

Early Adaptation Response to Climate Change: *Human Health*

Joan Ballester

Climate and Health Program (CLIMA)
Barcelona Institute for Global Health (ISGlobal)

joanballester.eu + heathealth.eu + early-adapt.eu



European Research Council

Established by the European Commission

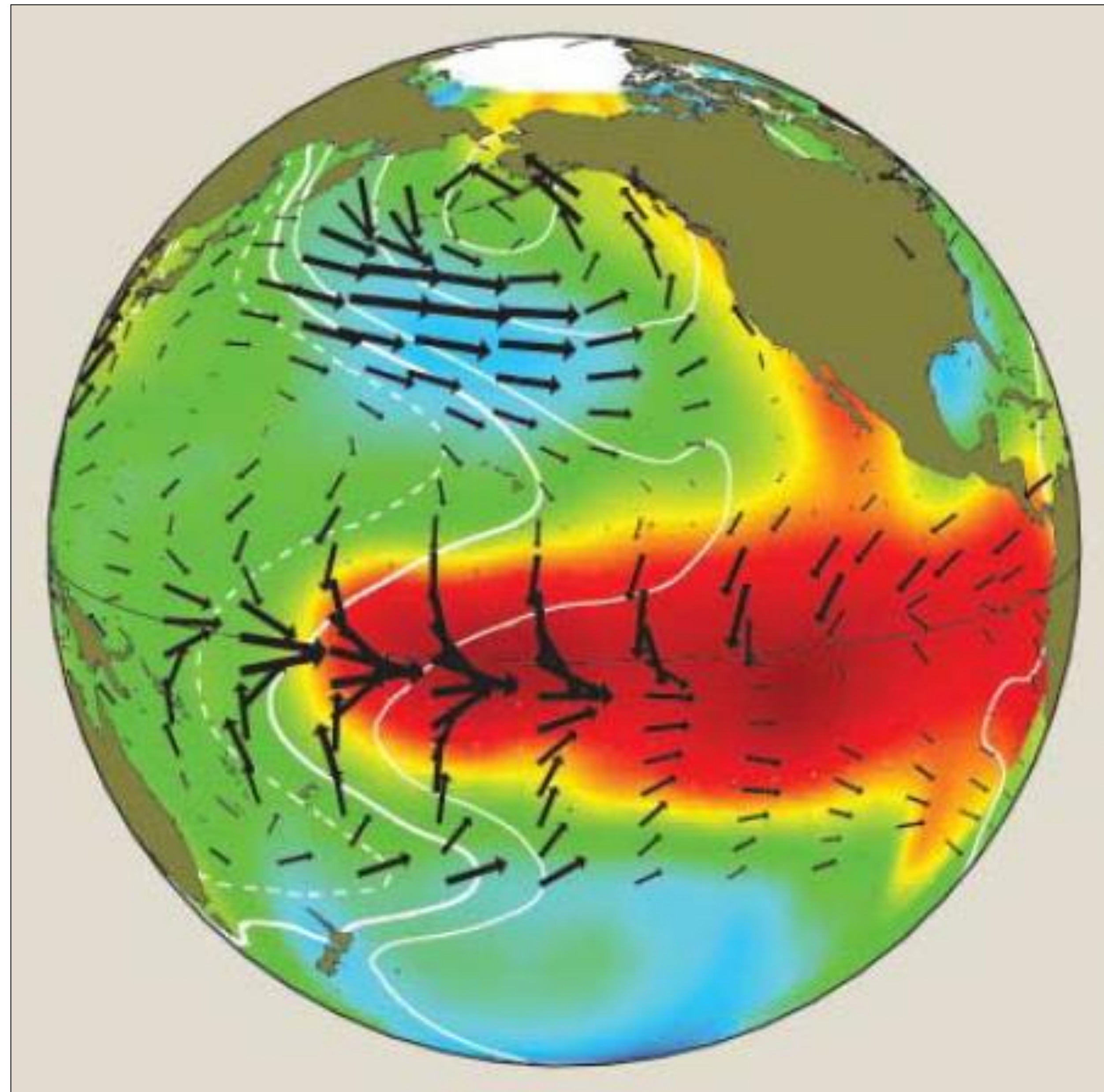
ISGlobal **Barcelona**
Institute for
Global Health

Climate Change and Population Dynamics
Webinar organized by IUSSP, PERN and EAPS
September 16th 2021



