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# Towards a pan-European forecasting system for heatwave-related health hazards (Tromp Foundation Travel Award)

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In recent years severe and prolonged episodes of summer heat such as the 2003 European heatwave proved that extreme high temperatures are responsible for excessed mortality in affected areas, and Heat Health Warning Systems (HHWSs) need to be put in place to mitigate the negative impacts caused by hot weather extremes on human health.

A heatwave-associated HHWS is being developed as part of the pan-European multi-hazard early warning system constructed within the HORIZON2020 ANYWHERE project (EnhANcing emergencY management and response to extreme WeatHER and climate Events). The ANYWHERE HHWS is based on the forecast of the Universal Thermal Climate Index (UTCI), a state-of-the-art biometeorological index representing the heat stress induced by the atmospheric environment on the human body [1]. As UTCI forecasts have been recently proved skilful in predicting hazardous heat stress levels at the medium range (i.e. up to 10 days) [2], the ANYWHERE HHWS is based on the UTCI forecasts computed daily at the European continental scale using air temperature, humidity, wind and radiation from ECMWF high-resolution and ensemble prediction models.

In order to explore the significance of the ANYWHERE HHSW from a health perspective, the potential of UTCI as a predicting tool for heat-related health hazards has been assessed [3] and here it will be presented. Bioclimatological conditions of heat stress across Europe will be described via UTCI maps calculated from 38 years of ERA-Interim reanalysis data used as proxy for observation. The association between the UTCI and summer mortality data from 17 European countries will be discussed, and the UTCI's ability to represent mortality patterns demonstrated for the 2003 European heatwave.

[1] Błażejczyk K. et al. (2013). An introduction to the Universal Thermal Climate Index. Geographia Polonica, 86(1): 5-10
[2] Pappenberger F. et al. (2015). Global forecasting of thermal health hazards: the skill of probabilistic predictions of the Universal Thermal Climate Index (UTCI). International Journal of Biometeorology 59(3): 311-323
[3] Di Napoli C. et al. (2018). Assessing heat-related health risk in Europe via the Universal Thermal Climate Index (UTCI). International Journal of Biometeorology, https://doi.org/10.1007/s00484-018-1518-2