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Forecasting extreme temperature health hazards in Europe

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Extreme hot temperatures, such as those experienced during a heat wave, represent a dangerous meteorological hazard to human health. Heat disorders such as sunstroke are harmful to people of all ages and responsible for excess mortality in the affected areas. In 2003 more than 50,000 people died in western and southern Europe because of a severe and sustained episode of summer heat [1]. Furthermore, according to the Intergovernmental Panel on Climate Change heat waves are expected to get more frequent in the future thus posing an increasing threat to human lives. Developing appropriate tools for extreme hot temperatures prediction is therefore mandatory to increase public preparedness and mitigate heat-induced impacts.

A recent study has shown that forecasts of the Universal Thermal Climate Index (UTCI) provide a valid overview of extreme temperature health hazards on a global scale [2]. UTCI is a parameter related to the temperature of the human body and its regulatory responses to the surrounding atmospheric environment. UTCI is calculated using an advanced thermo-physiological model that includes the human heat budget, physiology and clothing. To forecast UTCI the model uses meteorological inputs, such as 2m air temperature, 2m water vapour pressure and wind velocity at body height derived from 10m wind speed, from NWP models.

Here we examine the potential of UTCI as an extreme hot temperature prediction tool for the European area. UTCI forecasts calculated using above-mentioned parameters from ECMWF models are presented. The skill in predicting UTCI for medium lead times is also analysed and discussed for implementation to international health-hazard warning systems.

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