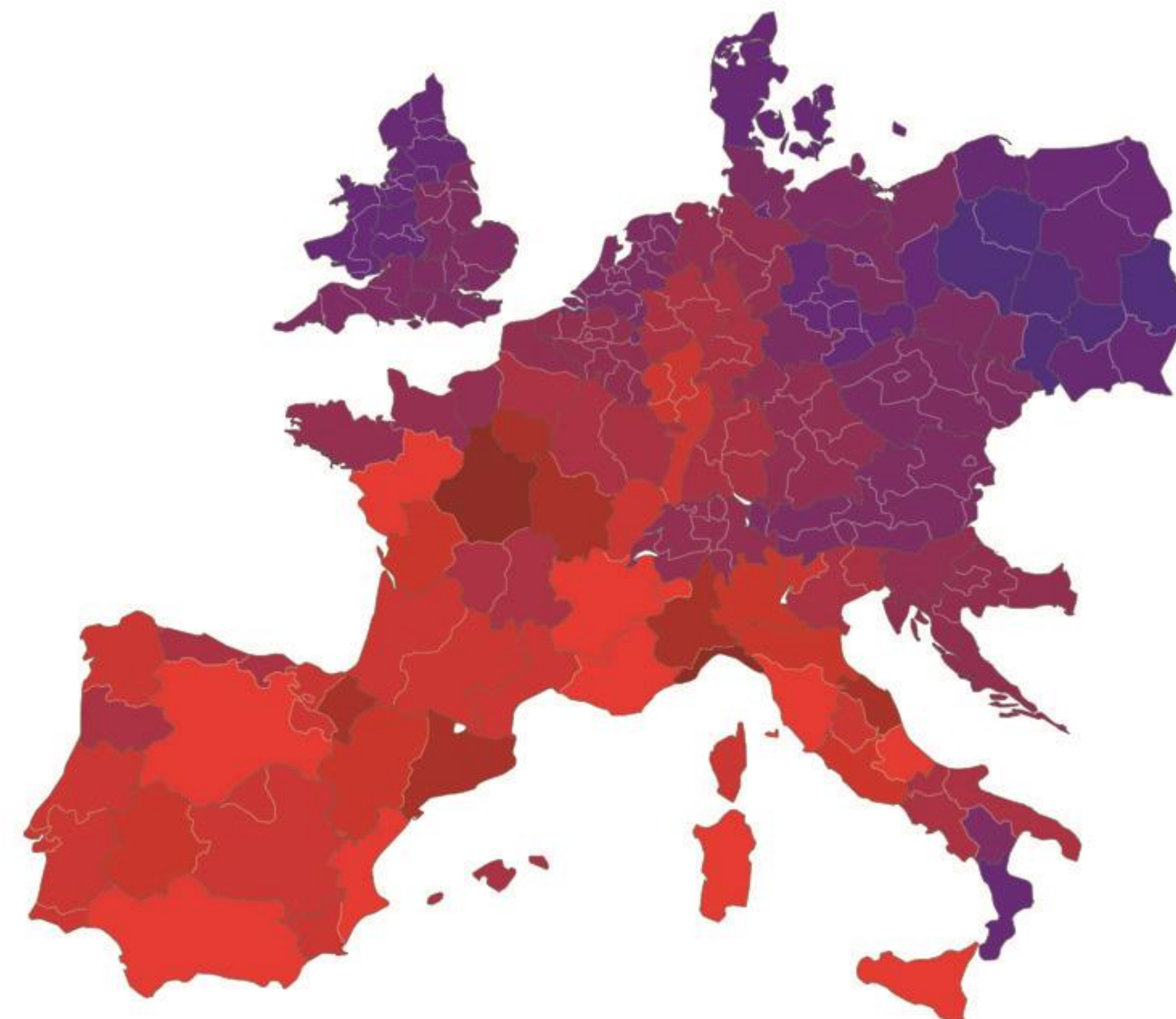
Climate Models: from Global to Local

Earth System Models



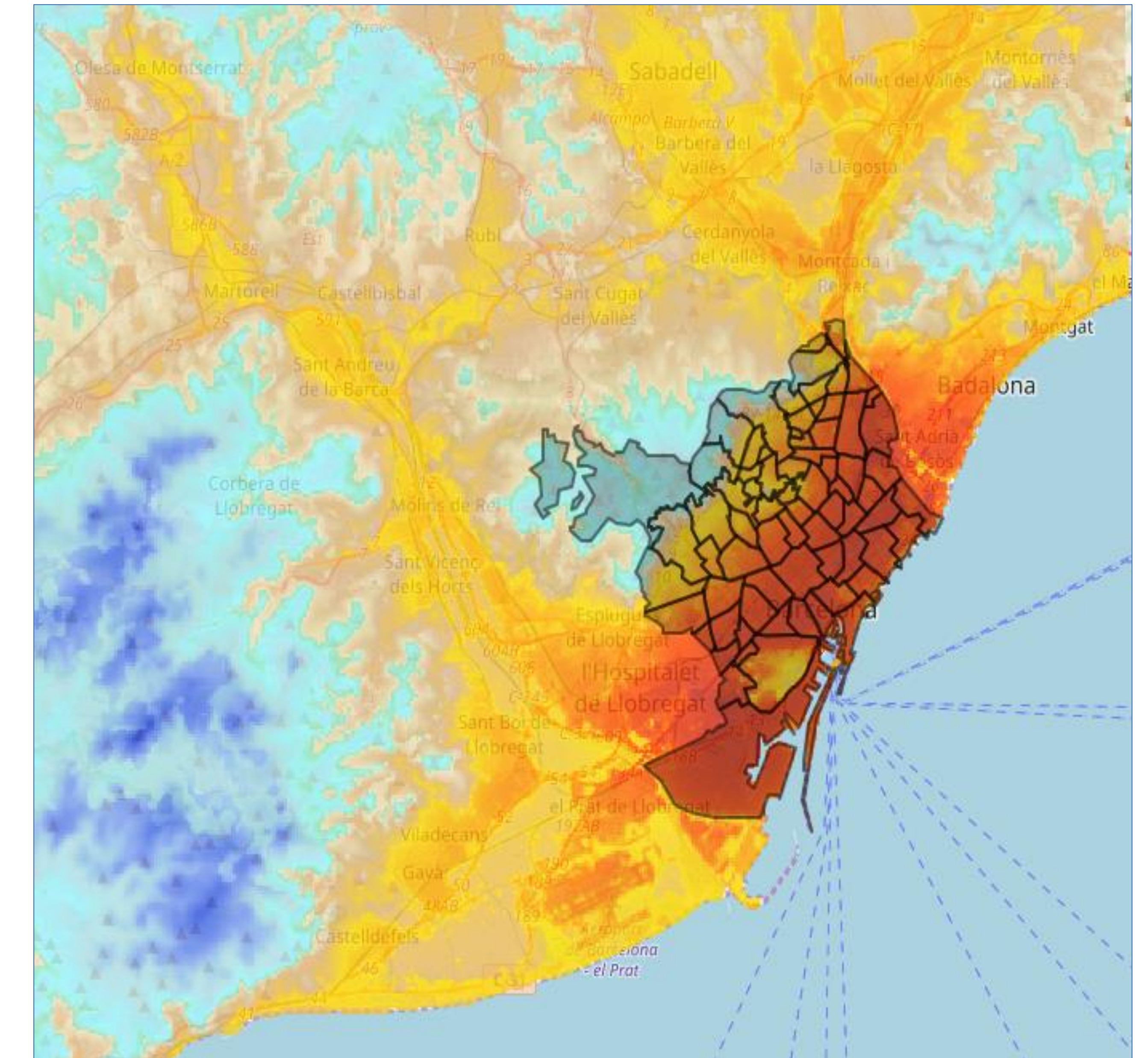
Climate Dynamics
Climate Teleconnections
Climate Predictability

