

THE HEAT IS ON ... AND HAS BEEN FOR A WHILE, NEW RESEARCH SHOWS



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A PAPER ANALYSING THE HISTORICAL IMPACTS OF EXTREME HEATWAVES IN AUSTRALIA HAS BEEN ONE OF THE FIRST OUTPUTS OF A PROJECT TO MEASURE AND UNDERSTAND THE IMPACTS OF NATURAL HAZARDS IN TERMS OF HUMAN HEALTH AND BUILDING DAMAGE.

EXTREME HEATWAVE EVENTS IN AUSTRALIA

Australian heatwaves have been under-represented in policy considerations for emergency management. A recently published study of extreme heat events from 1844-2010 by Risk Frontiers raises significant implications in view of a warming climate and ageing population.

“Earlier studies by Risk Frontiers suggested that, with the exception of disease epidemics, extreme heat events had been the most significant natural hazard in Australia in terms of loss of life,” said lead author, Lucinda Coates. “However, despite their importance in terms of human mortality, such events have not attracted the same level of study as other natural hazards in regards to vulnerability and implications for emergency management and policy change.”

This study employed PerilAUS – Risk Frontiers’ database of natural hazard event impacts - to provide a lower-bound estimate of heat-associated deaths in Australia since European settlement.

Key findings included:

- ▶ Definitional confusion & inconsistencies in defining “heatwave”-related deaths over time have made determining an absolute death toll problematic.
- ▶ From 1844-2010, extreme heat events have been responsible for at least 5,332 fatalities in Australia.
- ▶ Since 1900, at least 4,555 deaths have occurred: more than those from all other natural hazards.

- ▶ Over 30% of those deaths occurred in just nine events.
- ▶ Deaths and death rates show an overall decrease with time.
- ▶ There is significant over-representation of seniors and infants.

Deaths and death rates

The decadal death rate has fallen from 1.69 deaths per 100,000 population in the 1910s to 0.26 in the 2000s. This decrease can be attributed to a variety of factors: fewer people working outside, a better-informed public, greater freedom of dress and improvement in utilities & services -- home cooling, access and breadth of health services including aged care services, warning systems and rescue services.

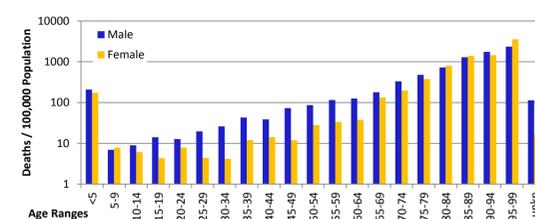
Comparison with other Australian natural hazards

Extreme heat has been responsible for ~55% of all listed natural hazard fatalities recorded in PerilAUS from 1900 to 2011, more than *all* other listed hazards put together!

Natural hazard	Deaths	% total deaths
Extreme heat	4,555	55.2
Cyclone	1,285	15.6
Flood	1,221	14.8
Bush/ grassfire	866	10.5
Landslide	88	1.1
Lightning	85	1.0
Wind storm	68	0.8
Tornado	42	0.5
Hail storm	16	0.2
Earthquake	16	0.2
Rain storm	14	0.2

Sex/ Age trends

Males have been most at risk. The male:female death rate ratio has fluctuated over time and approaches but does not reach equality. Males have been most exposed to the elements, especially with regard to farming, mining and labouring. But overriding other risk factors is the vulnerability that comes with being old and, to a lesser extent, very young.



Public education and emergency management is important in planning for extreme heat, but long term risk reduction must consider community development, building design, urban planning and social equity.

FUTURE WORK

PerilAUS will be refined with BoM data and further explored with a heatwave index applicable across Australia, to better determine trends in fatalities across different regions.

COMMENT FROM LEAD END-USER

Population growth in our cities will require significant adaptation to reduce the impacts from future heatwaves. Climate and urban heat island modelling nationally will draw significant benefits from linkages with this project -- *Simon Opper, NSW SES.*

REFERENCE

Coates, L, Haynes, K, O'Brien, J, McAneney, KJ, Dimer de Oliveira, F (2014) Exploring 167 years of vulnerability: an examination of extreme heat events in Australia 1844-2010. *Environmental Science and Policy* 42, 33-44. DOI: 10.1016/j.envsci.2014.05.003

