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PRESENTATION TYPE: Oral

TITLE: Impact of anomalous temperature on injury mortality by age and sex in the USA

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ABSTRACT BODY:

Abstract: Background

Extreme temperatures which deviate from long-term averages will be more frequent as the global climate changes, and could have adverse health consequences. Much previous work has focussed on how mortality from natural causes is affected by daily or multi-day hot/cold episodes, and not on weather patterns that reflect inter-annual variations, as expected under global climate change, nor on injuries.

Methods

We formulated a Bayesian spatiotemporal model to estimate how deviations from long-term averages of mean monthly temperature as well as number of monthly extremes affect injury mortality in the contiguous USA. Our model incorporates how mortality varies by age, sex, state of residence, and month and year. Importantly, it associates monthly injury death rate to inter-annual variation of temperature from the average 30-year climate.

We calculated injury death rates for each age group, sex, state and year from national vital statistics over a 34-year period (1980 to 2013) and monthly population-weighted temperature statistics from the ERA-Interim project, which combines predictions of a physical model with ground-based and satellite measurements.

Results

Risk of dying from unintentional injuries increased in anomalously-warm June/July months in males, up to 1.8% (95% CI 1.2 – 2.5) per degree Celsius in July. Males ≤55 years were also at increased risk throughout spring and summer months, by up to 2.0% (1.0 – 3.2) in May. Only females 5-24 years were at increased risk in anomalously-warm months, and only in summer months. Intentional injuries showed no consistent relationship with anomalous temperatures. We will also show findings on transport accidents, accidental falls, accidental drowning, self-harm and assault.

Conclusion

More frequent or extreme anomalously-warm months will increase mortality for unintentional injuries in spring and summer months for males. There will be no change in mortality from intentional injuries.

KEYWORDS: Temperature, Exposure Models, Epidemiology, Meteorology, Statistical Methods.

Other Keyword: (none)

Award Consideration: Yes

Student or Early researcher: Student (incl. Masters, PhD)

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