Regional Climate Models



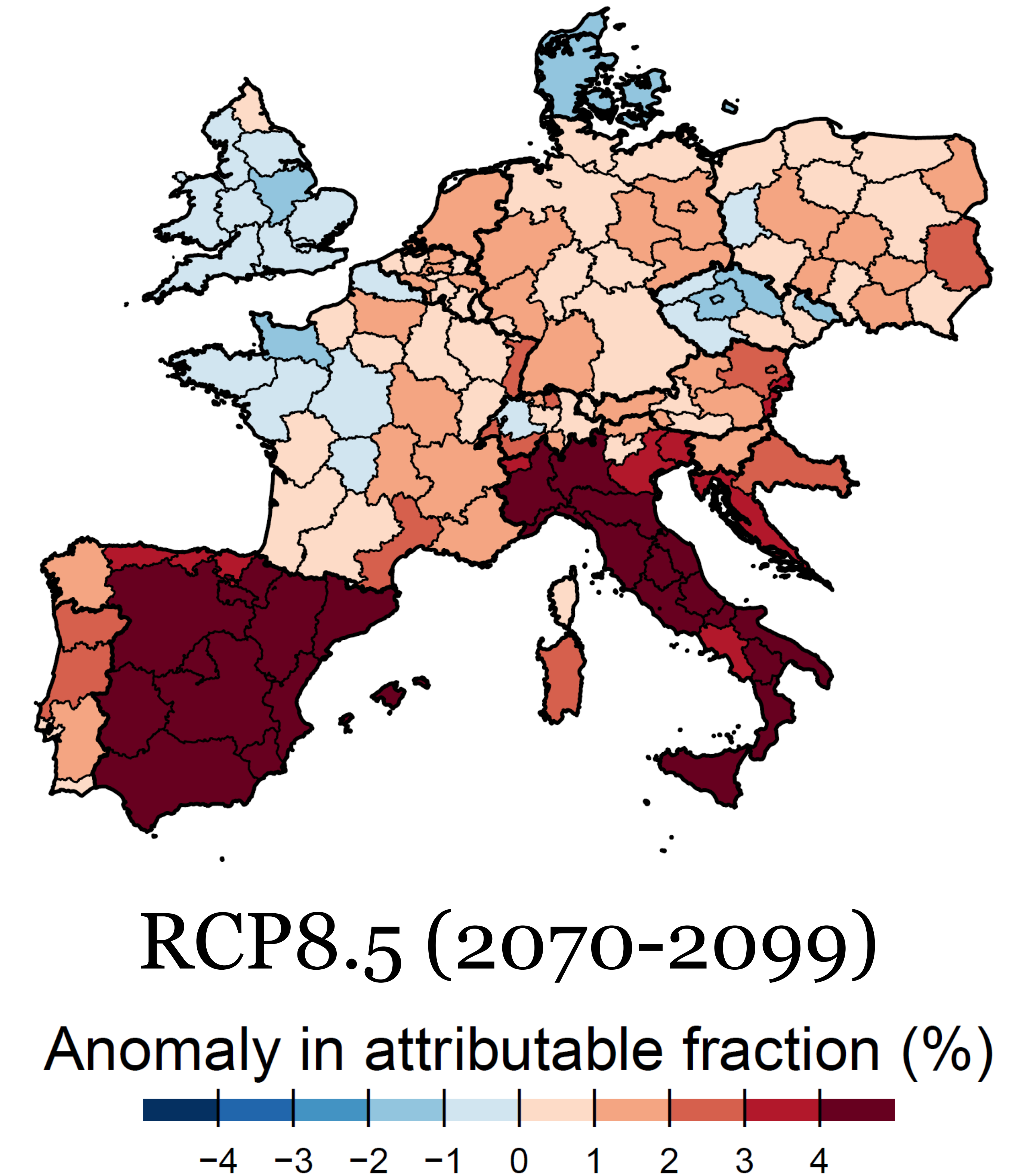
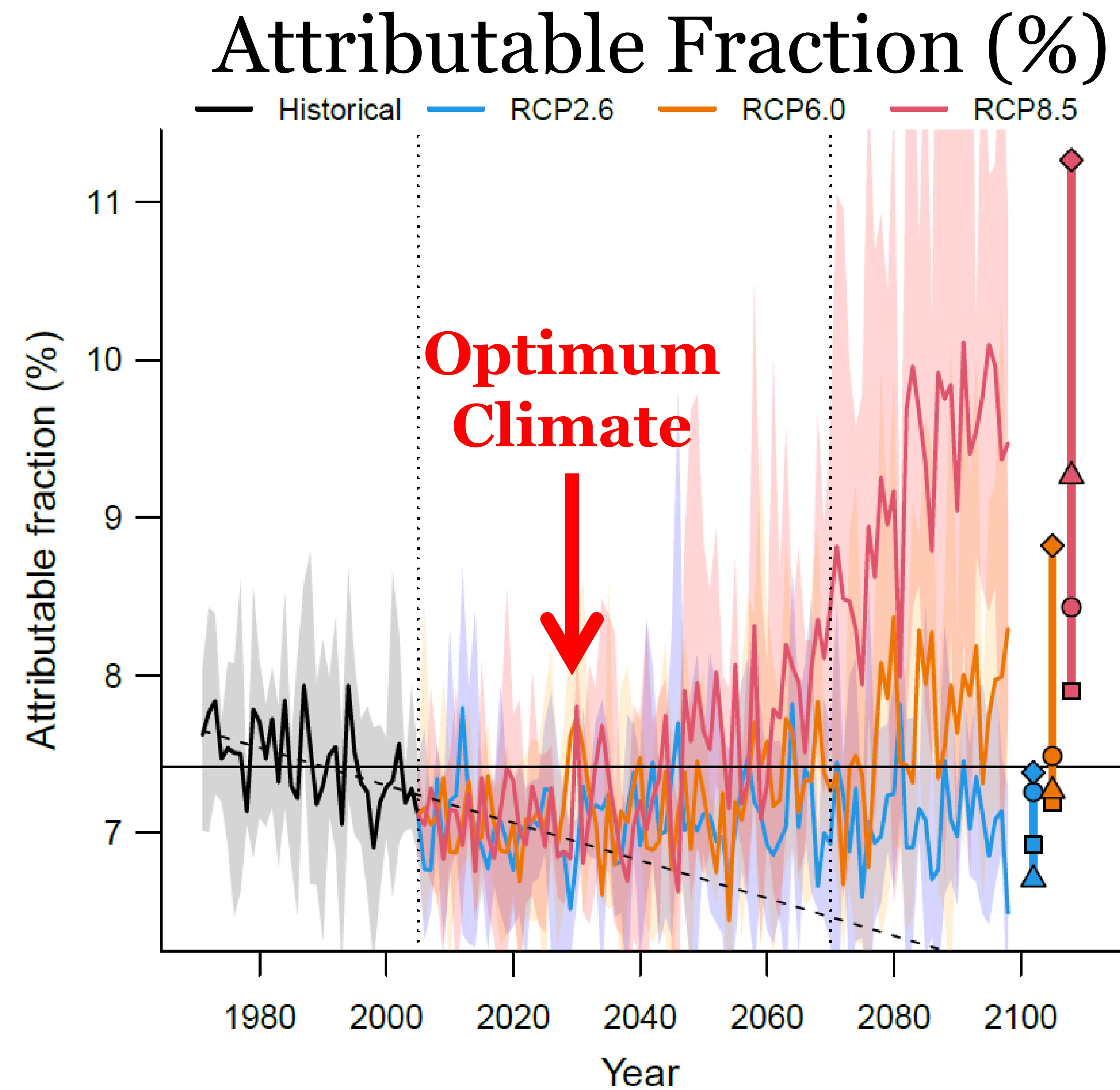
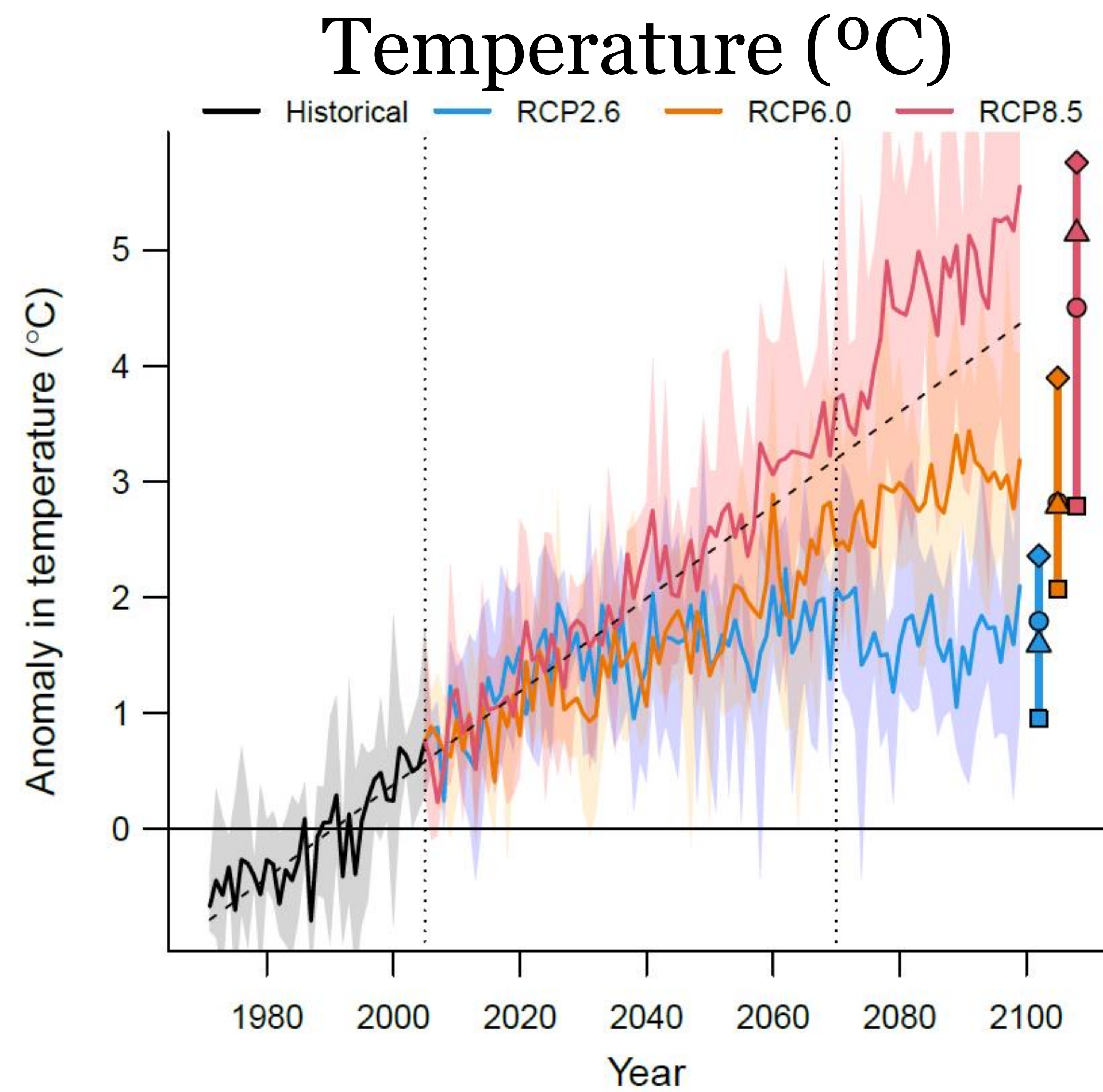
Climate Forecasting
Early Warning Systems
(e.g. see *heathealth.eu*)
Macroeconomy

