

## MEASURING HEALTH OUTCOMES OF CLIMATE SERVICES

# BUILDING EVIDENCE THAT EFFECTIVE HEAT ALERT SYSTEMS SAVE LIVES IN SOUTHEAST AUSTRALIA

Authors: N. Nicholls, M. Loughnan, N. Tapper (School of Earth, Atmosphere and Environment, Monash University, Australia).

### CONTEXT

Record heat waves in southeast Australia in January 2009 and January 2014 led to an increase in mortality and morbidity, in excess of the rates expected for the time of the year. Both heat waves recorded daily maximum temperatures well in excess of 40°C over three- and four-day periods respectively, and minimum temperatures above 25°C, with both heat waves concluding on Fridays.

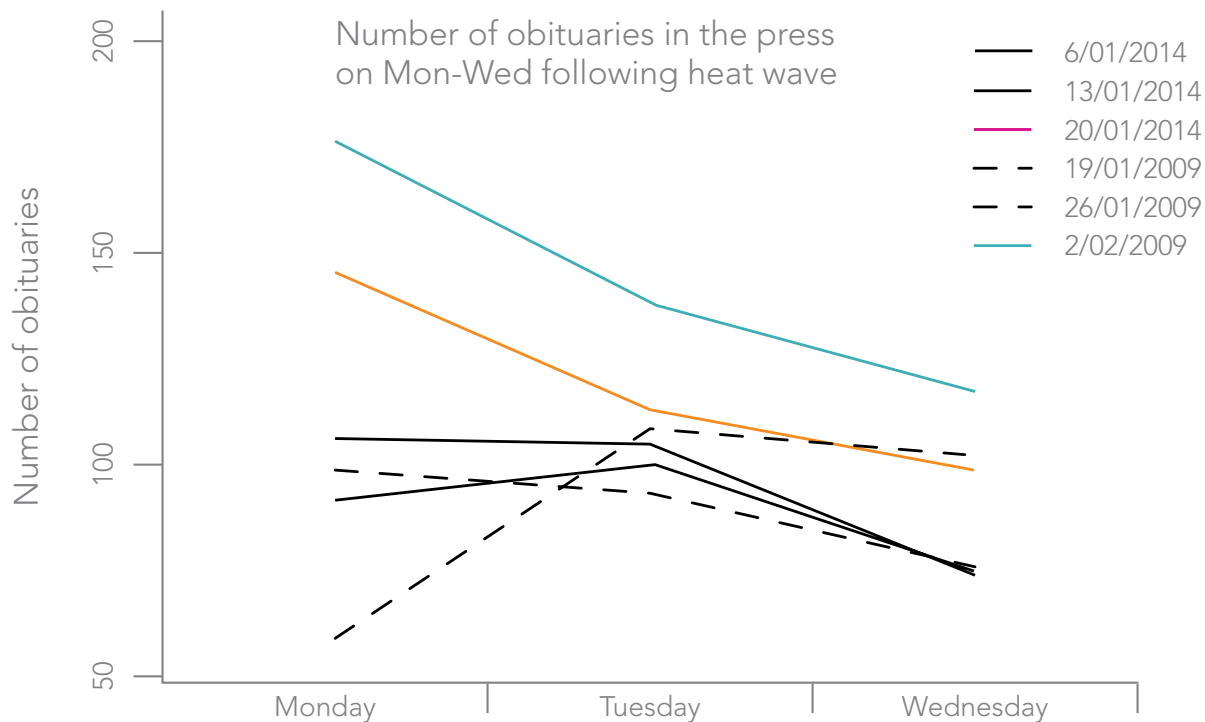
### NEW APPROACHES

In the January 2009 heatwave, a prototype heatwave alert system had just been introduced, based on research identifying a threshold temperature above which excess mortality occurred in Melbourne, Australia (1). By the time of the January 2014 heat wave, the heat alert system had been considerably refined, based on further scientific work (2–4) and intense interactions between climate scientists and public health authorities. The excess mortality associated with the 2014 heat wave was substantially lower than in 2009, even though the 2014 heat wave lasted longer.

### BENEFITS AND LESSONS

The mortality associated with the two heat waves is illustrated in Figure 7.1, which shows the number of obituaries published in a major Melbourne newspaper on the Monday–Wednesday after the two heat waves. In the days after the 2009 heat wave deaths increased by 60% (blue line), relative to the weeks before and after the heat wave (the numbers of obituaries for these weeks are shown by black broken lines). After the 2014 heat wave, deaths increased by 25% (orange line), relative to the mortality in the weeks before and after (shown by the black full lines). The only substantial difference between the two heat wave events was the better-developed and implemented heat wave alert system in 2014. This suggests that the heat wave alert in 2014 saved many lives.

**Figure 7.1** Number of post-heat wave obituaries in the press, 2009 and 2014.



**ACKNOWLEDGEMENTS**



The heat alert system relies on predicted daily temperatures routinely provided by the Bureau of Meteorology. When the temperature at any time in the next seven days is predicted to exceed the threshold identified as triggering excess mortality, a heat wave alert is issued to local government authorities, emergency services, the health and aged care sectors, government departments and agencies, and major metropolitan service providers (5). Media briefings also alert the general community to the actions that could be taken to minimize health risks associated with high temperatures. The recently increased quality of the temperature forecasts issued by the Bureau of Meteorology in Australia means that these forecasts provide credible warning of heat waves (6). This increased forecast quality, and the introduction of heat wave alert systems, have come at an important time, as record heat waves become more frequent and severe. Without the improved weather forecasts and the scientific work to develop credible heat wave alert systems, continued global warming will lead to excess deaths (7).

# REFERENCES

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