% and emergency presentations increase by 1%. However, during the 2009 unprecedented extreme heatwave, admissions to hospitals increased by 8%, ambulance call-outs by 16% and emergency presentations by 2%. While no increase in mortality had been observed in earlier heatwaves, in 2009, total mortality increased by 10% (excess death of 32 people), and in 15 to 64 year olds mortality increased by 37% during the heatwave. With predicted increases in the number and intensity of heatwaves in South Australia, these figures are concerning.

During the 2009 extreme heatwave, impacts were observed in health outcomes as documented by specific ICD-10 admission codes. These included renal disease (ICD-10, N00-N399), ischaemic heart disease (ICD-10, I20-I25 which includes angina, acute myocardial infarct and its complications and chronic ischaemic heart disease) and health effects of direct heat. The latter incorporates admission codes for dehydration, heat and sunstroke, and exposure to excessive heat and light (ICD-10 E86, T67, X30).

Direct heat related hospitalisation in total increased 14 fold in 2009 compared to non-heat wave periods leading to 215 extra cases during the 13 days of the 2009 heatwave, with the highest increase seen in the 75+ age group (137 extra cases).

The highest increase in mortality was due to causes of direct heat, particularly in the 75+ age group, followed by ischaemic heart disease related mortality in 15 to 64 year olds and stroke-related in 65 to 74 year olds.

The specific health-outcome ICD-10 categories affected by heat are not surprising, considering the physiology involved. Regulation of body temperature at ambient temperatures in excess of 35°C is only possible using evaporative thermoregulation (sweating), which requires major input from the cardiovascular and renal system, and can be impeded by behaviour, age, medication, cognitive impairment and pre-existing chronic diseases.

Additionally, there are social and environmental risk factors which exacerbate health impacts in vulnerable populations. A number of epidemiological studies have explored risk factors retrospectively using electronic hospital data, case records, surveys, and interviews with people or their next of kin whose health was adversely affected, particularly during the 2009 heatwave in Adelaide.

The table (right) summarises the evidence collected through local research. The results show that people with pre-existing chronic disease (particularly renal, cardiovascular or mental health problems), those who need assistance in daily life, or use mobility aids, and people with limited social connectivity or who live alone are at greater risk during extreme heat. On the other hand, research shows that keeping up regular social contact, wearing light coloured and loose clothing, using air conditioners in bedrooms, taking refreshments to cool down and living in residential care improves outcomes for vulnerable people during periods of extreme heat.

General practitioners could play an important role in significantly improving health outcomes of vulnerable patients by taking a proactive approach before and during extreme heat conditions. This could include systematically identifying and alerting vulnerable patients and their carers, including the elderly, parents of young children and infants and patients with chronic disease. Relevant advice is summarised in the box – Stay healthy in the heat.

Advice should take into account chronic disease status, any medication that could influence thermoregulation, and an individual's living circumstances and social support, and should focus on behaviour change that assists cooling.

Risk factors

Medical factors

Pre-existing heart, renal or mental (depression, dementia) morbidity

Taking medication for the above

People who have had falls

People with self-assessed reduced health status

Use of mobile aids

Social and environmental factors

Living alone

Reduced social contacts and support

Need of assistance in daily living or using community services

Socio-economic disadvantage

Protective factors

Air conditioning in bedroom

Increased use of refreshments

Social support network

Having an emergency button

Living in residential care

Higher educational attainment



Following the extreme heat wave of 2009, a heat warning system (HWS) and specific interventions were implemented in South Australia. An evaluation of heat-health impacts in Adelaide following the introduction of the HWS indicates significant reductions in morbidity. Adaptive heat health messages, activation of extreme heat plans across the Government, Red Cross support calls to vulnerable people (Telecross RED), engagement with culturally and linguistically diverse communities (CALD) and relevant clinical responses may have contributed to this success.

Further research papers on heat and health:
www.sahealth.sa.gov.au/healthyintheheat