Urban Climate Models



Urban Heat Island
Air Pollution
Social Inequalities

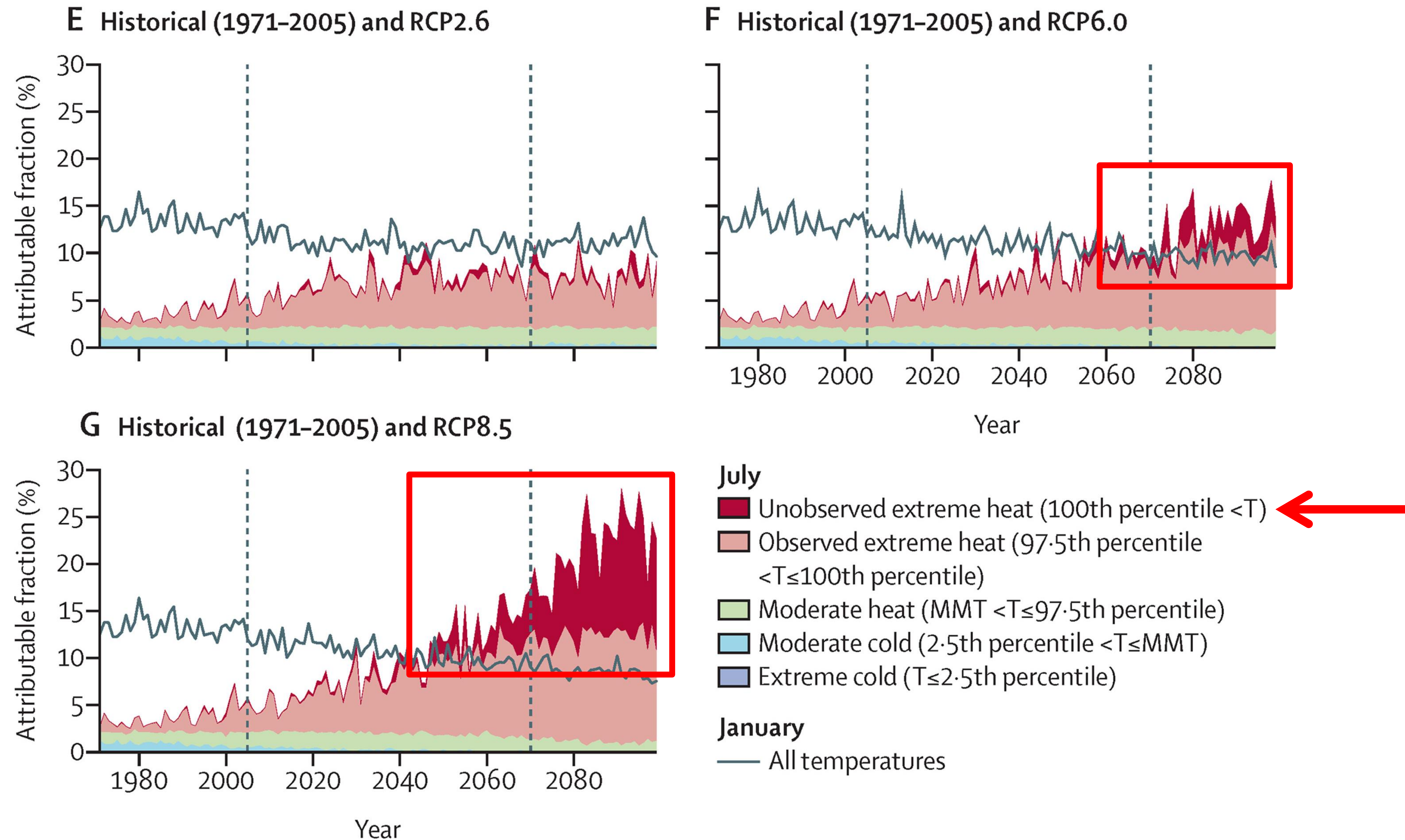
Temperature Attributable Mortality



Martínez-Solanas et al. (2021)
Lancet Planetary Health 5, e446-e454



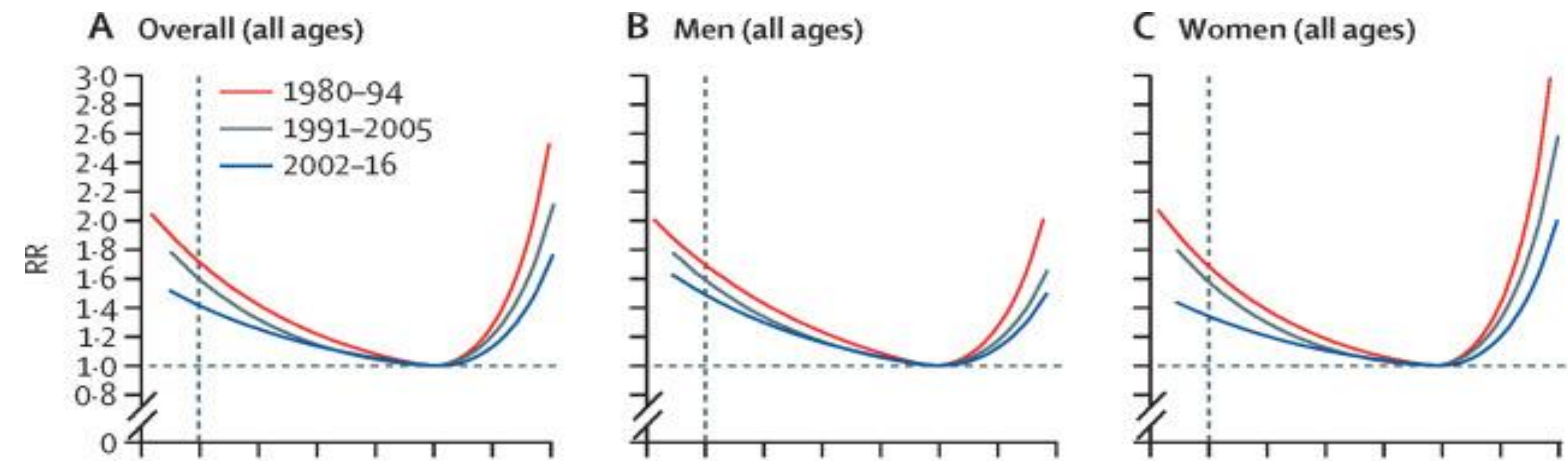
Tipping Points in Projections



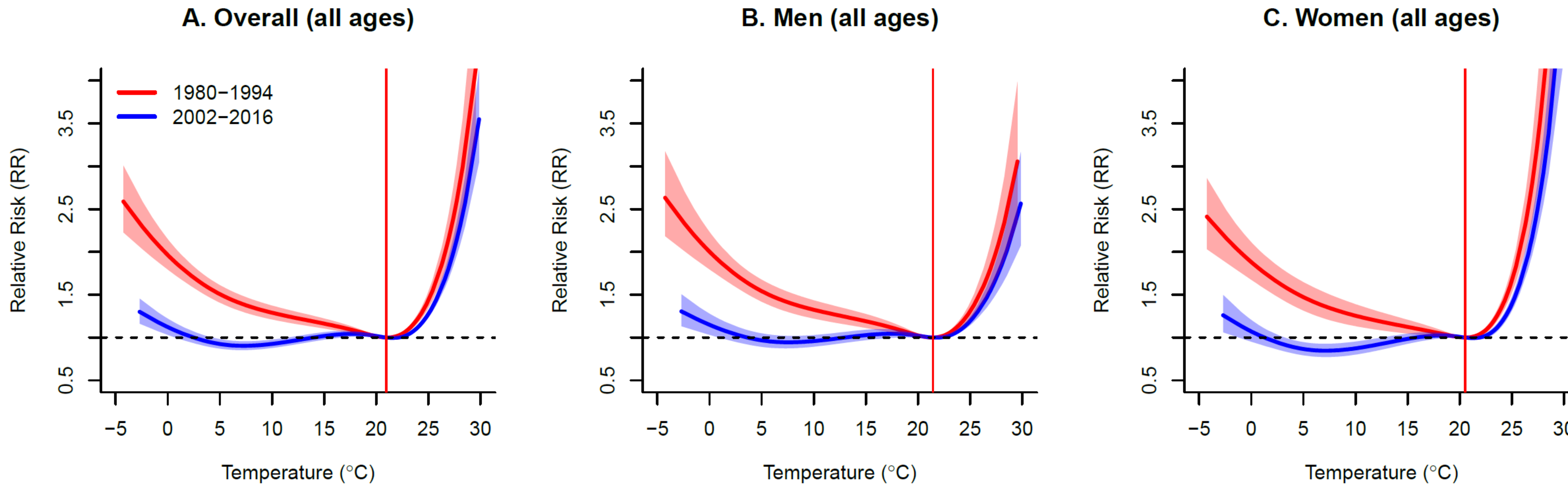
Quijal-Zamorano et al. (2021)
Lancet Planetary Health 5, e573–e575



