EGU21-5127

CHARACTERIZING HYDRO-METEOROLOGICAL EXTREMES FROM A SOCIETAL PERSPECTIVE

HERE: HEAT WAVES

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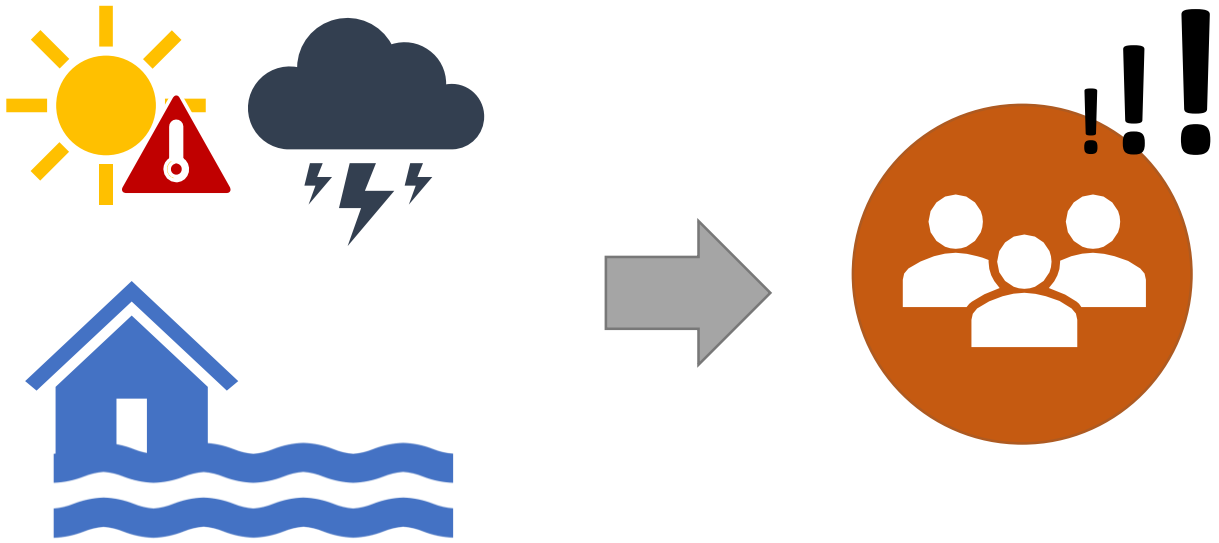
Session ITS3.2/BG7 – 'Climate extremes, biosphere and society: impacts, cascades, feedbacks, and resilience'

PICO: Wed, 28 Apr, 09:27–09:29 (CEST)
Breakout chat: 09:51–10:30 (CEST)

MOTIVATION

Climate change increases the frequency and intensity of hydro-meteorological extreme events



One indicator for the impact of extreme events on society is the concurrently increased societal attention

Research questions:

- How and when do extreme events trigger societal attention?
- Are there thresholds at which societal attention increases?

DATA

EGU21-5127: Bogdanovich et al.

Extreme event: heat wave

Climate contrasting countries:
Sweden, Germany, and Spain

Temperature variables:
- Min, max, mean daily temperature from ERA5
- Apparent temperature

