

Geographic variations in public perceptions & responses to heat & heatwave warnings

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ABSTRACT

Introduction: One of the most dangerous natural hazards for population health in Australia is extreme heat, particularly for vulnerable groups. Excessive and prolonged exposure to heat can cause heat stroke, heat exhaustion, heat syncope, heat cramps, and exacerbate a number of medical conditions. The experiences of regional and rural populations is an underrepresented issue in the literature on heatwaves, and there is very little research that focuses on comparisons between differing climate regions. This study aims to examine attitudes and perceptions to extreme heat and heat warnings in regional South Australia, and how this may be influenced by climate region. Understanding how populations in diverse regional areas understand and perceive their risk is vital in understanding where public health action and policy must be aimed.

Methods: Existing data from a householder survey conducted in non-metropolitan South Australia ($n=251$) was analysed using Pearson's Chi-Squared test, with a Fisher's exact test for validation of results. Significance was determined at $p<0.05$. The population sample was coded into three climate regions (hot, warm, and mild) for comparative analyses.

Results: There were a number of findings with significant associations. In the hot and warm zones respondents were more likely to indicate that they have experienced extreme heat or heatwaves *often* (63.2% in hot zone and 66.7% in warm zone) in recent years, compared to sometimes. The hot zone also had the highest proportion of respondents reporting an *increase* (32.4%) in heatwaves or extreme heat in recent years, followed by the mild zone (25%). The warm zone had the highest proportion of respondents observing a *change* (17.1%). Respondents in the hot zone were also more likely to agree that their own actions can reduce the risk that heatwaves present to them and their families (83.8% *strongly agree* or *agree*), and were also more likely to agree with a statement that there will be serious health consequences in their community due to heatwaves in the future (86.5% *strongly agree* or *agree*).

Recall of health warnings during heat events in recent years was high across all climate regions (average 89.3%). Of those householders that did recall warnings, the majority did take the warnings *very seriously* or *seriously*. A small proportion in the warm and mild zones did not take the warnings seriously at all (13.8% and 5% respectively). Those in

the mild zone were least likely to change their behaviour as a result of the warnings, with 28.6% reporting no change in behaviour.

Discussion: The study findings suggest that populations in cooler zones may be underestimating their risk of negative health outcomes due to heatwaves. This is of concern as heatwaves are expected to increase in frequency and magnitude with the increasingly discernible effects of climate change. Householders in the hot zone tend to be more aware of the dangers and risks posed by heatwaves, and were more likely to change their behaviours and take warnings seriously. Despite higher levels of exposure to extreme heat, they have adapted their behaviours and attitudes to protect themselves.

There was a high level of heat warning recall across all climate regions, with a general consensus that the warnings were appropriate. This indicates that warnings are being disseminated through appropriate channels, however a small proportion of the population may be at greater risk if these messages are not being delivered.

This study was limited by the small sample size, with some variation in age and sex population profiles across the three climate zones. There is also the possibility of other confounding factors or mediators, such as socio-economic status, affecting the results.

Conclusion: It is important to examine attitudes and responses to heat warnings in regional and rural populations because the interventions and policies developed for urban settings will not always be appropriate in other contexts. Policies and interventions need to be tailored for these communities in order to better communicate messages for better health and resilience. Climate also needs to play a role in the development of interventions, as it is clear that in some climate regions the attitudes of some community member's may be placing themselves and their families at risk due to their underestimation of the dangers of extreme heat or heatwaves. There is a need for further research into regional and remote populations on a national level, with a focus on the role of climate on adaptation, attitudes, and responses.

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