Inequalities in Early Adaptation

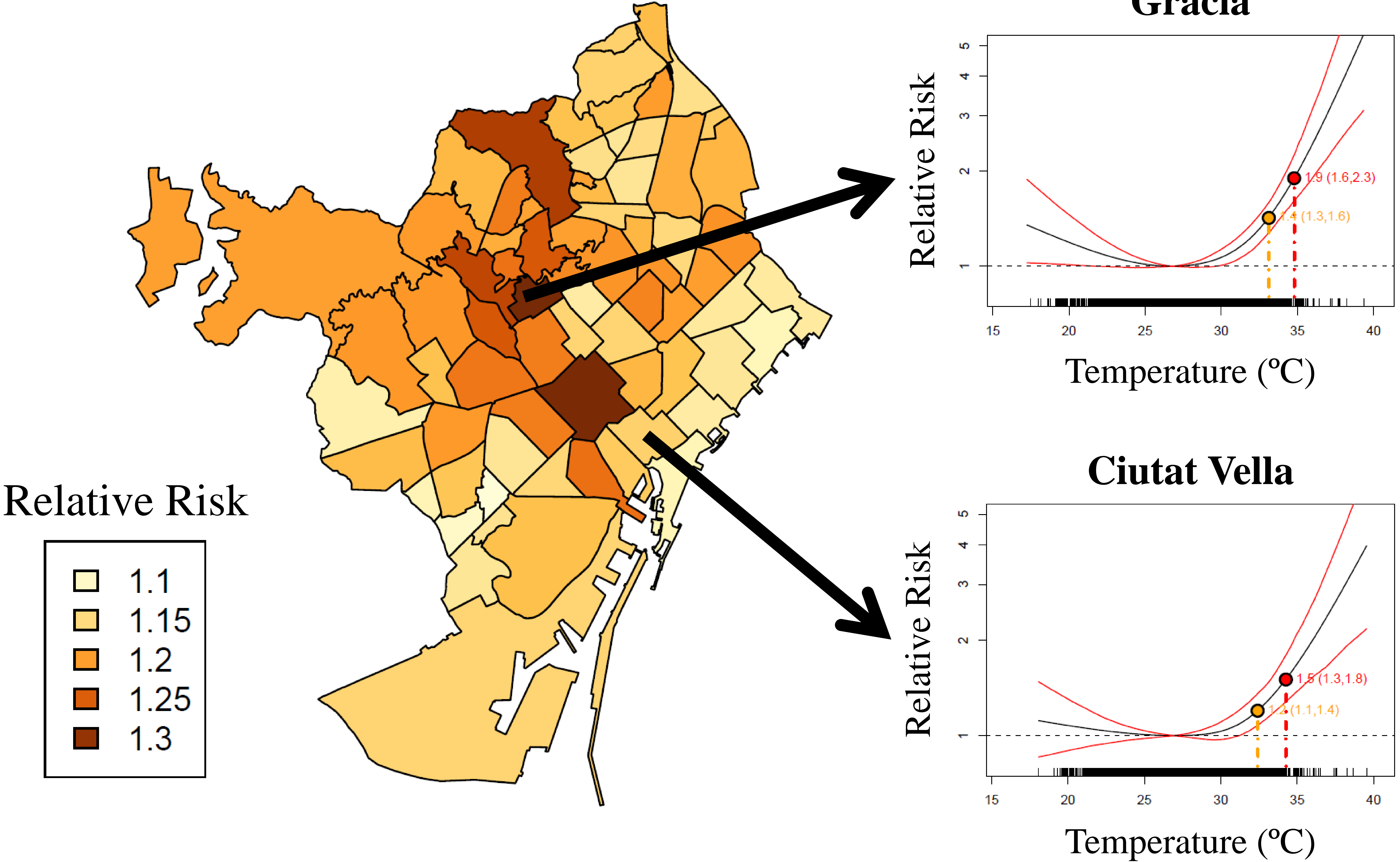


Top Row:
Cardiovascular Mortality
Achebak et al. (2019)
Lancet Planetary Health **3**, e297-e306



Bottom Row:
Respiratory Mortality
Achebak et al. (2020)
Nature Communications **11**, 2457

