Session1- ‘Climate Change Statistics and Indicators’

Global Climate Change and its Impact on Health

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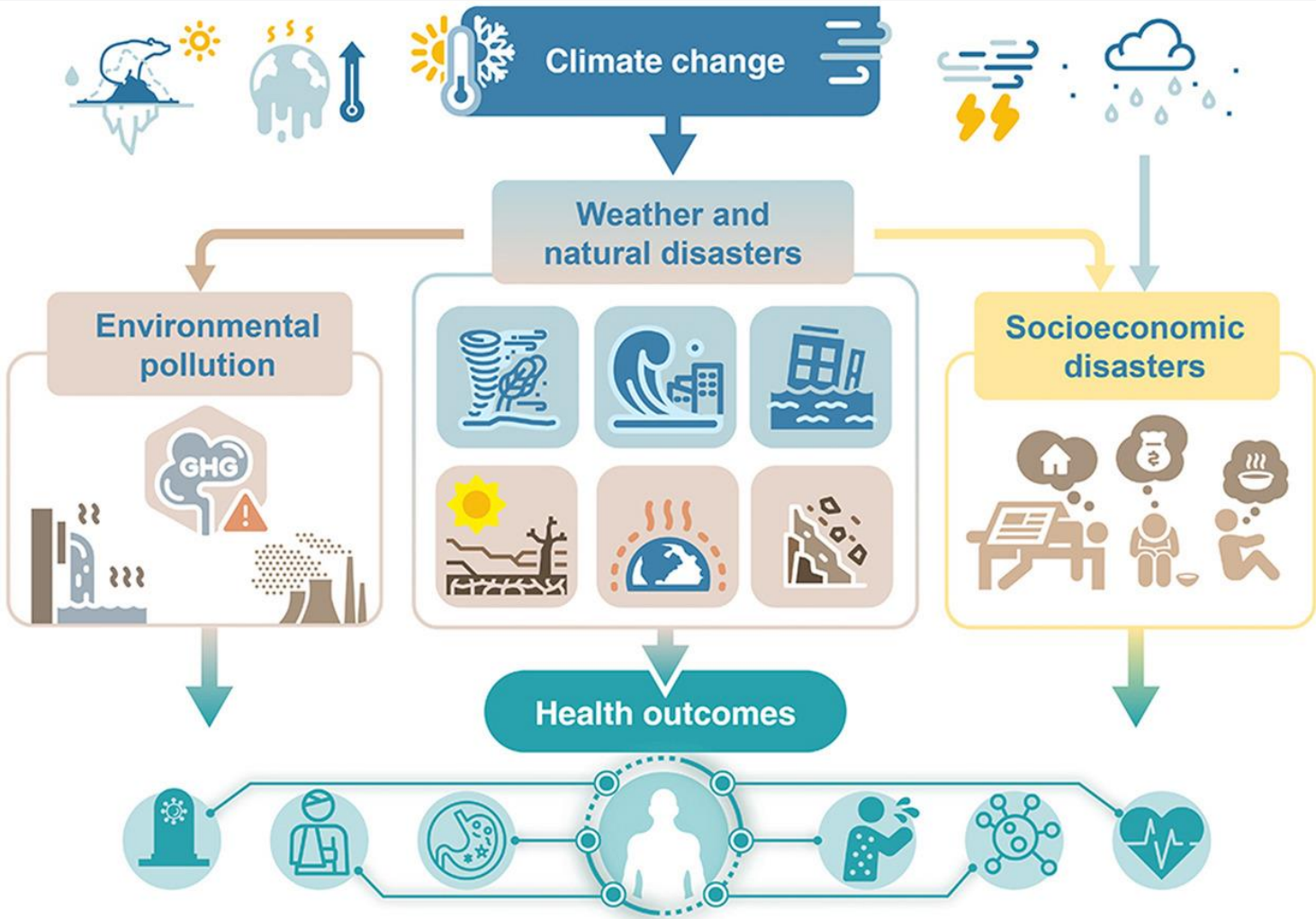
Outline

- Global overview on climate and health
- Climate and health- pathways
- Climate and health- indicators
- Heat and health- examples (ONS recent publication)
- Conclusion
- Group work session