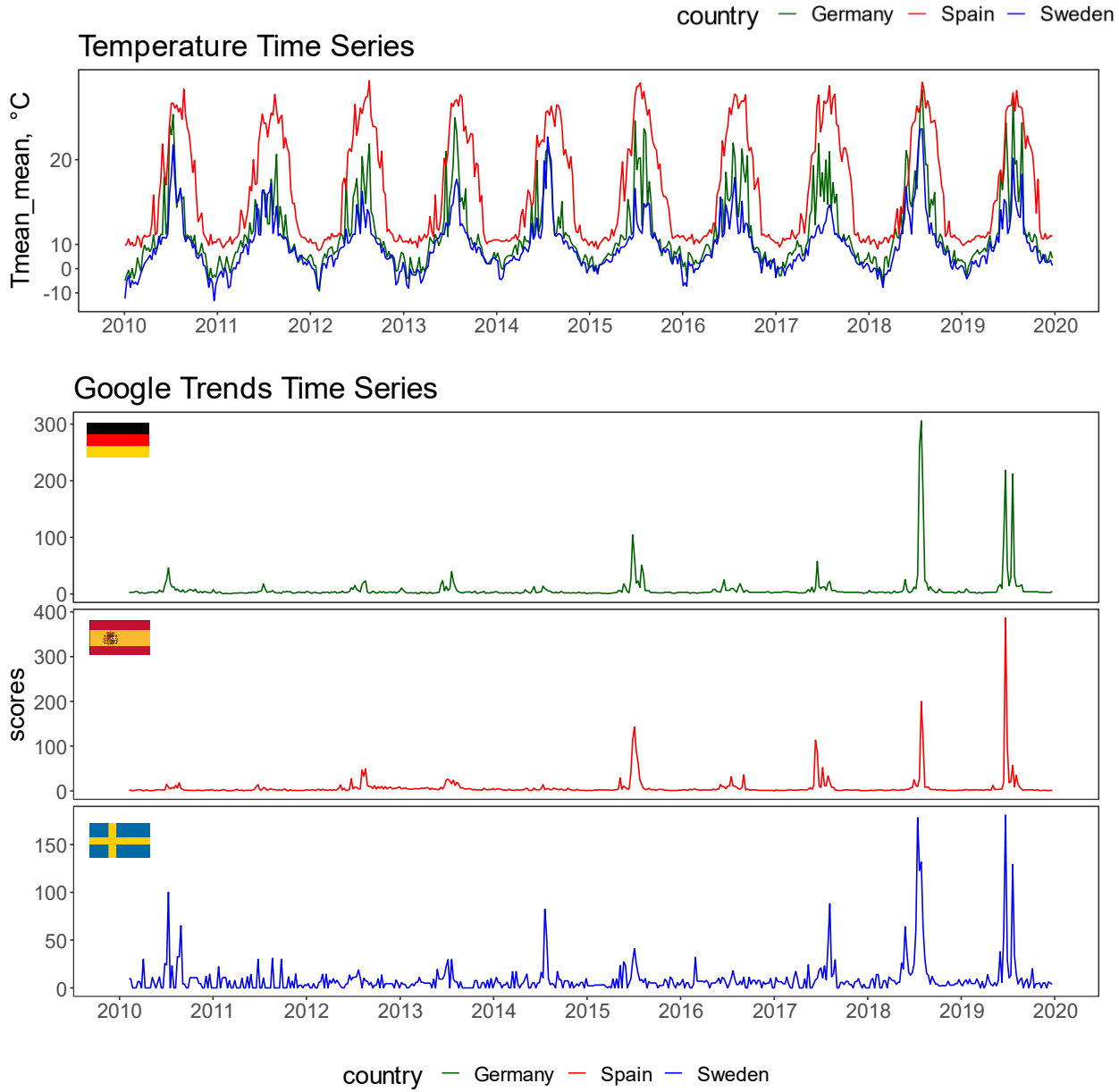
The variables are aggregated to weekly time scale

Attention:
- Google Trends

Search topic “heat wave” (considering also similar or related phrases)
weekly time scale

Societal variables for Germany:
- anomalies in mortality,
- number of heat-affected hospitalizations (hospital data),
- number of newspaper article titles with heat wave mentions (press),
- number of article titles from news web portals (press online)

weekly time scale



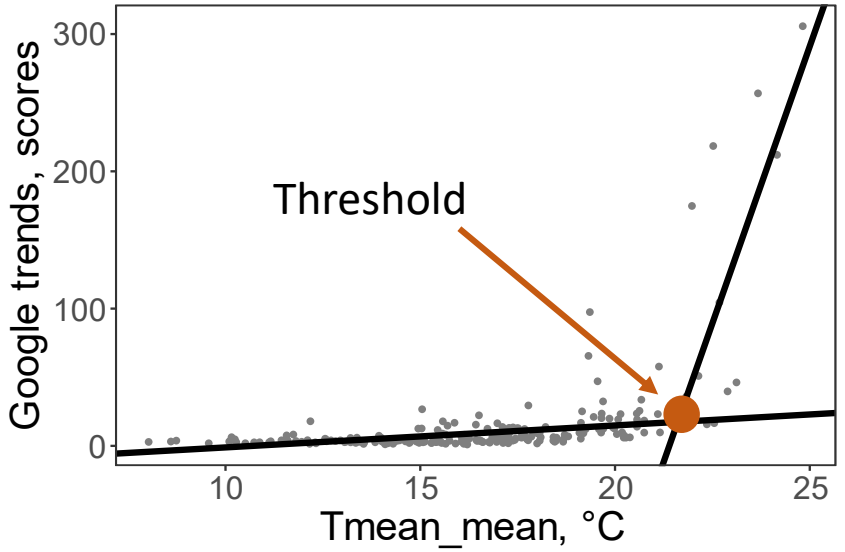
METHODS

To determine the most relevant temperature variable:
- Random Forest

To identify the threshold:
- Piecewise regression

The threshold is determined as the breaking point between two linear models fitted to data

