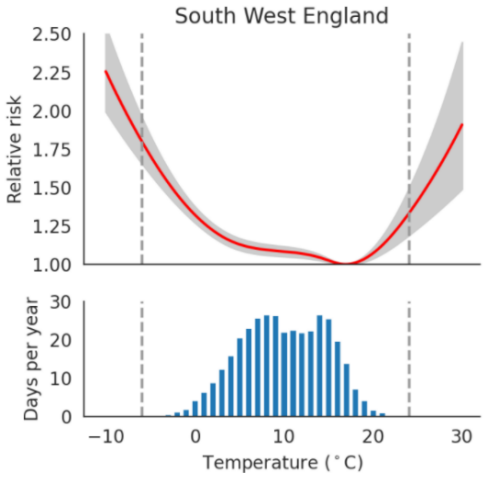
Developing climate services for the health sector

Why this is important: Weather and climate can have great impacts on human health. One aspect is temperature exposure with health consequences being increased risks of heart attacks, strokes, and respiratory diseases. In the UK, around 9% of deaths are associated with too warm or too cold outdoor temperatures, the majority currently relating to cold weather. However, as the climate warms, an estimated 7000 additional deaths per year by the 2050s associated with heat exposure are predicted if the population does not sufficiently adapt. An aging population compounds the problem, as the elderly are particularly at risk due to their increased vulnerability. With these increasing health risks there is a growing incentive to develop a UK climate service for health.

What the UKCR programme is doing: The project has four key aims, namely (1) to use the link between temperature and mortality to develop an understanding of the underlying atmospheric dynamics that led to extreme health impacts in the UK (2) to estimate future health-climate risks through the application of UKCP18 (3) to consider the impact on the urban scale using an Urban Land Surface Model and (4) to incorporate vulnerability and exposure information in order to create a risk atlas. The project has been following a co-development approach, with stakeholder engagement running in parallel with the scientific and technical work. In order to ensure that the project delivers what users require, we have been actively engaging with Public Health England, NHS England and Scotland, Wales and Northern Ireland. Engagement has been challenging due to COVID-19 but there is clear interest in the work with a number of potential pathways for application covering short-term weather forecasts, seasonal timeframes as well as climate timeframes.

Results so far: The relationship between weather regimes and mortality in the UK has been investigated using a statistical model to establish the temperature-mortality relationship for 12 UK regions. This has allowed the identification of weather regimes that lead to high mortality in the UK. High mortality due to summer heatwaves is most likely to occur when there is a high-pressure system over the North Sea and Scandinavia which leads to clear sunny days in the UK. In winter, high mortality days associated with cold spells most often occur when the pressure over Greenland is higher than usual, leading to air masses arriving in the UK mostly coming from cold, continental regions in the east and north-east. Significant cold-related mortality can also be found in summer in the UK, on days with average temperatures of around 10°C. However, these are expected to be of lesser importance in the future as the climate warms.



Temperature and emergency hospital admissions across London boroughs have been analysed to examine temperature-related admissions on the urban scale. Boroughs that are warmer in winter (mostly in Inner London) tend to have lower hospital admissions throughout

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the year. However, the relation is not observed in summer (East London also tends to be slightly warmer than others in summer, but without a corresponding pattern in admissions). This points to the importance of socio-economic, demographic, or other environmental factors which have been found to contribute more to heterogeneity in temperature-related hospital admissions across London than differences in outdoor temperature.

What is next? Current efforts are focused on identifying measures for vulnerability to temperature extremes in the population. The aim is to tie together ambient temperature hazards and population vulnerability in order to produce a risk atlas that can be used directly to inform the health sector.

References:

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