Climate Change and Health Interaction

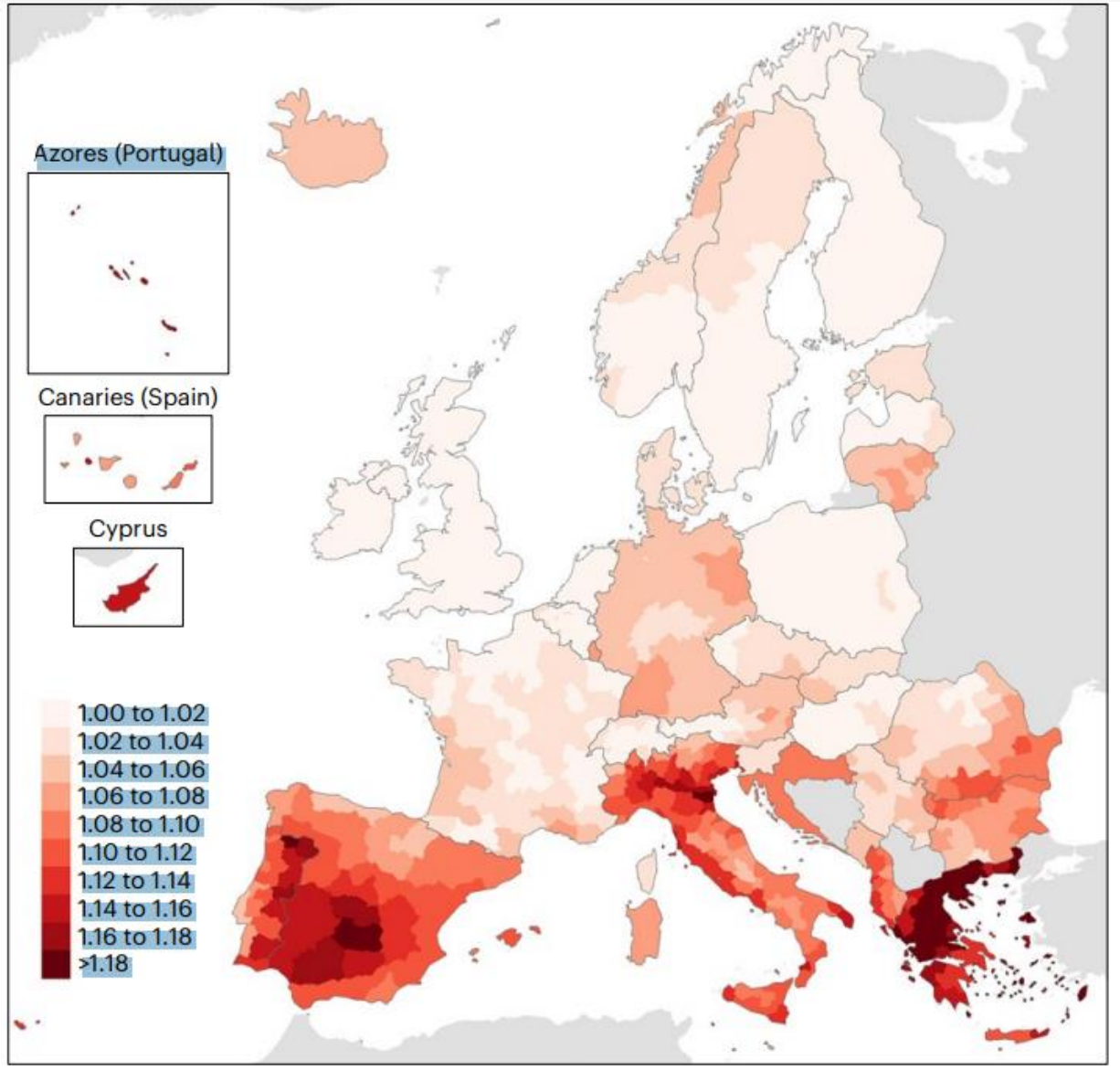
- Climate change has been regarded as the single largest global health challenge in the 21st century.
- Climate change affect health both directly and indirectly, through undermining the natural disasters and socioeconomic pathways.
- Intergovernmental Panel on Climate Change (IPCC) AR6th report estimated that up to 3.6 billion people are living in conditions that are highly vulnerable to the impacts of climate change.



