

The impacts of heat on emergency department presentations in Victoria, Australia



Tilda Thomson, Joshua Szanyi & Vanora Mulvenna (Department of Health, Victoria)

Elevated temperatures and **extreme heat events** such as heatwaves are associated with **morbidity** and **mortality**, with people at extremes of age and those with pre-existing medical conditions at particularly high risk. It is anticipated that the **health impacts of heat will grow** as anthropogenic climate change increases the incidence, magnitude and duration of extreme heat events.

Methods

Between 2010 and 2022, the Victorian Department of Health issued **“heat health alerts”** when the temperature forecast met or exceeded pre-defined thresholds. In this study, we aimed to analyse the associations between these alerts and **cause-specific emergency department (ED) presentations** among individuals aged **65 years and over** in Victoria.

Heat health alert and public hospital ED data (1 November 2010 to 31 March 2022) were obtained from the Victorian Department of Health. We used a space-time-stratified case-crossover design. For each weather forecast district, case periods were defined as the day of and the day after a heat health alert, matched to control periods (same day of the week, month, and year). Conditional logistic regression was used to generate **odds ratios (ORs) for ED presentations among ≥65-year-olds** on case v. control periods for a set of International Classification of Diseases 10th Revision (ICD-10) codes selected a priori based on a review of the international published literature.

Results

There were 369 heat health alerts issued in Victoria during the study period, corresponding to 572 and 1,521 weather forecast district-specific case and control days respectively. Case periods were associated with elevated odds of **volume depletion** (OR 1.57, 95% confidence interval [CI] 1.41 to 1.74) and **heatstroke/sunstroke** (OR 1.73, 95% CI 1.47 to 2.03). Case periods were also associated with increased odds of a range of other conditions including **chronic obstructive pulmonary disease** (OR 1.09, 95% CI 1.03 to 1.16), **diabetes-related conditions** (OR 1.27, 95% CI 1.06 to 1.53), **organic mental disorders** (OR 1.17, 95% CI 1.07 to 1.28), and **acute renal failure** (OR 1.27, 95% CI 1.15 to 1.42).

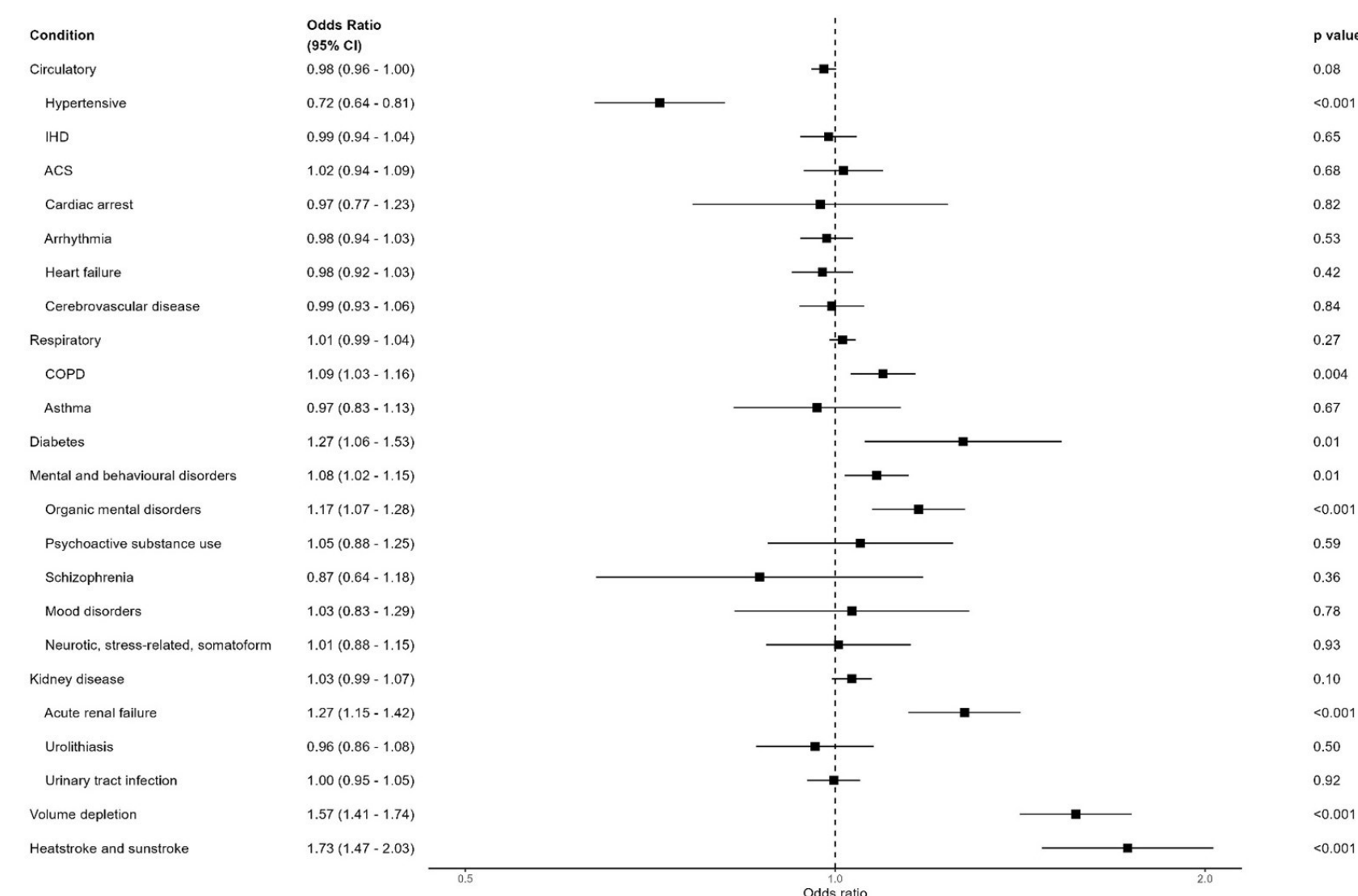


Figure 1: Odds ratios associated with cause-specific emergency department presentations among ≥65-year-olds in Victoria on case (heat health alert) v. control periods, November 2010 to March 2022.

Conclusions

These results suggest that **extreme heat impacts the risk of morbidity across several organ systems** for ≥65-year-olds in Victoria. This highlights the importance of **heatwave forecasting** and **warning systems**, proactive **communications** targeted at at-risk groups and their carers and **health service preparedness**.