

Observed ischaemic heart disease admission rate responses to more extreme temperature and humidity conditions in the Northern Territory, Australia

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Background

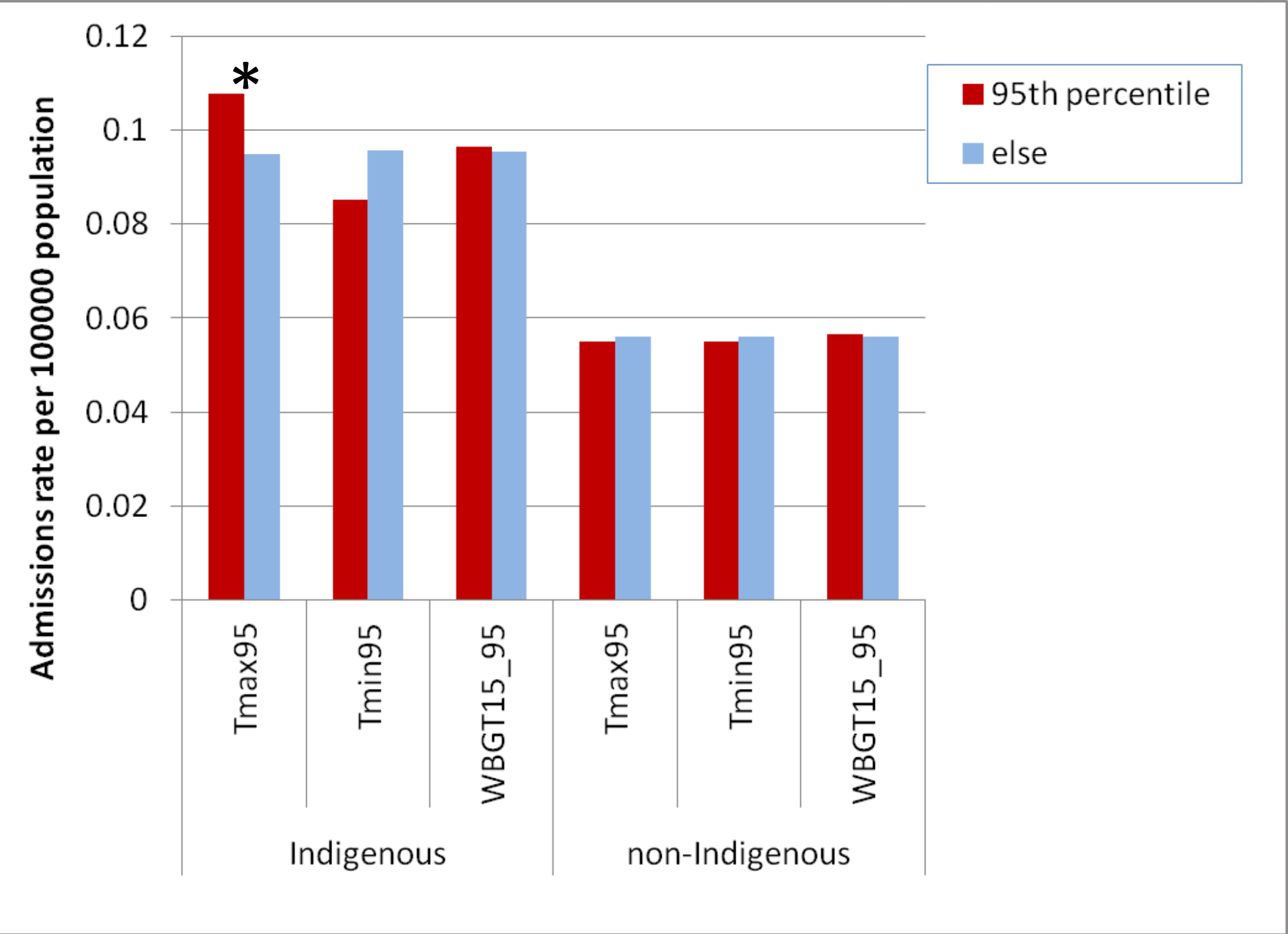
The Australian Indigenous population suffers a higher prevalence of chronic health problems, which includes cardiovascular disease. Increases in cardiovascular disease admissions have been associated with higher temperatures, though studies have not previously been undertaken to examine this relationship in the Northern Territory, nor with a focus on the Indigenous population specifically.