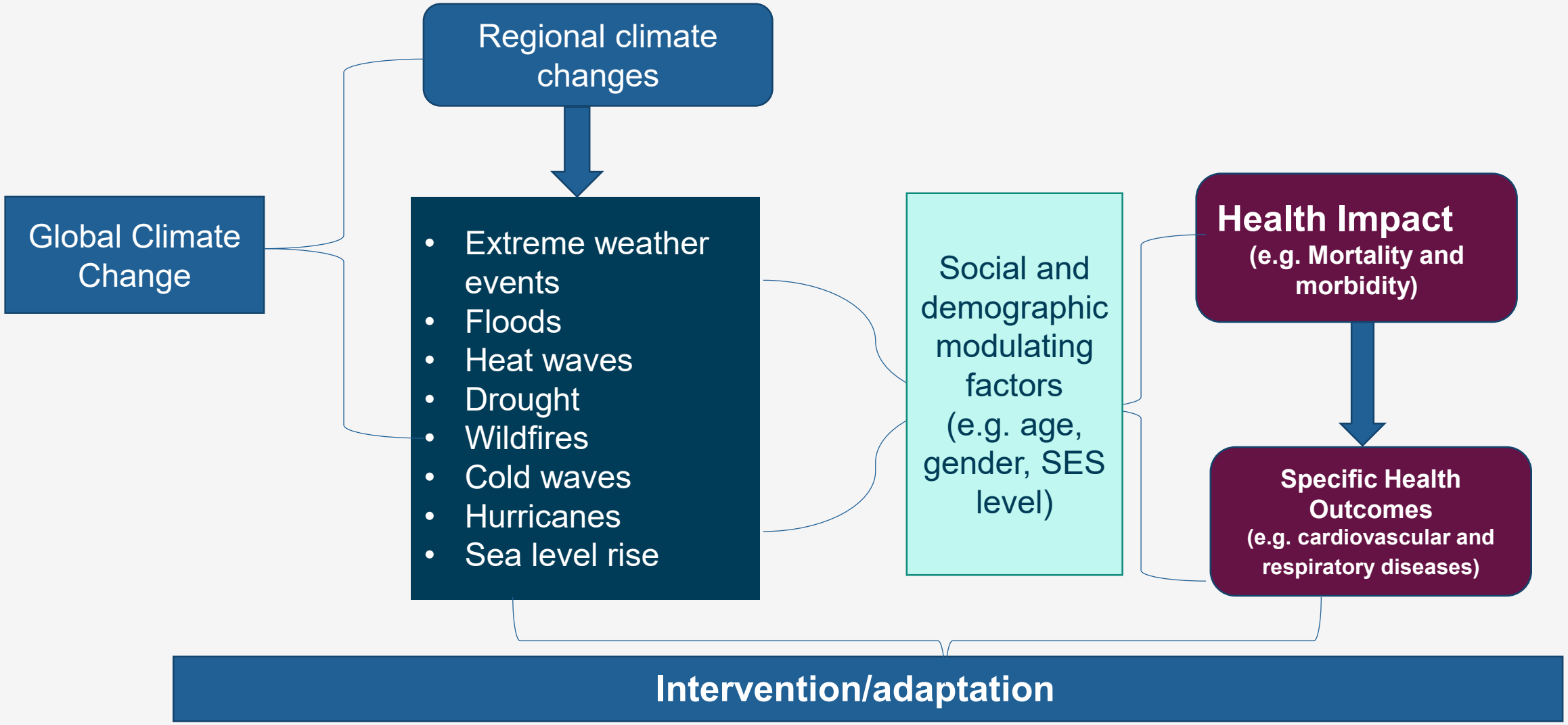
Reference: Qi Zhao, Pei Yu, Rahini Mahendran, Wenzhong Huang, Yuan Gao, Zhengyu Yang, Tingting Ye, Bo Wen, Yao Wu, Shanshan Li, Yuming Guo, Global climate change and human health: Pathways and possible solutions Eco-Environment & Health 2022

