Is heat stress more indicative of summer mortality than temperature alone?

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Many minds, one mission

What metrics are most relevant to health?

There are a lot of heat stress metrics in the literature, each quantifying thermal (dis)comfort in a different way...

- Wet-bulb temperature (Tw) = temperature that an air parcel cools to through evaporation. Survivability threshold: 35 deg C

- Apparent temperature (AT) = 'feels like' temperature. Includes temperature, humidity and 10 m wind speed. Used by Australian Bureau of Meteorology

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What metrics are most relevant to health?

- Discomfort index (DI) = 0.5*Tdry-bulb+ 0.5*Tw. Used by Israeli Defense Force

- Not really heat stress metrics, but target temperatures of 'swamp coolers', representing the effect of evaporative cooling efficiencies e.g., 20% 40%, 60%, 80%.
    - A swamp cooler with 0% efficiency does not cool the room, resulting in dry-bulb temperature
    - A swamp cooler with 100% achieves maximum evaporative cooling, achieving wet-bulb temperature

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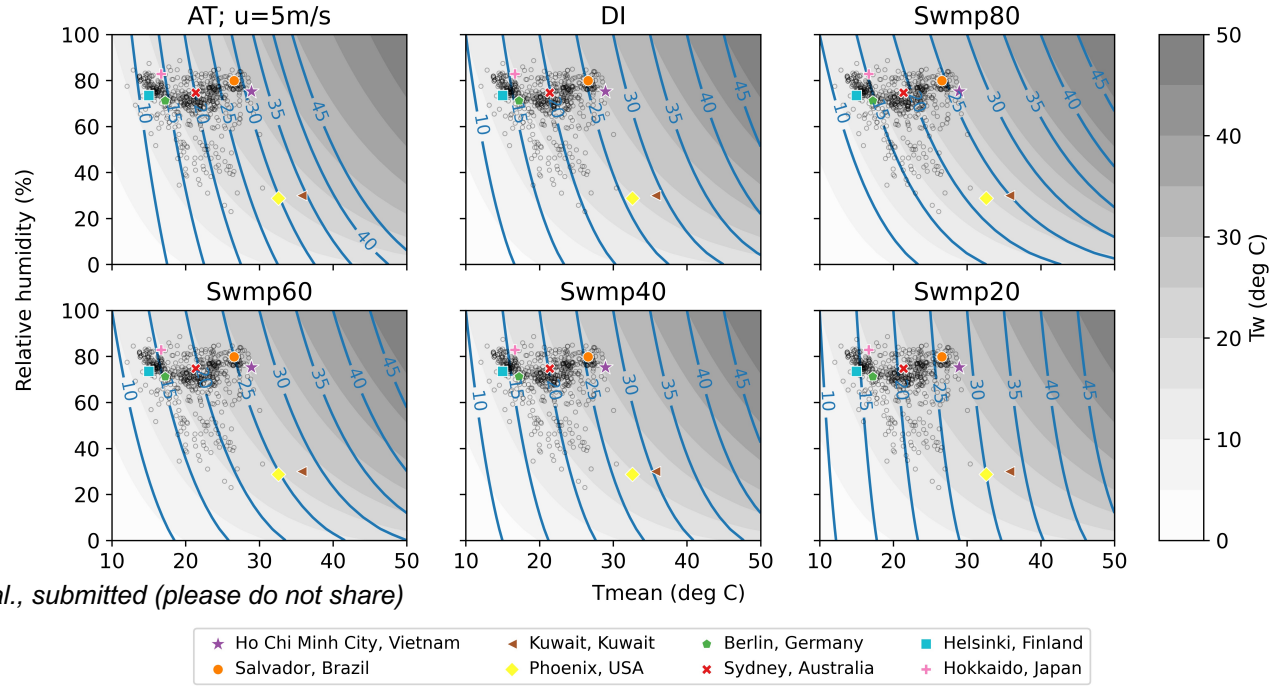
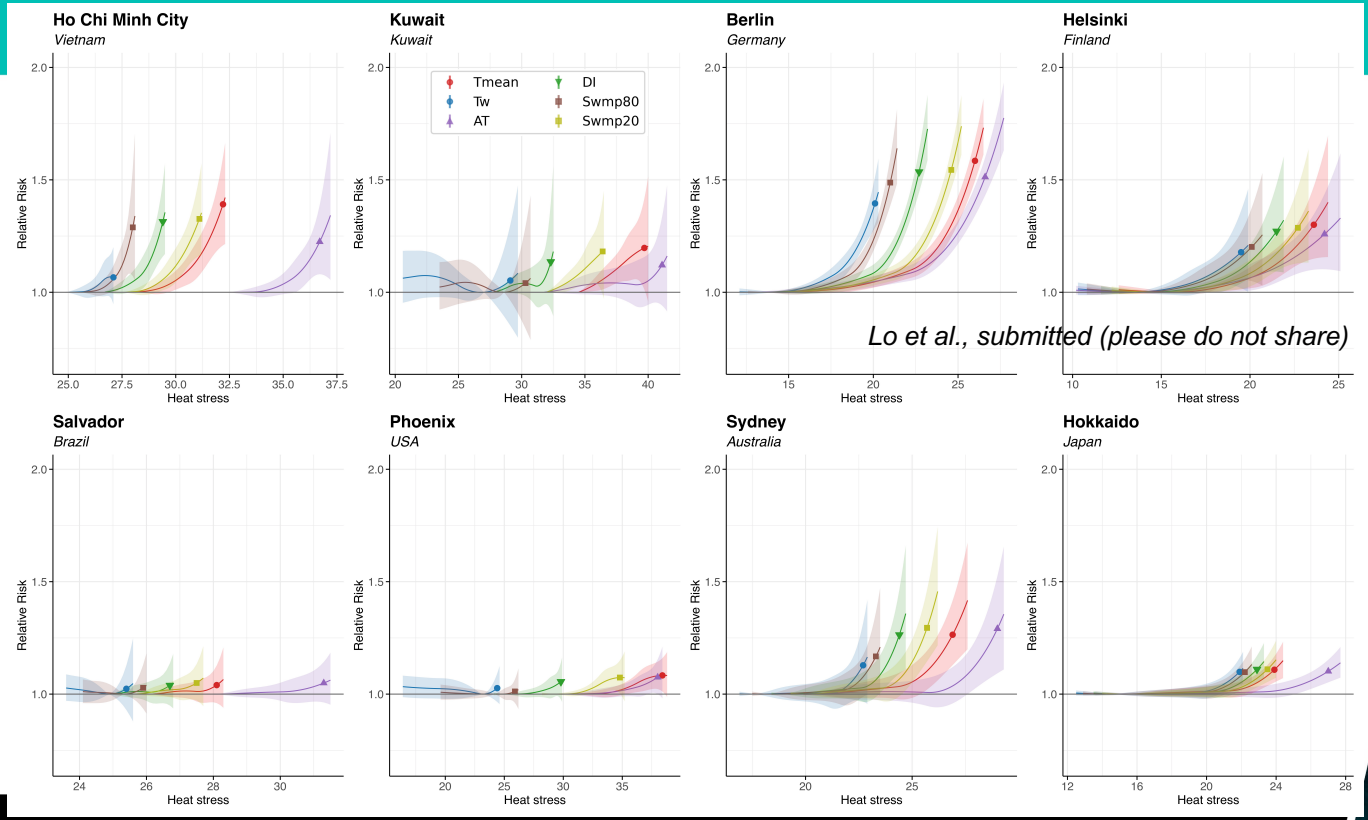
The temperature-humidity space