To infer threshold uncertainties:
- Bootstrapping



RESULTS

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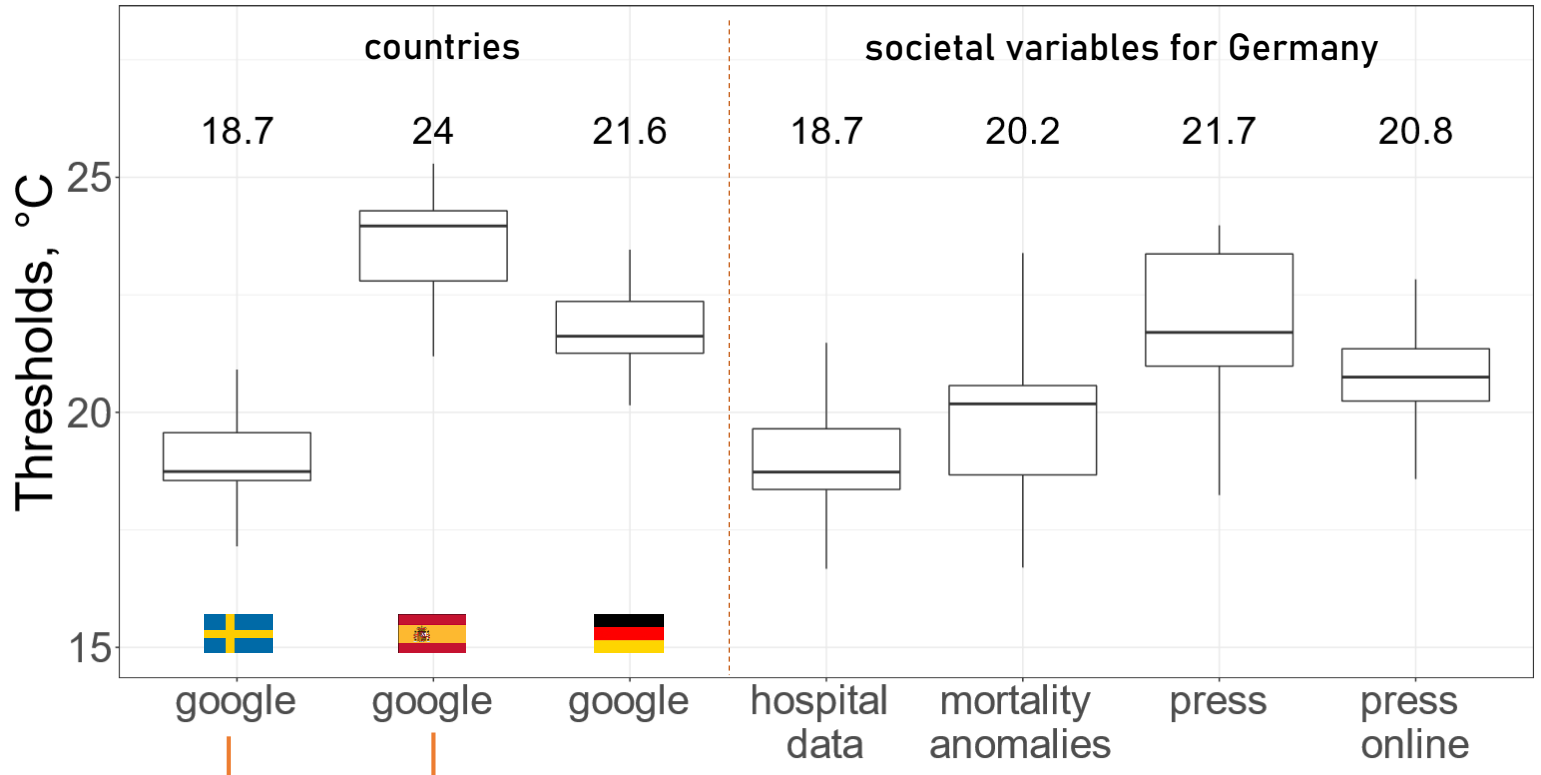
Temperature-related thresholds in attention (medians are annotated)



As revealed by random forest analysis, weekly average of daily average temperature has the highest explanatory power for attention

Sweden:
lower threshold indicates higher heat vulnerability

Spain:
higher threshold indicates lower heat vulnerability

Germany:
In general we found similar threshold for other societal variables. Lower thresholds for hospitalizations and mortality, probably induced by more elderly affected people not sufficiently sampled by google trends data

OUTLOOK

The identified temperature variable and thresholds offer the opportunity to define heat waves from societal-impact perspective