This study matched daily admissions data for ischaemic heart disease (IHD) (ICD9 410-414, ICD10 I20-I25), the major cardiovascular disease diagnosis in this region, to regional climate percentile categories. Relationships between rates of IHD admissions and 95th percentile climate observations of Tmax °C, Tmin °C and wet bulb globe temperature (WBGT)°C were explored.

The figure to the far left shows where admissions data from 1992 to 2011 was accessed from five Northern Territory hospitals, located by red crosses on the map. The range of Australian temperature and humidity classification zones is also shown in this figure.

The figure to the left shows how admissions data were spatially categorised into thiesen regions, shown by red lines, which align to climate reference weather stations, shown by grey squares. Stars indicate where informed judgement allowed for realignment.

Results: IHD admission rates and climate sensitivity

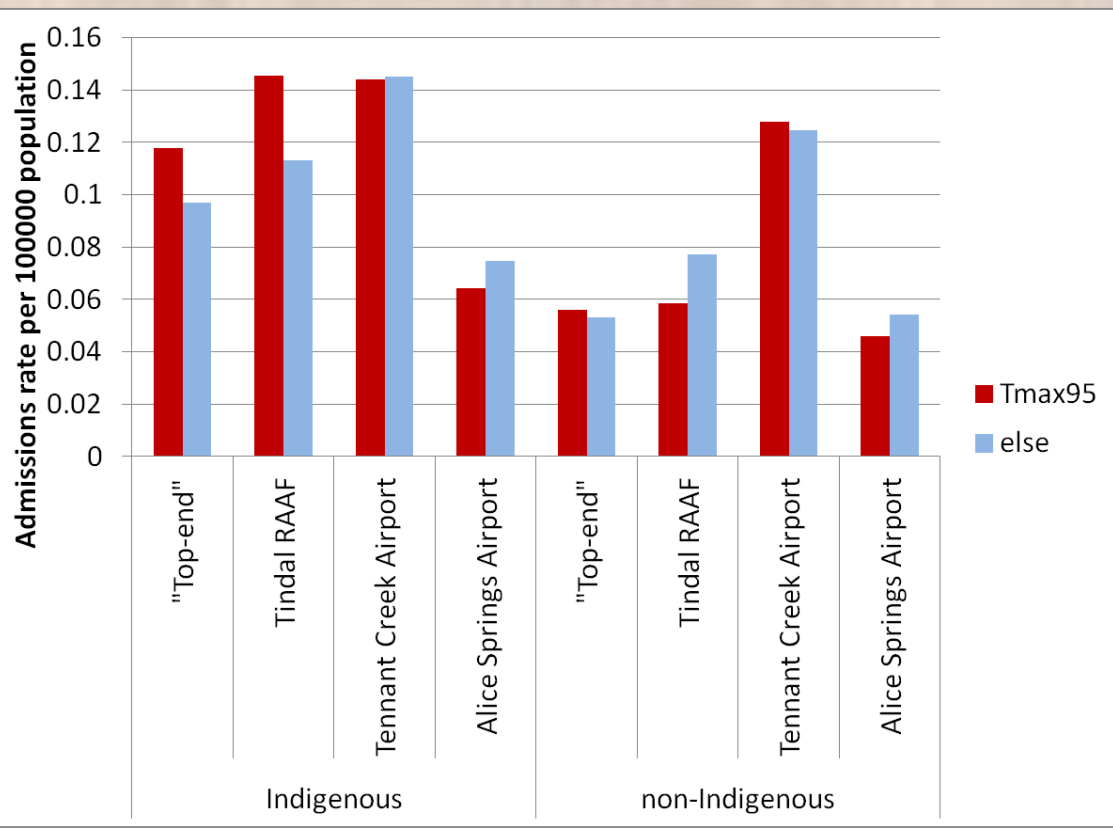


Unsurprisingly, we found there were higher overall IHD admission rates for the Indigenous population during 1992-2011.

