Comparing the effect of different temperature indicators on mortality and hospital admissions in the Asian subtropical city of Hong Kong

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BACKGROUND AND AIM:Different temperature indicators may demonstrate different patterns of association with adverse health outcomes. It is important to identify suitable indicators for evidence-building and potential use in heat-health warning systems. The purpose of this study was to compare the associations of maximum, mean, and minimum temperatures on mortality and hospital admissions in the Asian subtropical city of Hong Kong.
METHOD:Meteorological, mortality, and hospital admissions data was obtained for Hong Kong, 2010-2019 hot seasons. Maximum, mean, and minimum temperatures were examined for their associations with mortality and hospital admissions using a combination of Generalized Additive Models (GAM) and Distributed Lag Non-linear Models (DLNM).
RESULTS:While maximum temperatures were not found significantly associated, mean and minimum temperatures were significantly associated with non-cancer mortality and hospital admission outcomes in Hong Kong. Particularly, minimum temperatures were more sensitive to the acute effects of hospital admissions. The associations were statistically significant mainly among older adults aged 65 and above, with only a slight variation when using higher age cut-offs.
CONCLUSIONS:Our study identified that mean and minimum temperatures were strong indicators in the highly dense subtropical city of Hong Kong. The study findings also suggest the potential protective effect of currently implemented hot weather warnings on maximum temperatures. This study was novel to comprehensively examine the effect of different temperature indicators on both mortality and hospital admissions in an Asian city, and simultaneously assess multiple age cut-offs and outcomes. With increased temperature variability due to climate change, the study findings can be used to support continued development of heat-health warning systems and other climate adaptation efforts.

Keywords: Temperature extremes and variability, Mortality, Epidemiology, Public health, Modeling

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