Inequalities in Early Adaptation

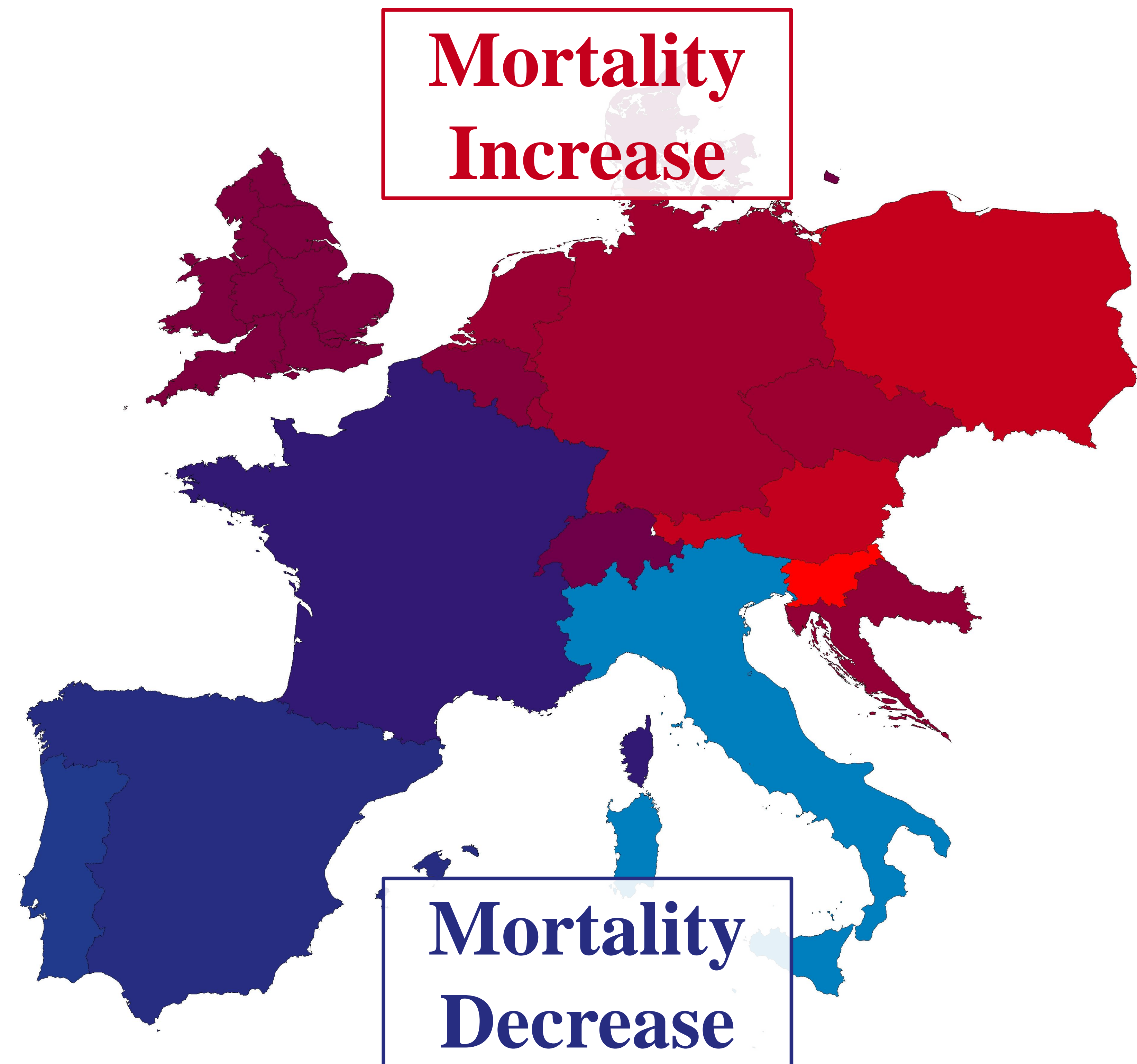


Quijal-Zamorano, Marí-Dell’Olmo et al.
Work in progress

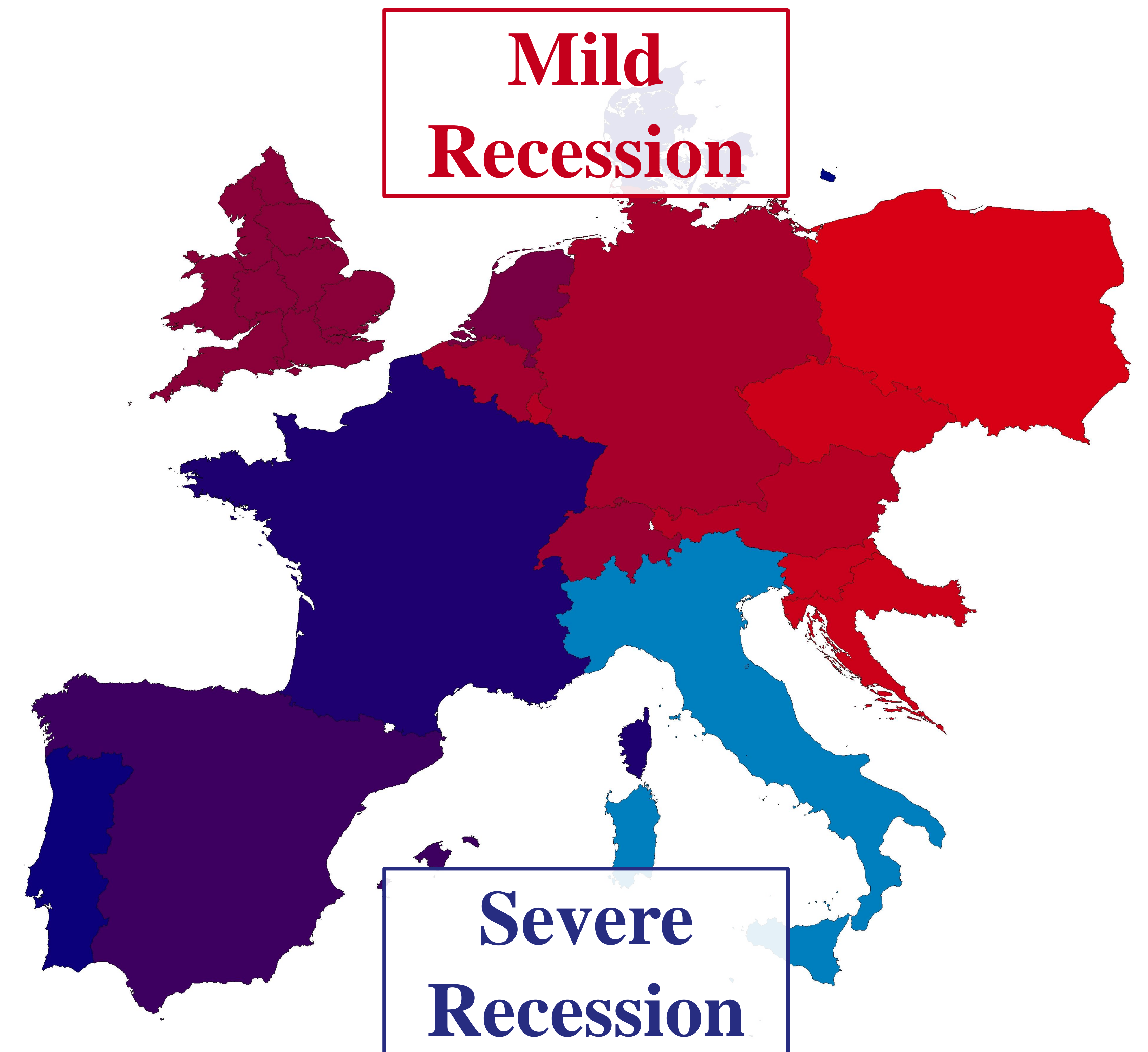


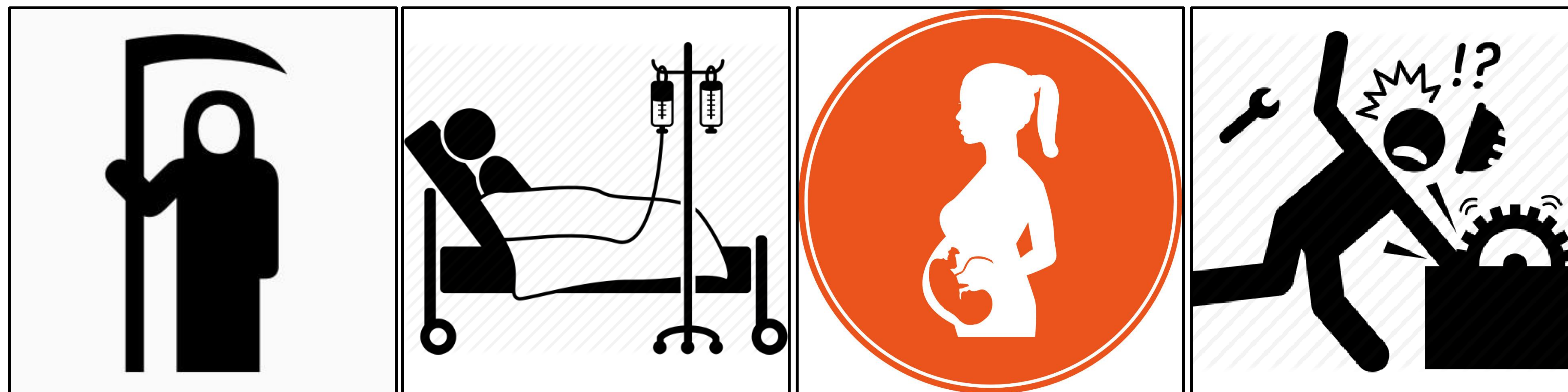
Inequalities in Early Adaptation

Trend in Heat Attributable Mortality



