**Exposure paper plan**

**Part 1**

* Use climate models to obtain future statistics for EHEs based on HHAP definitions
* Use future populations projections for locations with HHAPs, and some without also
* Calculate exposure in terms of person-days
* Highlight vulnerable groups, e.g. young and old if possible with population projections

**Part 2**

* Compare HHAPs with alternative methods in other papers/HHAPs
* Quantitative measure of cost from

**Abstract**

Extreme Heat Events (EHEs) can cause a significant increase in morbidity and mortality in vulnerable populations.1,2 In response, many local and national administrations have developed their own Heat Health Warning Systems (HHWSs), triggering complementary Heat Health Action Plans (HHAPs), designed to minimise extreme heat exposure of the most vulnerable.3,4

EHEs, although measured with several different metrics and thresholds, are expected to increase in frequency and duration under all viable future climate change scenarios.5 This casts a special focus on how the HHAPs are designed and equipped to handle EHEs in the next century.

It is thus incumbent on for those in the extreme heat research community to scrutinise these tolerance level of HHWSs, and to understand how prepared we are for future EHEs. Based on the stocktaking of HHWSs and HHAPs, we will ‘stress-test’ a selection of plans. By using a combination of future global climate projections, projected spatial distribution of future population changes, and thresholds explicit in HHWSs, we will assess the change in exposure of populations over a HHWS threshold in terms of person-days.

In this way, we quantify how many warnings current HHWSs would issue in the future, and how often current HHAPs will need to active their plans. This method could provide a good quantitative estimate of the financial resources necessary to carry out HHAPs. This study could also help establish whether respective HHWSs and HHAPs are optimally-designed to tackle the challenges of climate change in the years ahead.

Other studies have also developed worldwide projections for numbers of extreme heat days defined by a comfort index relative to the current baseline.6,7 Using the results from these studies, it will also be possible to compare the discrepancy of number of trigger days in HHWSs using an administration’s own system.

We will scrutinize whether HHWSs are triggering the same days when compared to other studies, for both the present and under future climate change conditions. In this way, we will be able to provide a quantitative assessment of the suitability of a HHWS against architectures of other plans, and if they are underperforming, by how much both in the present and going into the future.

**References**

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