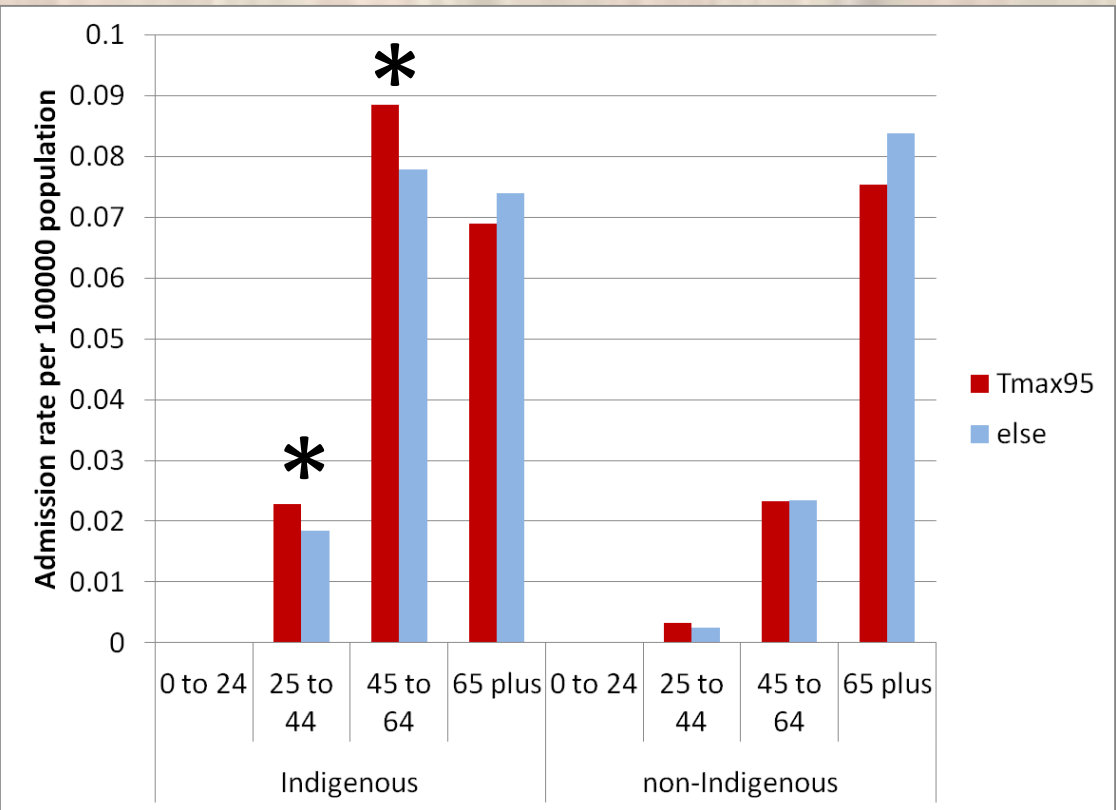
However, there was no effect for high Tmin, nor the high temperature/humidity combination index, as measured by WBGT, in either the Indigenous or non-Indigenous population on this admission rate.

We did find a higher IHD admissions rate with higher maximum temperatures, but it was only significant in the Indigenous population. Specifically, the observed admissions rate was increased by 14 per cent during the hottest five per cent of days for the Indigenous population (P=0.04¹).

