

IS THE EFFECT OF MEAN TEMPERATURE ON EMERGENCY HOSPITAL ADMISSIONS FOR CARDIOVASCULAR DISEASES MODIFIED BY DIURNAL TEMPERATURE RANGE?

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Background and Aims: Both ambient mean temperature and diurnal temperature range are associated with human health. However, it is unknown whether the effect of mean temperature is influenced by diurnal temperature range. This study explored whether the relationship between mean temperature and emergency hospital admissions for cardiovascular diseases is modified by diurnal temperature range.

Methods: We estimated the effects of mean temperature and diurnal temperature range on the daily cardiovascular emergency hospital admissions during 1996–2005 in Brisbane, Australia. Poisson regression models accounting for overdispersion were used after adjusting for population size, long-term trend, holidays, day of the week, ozone, PM_{10} and humidity. Diurnal temperature range was divided into five groups for every 20 percentage of its distribution. We also evaluated the effects of two temperature exposures among several age groups (all age, 15–64, 65–74 and 75+).

Results: Diurnal temperature range was positively related to emergency hospital admissions for cardiovascular diseases in all age groups except for people aged 15–64 years old. When the diurnal temperature range was above 14.8 °C, the risk of cardiovascular diseases admissions increased by 11.5% ($p < 0.05$) compared to the baseline diurnal temperature range (< 8.6 °C) after controlling for mean temperature. Higher effect estimates were found for every unit degree (standard deviation of temperature) increase in mean temperature than that of diurnal temperature range. No modification effect of diurnal temperature range was found in the association between mean temperature and emergency hospital admissions for cardiovascular diseases.

Conclusion: Diurnal temperature range does not modify the effect of mean temperature on cardiovascular morbidity. Mean temperature contributes more in the temperature-morbidity relationship than diurnal temperature range. However, the elderly are more susceptible to diurnal temperature change than people aged between 15–64 years old.