Health Impact of Climate change

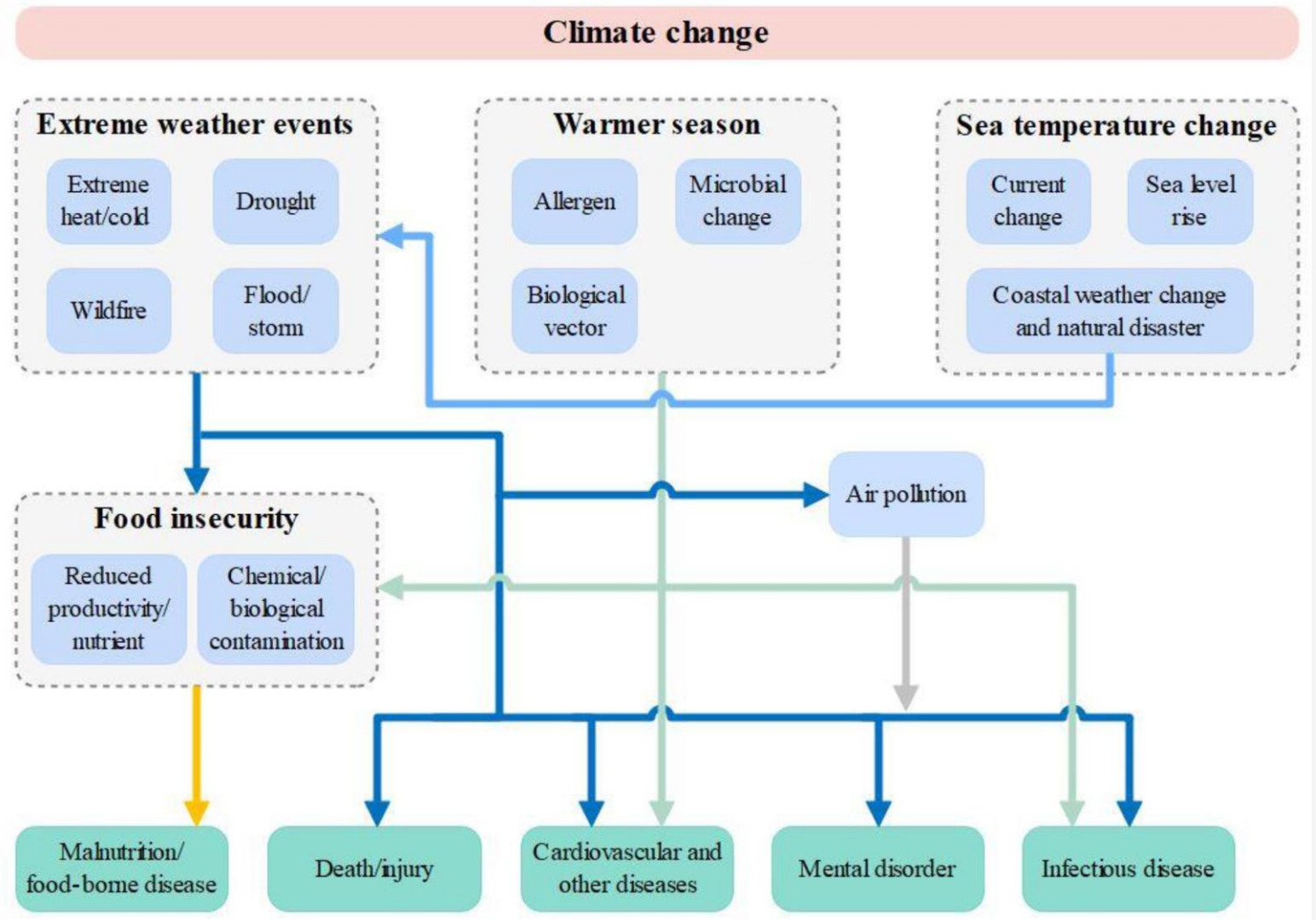
- Recent estimate accounted 61,672 heat-related deaths in Europe between 30 May and 4 September 2022.
- Italy, Spain, Germany, France, the United Kingdom and Greece had the highest summer heat-related mortality numbers.
- WHO projected between 2030 and 2050, climate change is expected to cause approximately 250 000 additional deaths per year, from malnutrition, malaria, diarrhoea and heat stress.
- Providing a single estimate of the overall health burden of climate change is challenging.