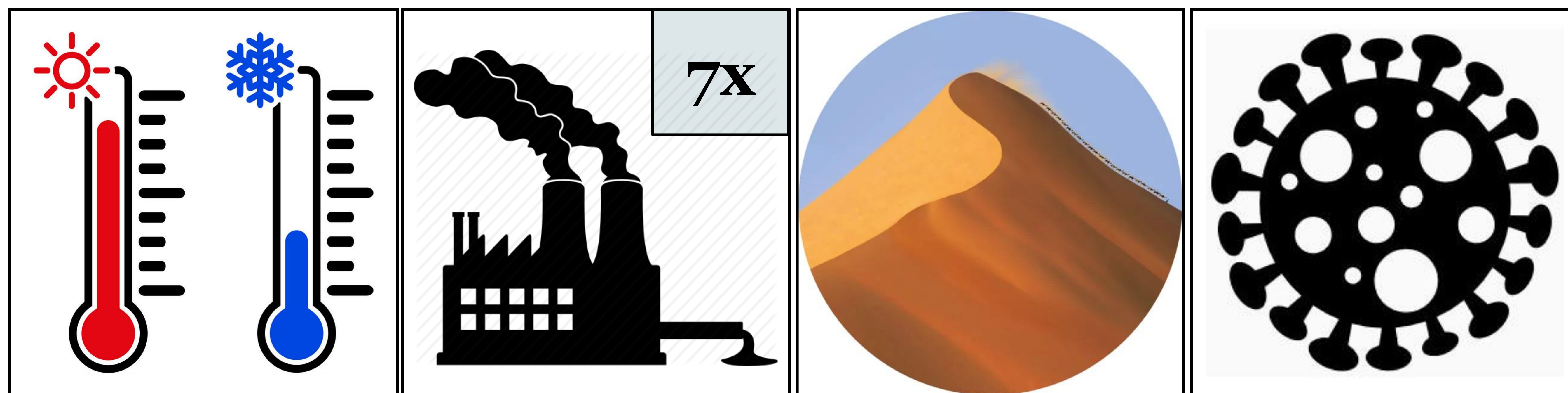
Growth in Real Gross Domestic Product





Daily Health Outcomes

- Deaths
- Hospitalizations
- Pregnancy / Births
- Occupational Accidents



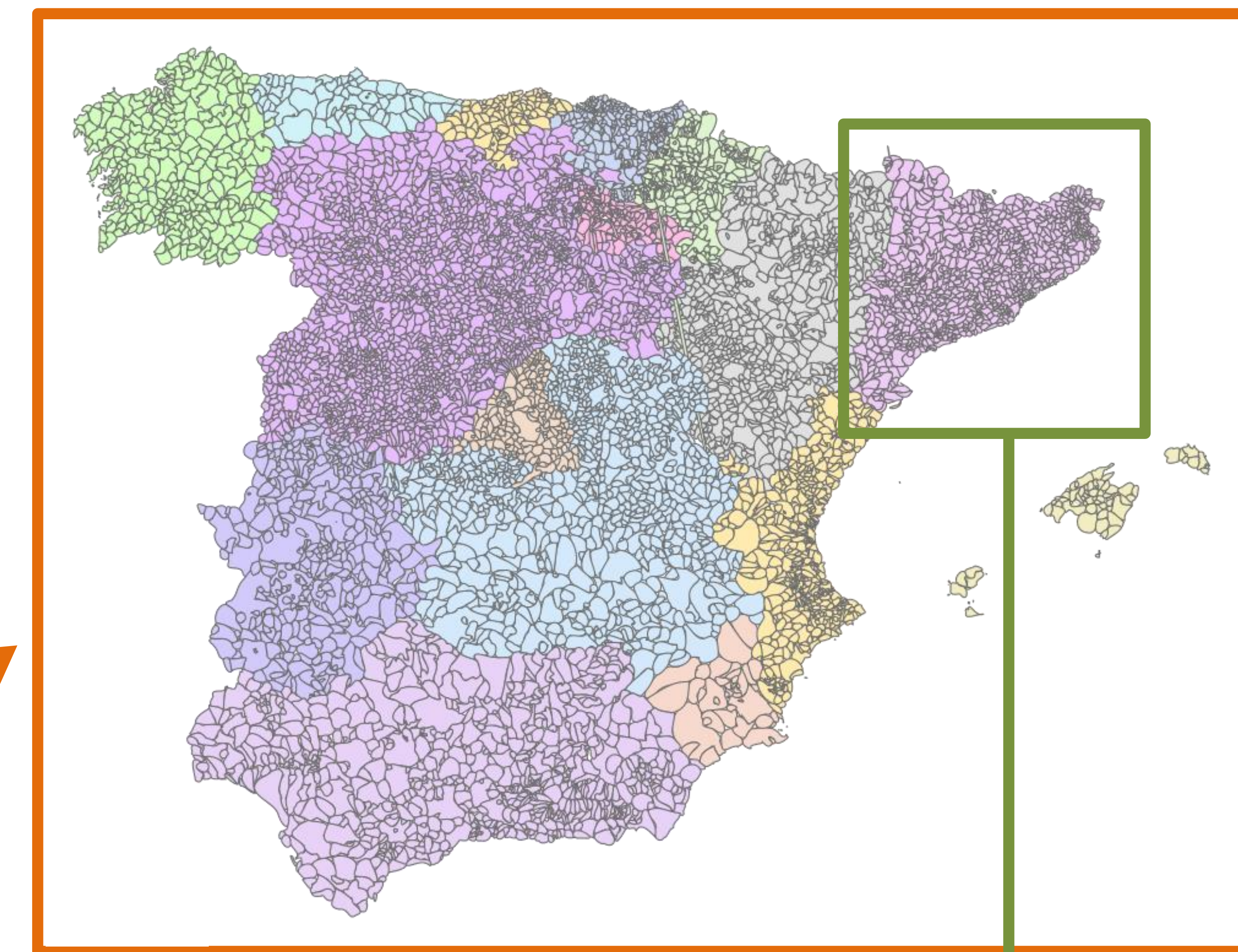
Daily Environmental Exposures

- Climate Variables
- Air Pollution
- Desert Dust
