



# **Population Health and Climate Change: Public Perceptions, Attitudes and Adaptation to Heat waves in Adelaide, Australia**

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## LIST OF ACRONYMS AND ABBREVIATIONS

<b>Acronyms</b>	<b>Abbreviations</b>
ADT	Average Daily Temperature
BoM	Bureau of Meteorology
CALD	Culturally and Linguistically Diverse
CI	Chief Investigator
CO <sub>2</sub>	Carbon dioxide
CSIRO	Commonwealth Scientific and Industrial Research Organisation
°C	Degrees Celsius
Dr	Doctor
ED	Emergency Department
EU	European Union
HBM	Health Belief Model
HWS	Heat Warning System
IPCC	Intergovernmental Panel on Climate Change
MSP	Multi-stakeholder processes
NWAHS	North West Adelaide Health Study
PhD	Doctor of Philosophy
Prof	Professor
SA	South Australia
SES	State Emergency Service
SMS	Short Message Service
SRES	Special Report on Emission Scenarios
TV	Television
UHI	Urban Heat Island
UK	United Kingdom
USA	United States of America



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## DECLARATION

I certify that this work contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text.

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Akompab, D., Bi, P., Williams, S., Grant, J., Walker, I. & Augoustinos, M. 2013, 'Awareness of and attitudes towards heat waves in the context of climate change among a cohort of residents in Adelaide, Australia', *International Journal of Environmental Research and Public Health*, vol. 10, no. 1, pp. 1-17; doi:10.3390/ijerph10010001.

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## LIST OF PUBLICATIONS/MANUSCRIPTS CONTRIBUTING TO THIS THESIS

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## THESIS ABSTRACT

**Background and objectives:** There is compelling scientific evidence that climate change will increase the frequency of heat waves which have an impact on population health. In Adelaide, unprecedented heat waves have been experienced in recent years which had significant impact on human health. The objectives of this research project were to: (1) explore public opinion (views and attitudes) about heat waves in relation to climate change, (2) explore public understanding of the consequences and the emotional and psychological responses associated with heat waves, (3) identify the predictors of risk perception using a heat wave scenario and adaptive behaviours during heat waves; and (4) explore the concept of multi-stakeholder processes during the development of an adaptation strategy for heat waves.

**Methods:** In the first study, interviews were conducted among fourteen residents to explore their views about heat waves, their understanding of its consequences and the emotional and psychological responses associated with heat waves. The second study was a cross-sectional study that examined the attitudes towards heat waves, risk perception and adaptive behaviours during heat waves among 267 participants with the health belief model used as the theoretical framework. The third study explored the concept of multi-stakeholder processes during the development of an adaptation strategy for heat waves. Data were gathered through a review of policy documents and interviews with eighteen stakeholders involved in the strategy development process. Qualitative data were analysed according to themes while descriptive and inferential statistical techniques were used to analyse quantitative data.

**Results:** In the first study, most participants didn't associate recent heat waves in Adelaide with climate change, although they acknowledged a considerable change in weather patterns over recent years. Although there were differences in the level of understanding among the participants, they modified their behaviours during a heat wave. Fear, worry, anxiety and concern were the main emotional responses associated with heat waves. Participants were concerned about low agricultural productivity, the costs of running an air-conditioner, sleeping well, and the threat of bush fires during a heat wave. In the second study, there was a significant association between gender, annual household income and concern for the societal effects of heat waves. About 43.2% of the participants believed that heat waves will extremely or very likely increase in Adelaide according to climate projections; 49.3% believed that the effects of heat waves were already being felt. The significant predictors of risk perception included age, marital status, annual household income, fan ownership and

living arrangements. Participants' perceived benefit, cues to action, educational level, and annual household income were associated with adaptive behaviours during a heat wave. In the third study, there was high level governance, leadership, collaboration, coordination and good institutional arrangements during the adaptation strategy development process in South Australia. The process benefited from the Emergency Management Act 2004, which facilitated an enabling environment. Although the process was not entirely inclusive and the fact that it experienced a few challenges, the strategy development process was overall successful.

**Conclusions:** These findings suggest that there are variations in public opinion about heat waves in the context of climate change. Heat waves affect the emotional and psychological wellbeing of certain individuals. Using the health belief model as the theoretical framework, perceived benefit and cues to action predicted good adaptive behaviours. There were some demographic factors that were associated with risk perception in relation to heat waves. These factors would inform risk communication and behaviour change strategies for heat waves. An adaptation policy process for heat waves indicates that the process can be successful through a participatory process characterised by good leadership, excellent coordination, governance and institutional framework.

**Key words:** Climate change, human health, heat waves, mental models, health belief model, risk perception, adaptive behaviours, stakeholder engagements, Australia