Climate and Health Pathways



Climate and health- Indicators



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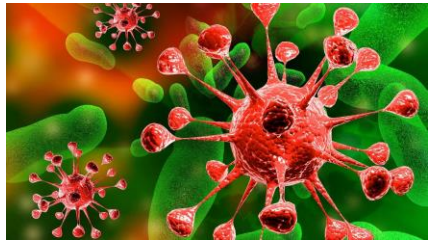
Climate and health- Indicators

Extreme weather Events

1. Injury and mortality from extreme weather events (flooding and wildfire).
2. Heat- and cold-related mortality and morbidity
3. Air pollution and health

Warmer Season

1. Vector-borne diseases (incl. zoonoses)
2. Effects on health systems and facilities =
3. Respiratory illnesses (incl. zoonoses)
4. Mental and psychosocial health



Food insecurity

1. Exposure to chemical contaminants
2. Effects on health systems and facilities
3. Malnutrition and food-borne diseases
4. Water-borne diseases and other water-related health impacts

Heat and Health- how to report mortality and health outcome?

Time Series Analysis

Bhaskaran et al

Remove effects of longer term and periodic factors affecting mortality
Determine appropriate adjustments for confounding factors primarily using Met Office data

Long Term Trend & Seasonality
Removing periodic mortality effects and longer term trends

Temperature Lag Terms
Allowing for delayed effects of hot & cold

Additional Confounders: Pollution, Humidity
Adjusting for additional factors related to temperature and mortality (potentially lagged)

Regression Modelling

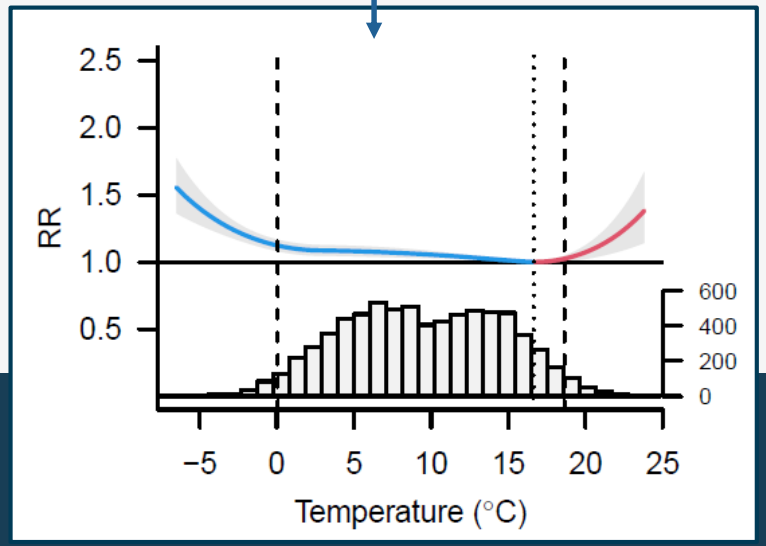
Gasparrini et al

Relative Risk of temperature exposure adjusting for confounders
Meta analysis to allow regions with smaller sample size to borrow power from other regions, adjustment for location specific factors, understanding regional heterogeneity

DLNM Poisson Time Series Regression Model
Regional Relative Risk estimates adjusting for confounding & allowing for delayed temperature effects