Lo et al., submitted (please do not share)

How they associate with warm-season mortality

human



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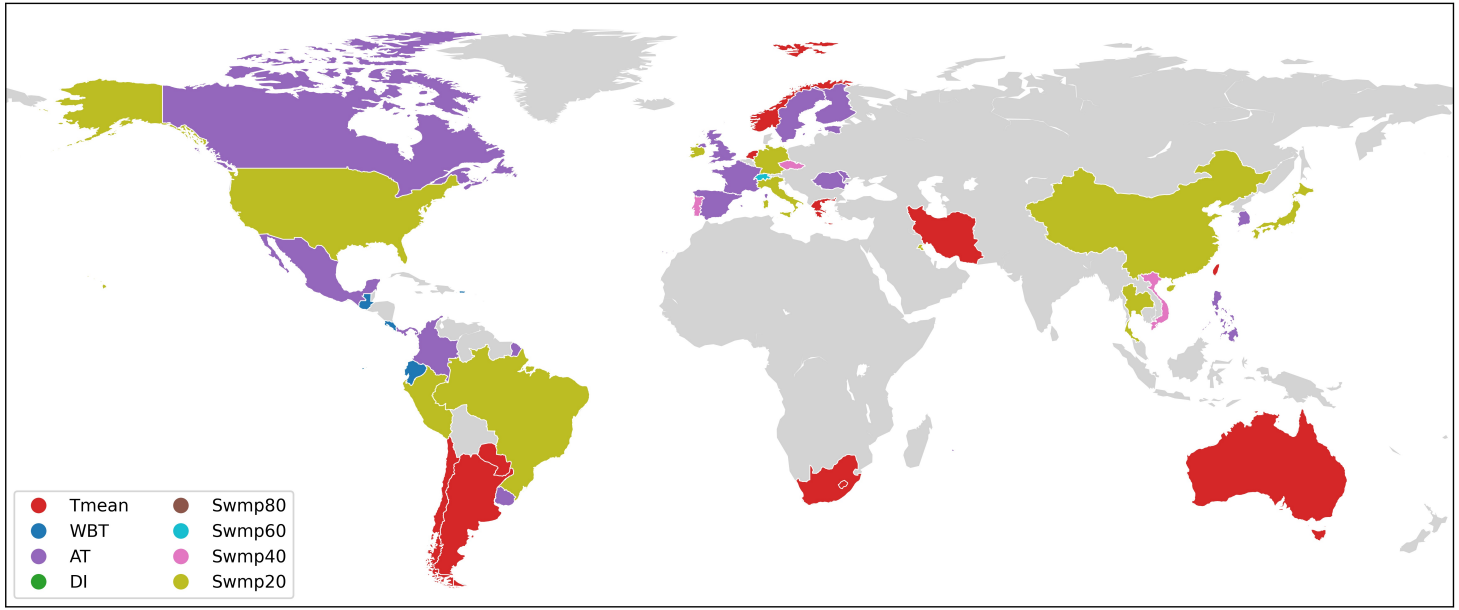
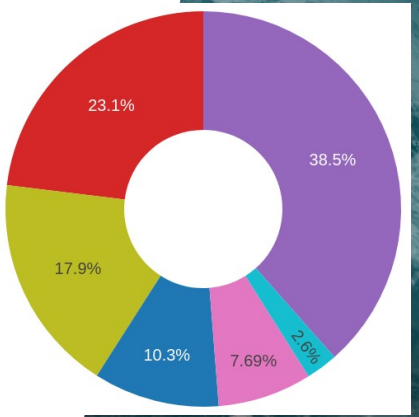
Which metric associates best by country





(Lo et al., submitted)

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Summary

The best metric for modelling warm-season mortality varies from country to country

Based on current available data, using dry-bulb temperature as the proxy for mortality results in similar mortality estimates

Thank you

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