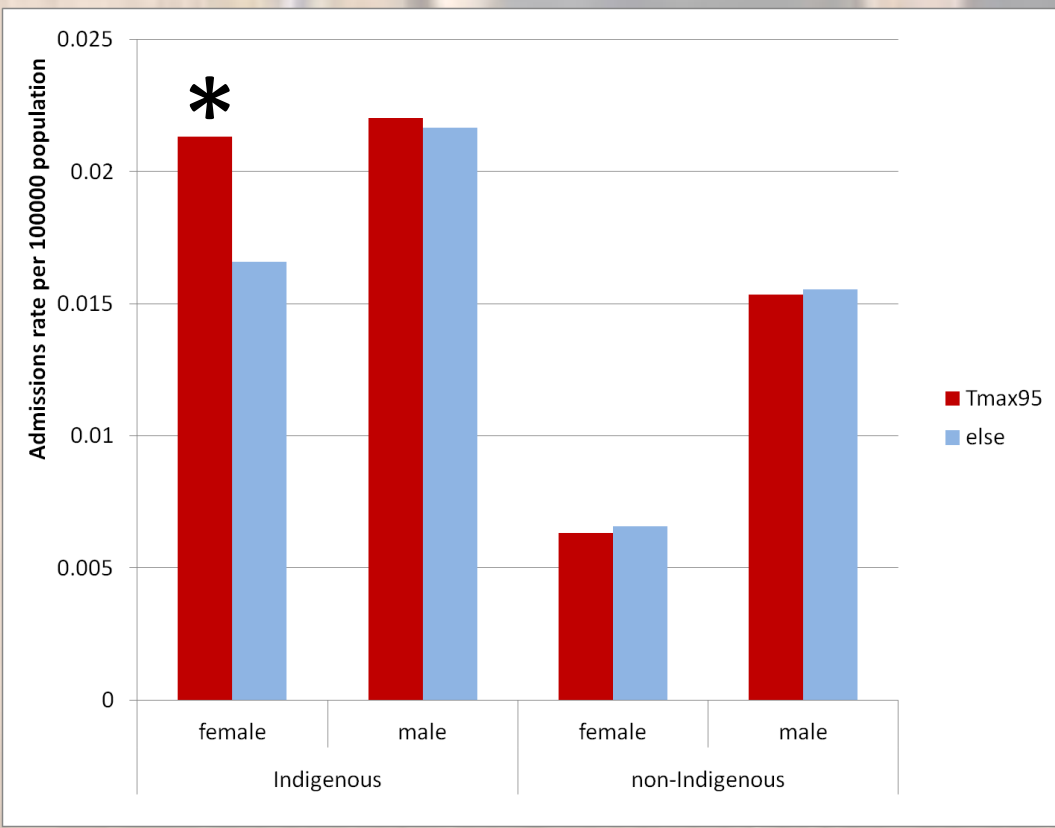
Variation by region, age and sex



For all but the Alice Springs Airport region there was an increase in IHD admissions rate observed on hotter days, though it was not significant: e.g. 'Top-end' (Darwin and Gove) 21 per cent (P=0.07¹) or Tindal RAAF 29 per cent (P=0.07¹).



For the Indigenous population there was a significant increase in the admission rate for the 24-44 year age group (P<0.05¹), and 45-64 years (P<0.01¹) which is related to hotter days (Tmax95).



Indigenous females had a greater response to temperature for IHD admissions than males (P<0.01¹) which is related to hotter days (Tmax95).

¹Statistics performed on daily admissions frequency
*Significant differences (P<0.05)

Summary

- ❖ Overall, there was a higher sensitivity to hotter conditions for ischaemic heart disease in the Indigenous population of the Northern Territory, where a 14 per cent increase in the rate of admissions occurred on the hotter days for the period 1992-2011.
- ❖ This relationship was strongest in the Indigenous 24-44 year age group with a 23 per cent increase, and for Indigenous females where a 29 per cent increase in admissions was detected.
- ❖ A regional variation in response was observed in these results, however not at a significant level.

We conclude from these findings that disproportionate impacts may result from projected climate changes on the health of the Indigenous population living in the Northern Territory without specific policy intervention.

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