Results

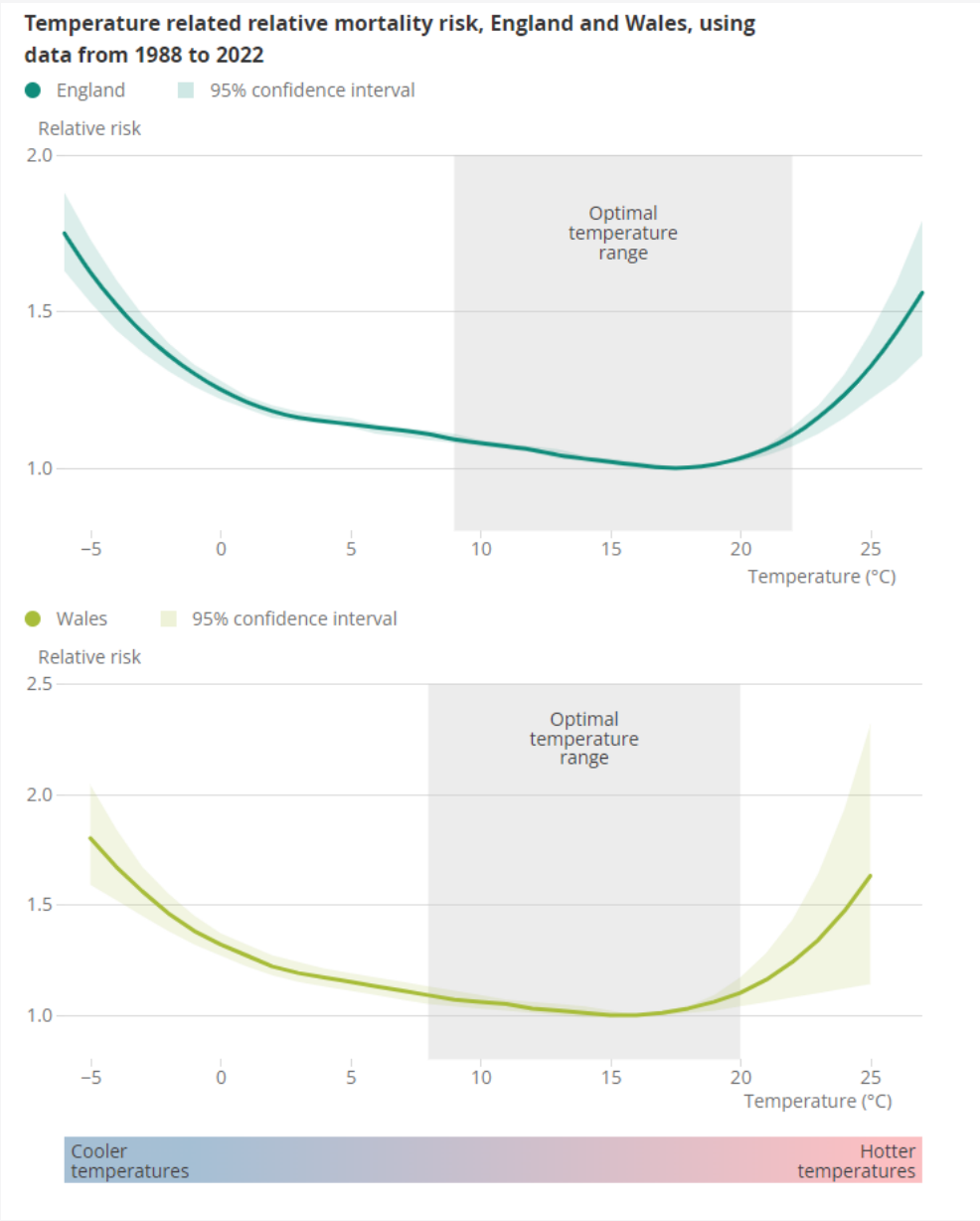
Mortality temperature distribution
Relative Risk estimates x 9 English regions, Wales
Region specific factors / differences
Sensitivity analysis – testing model assumptions
Benchmarking to Gasparrini results



The regional breakdown of deaths associated with the coldest and hottest days over the most recent five-year period from 2018 to 2022

Table 1: Deaths related to the hottest and coldest days across English regions, 2018 to 2022

English Region	Estimated cold-related deaths	Cold Related Deaths per 100,000	Estimated heat-related deaths	Heat Related Deaths per 100,000
East of England	2,900	9	1,600	5
East Midlands	1,800	7	900	4
London	3,000	7	2,200	5
North East	1,200	9	700	5
North West	3,200	9	800	2
South East	3,800	8	1,900	4
South West	2,800	10	1,100	4
West Midlands	2,400	8	1,200	4
Yorkshire & the Humber	1,800	7	900	3



Source: https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/articles/climaterelatedmortalityandhospitaladmissionsenglandandwales/1988to2022

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Conclusion

- Climate change and air pollution are two main challenges in the society today.
- Climate and health relationship are complex and single estimates of climate impact on health is difficult.
- Certain socioeconomic, demographic and environmental factors may modify the pathways between climate change and health.
- Climate adaptation and mitigation action are needed.
- Reporting regular official statistics may be helpful for policy makers in order make climate and health intervention plans.
- How can we think and process for the development of framework for climate health official reporting?- Next **Group activity!**

Thanks to the team, partners and funders

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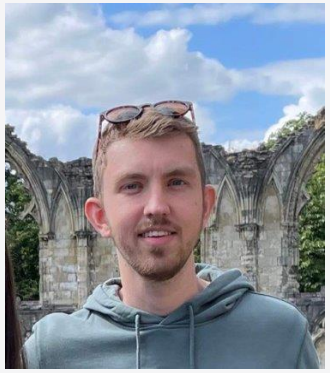



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