- Influenza-like Illnesses

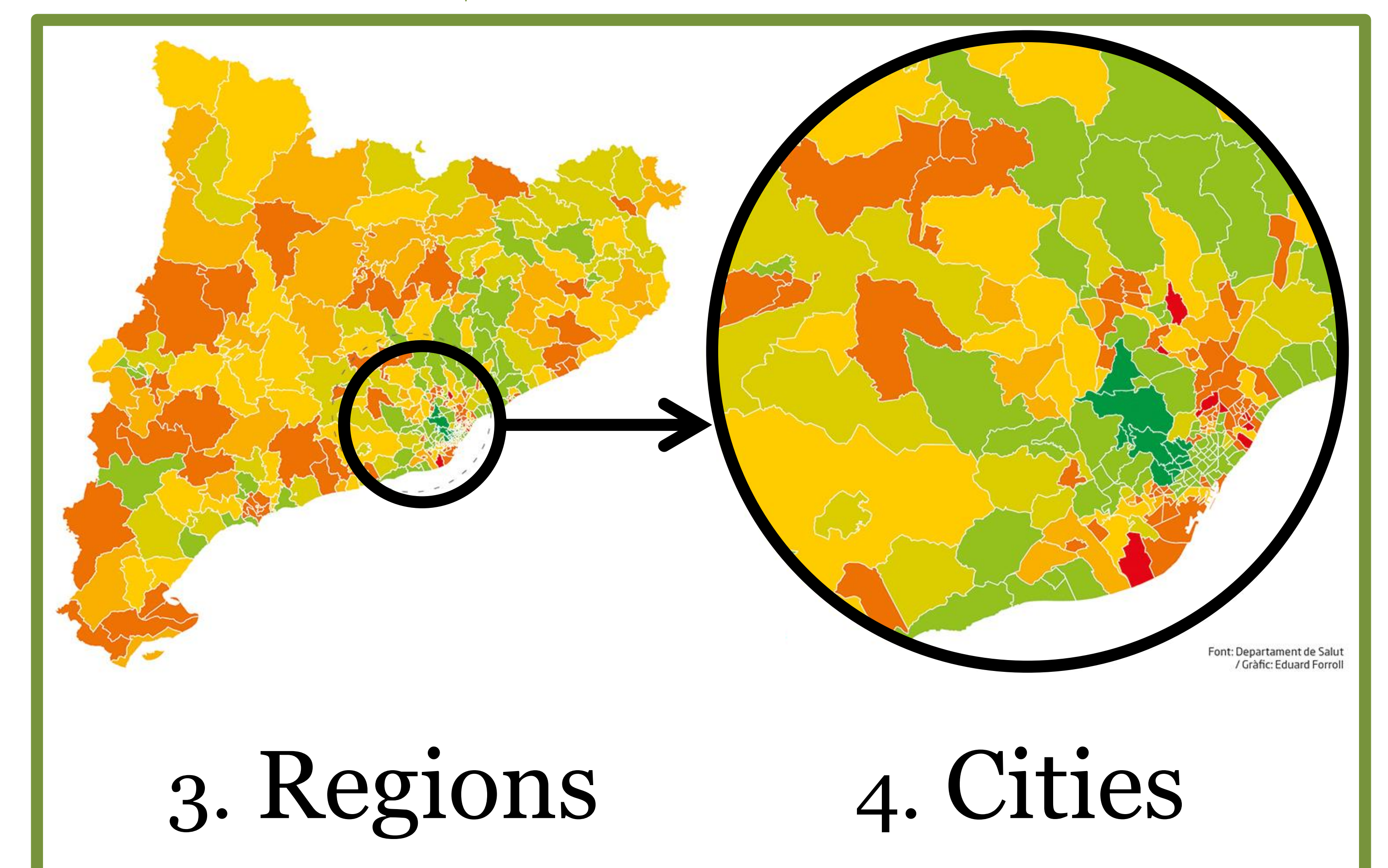


Societal Data

- Social Structure
- Economy
- Demography
- Inequalities, e.g. Gender Gap



Level 2.
Countries



Many Thanks !!



www.joanballester.eu
www.heathealth.eu
www.early-adapt.eu



European Research Council

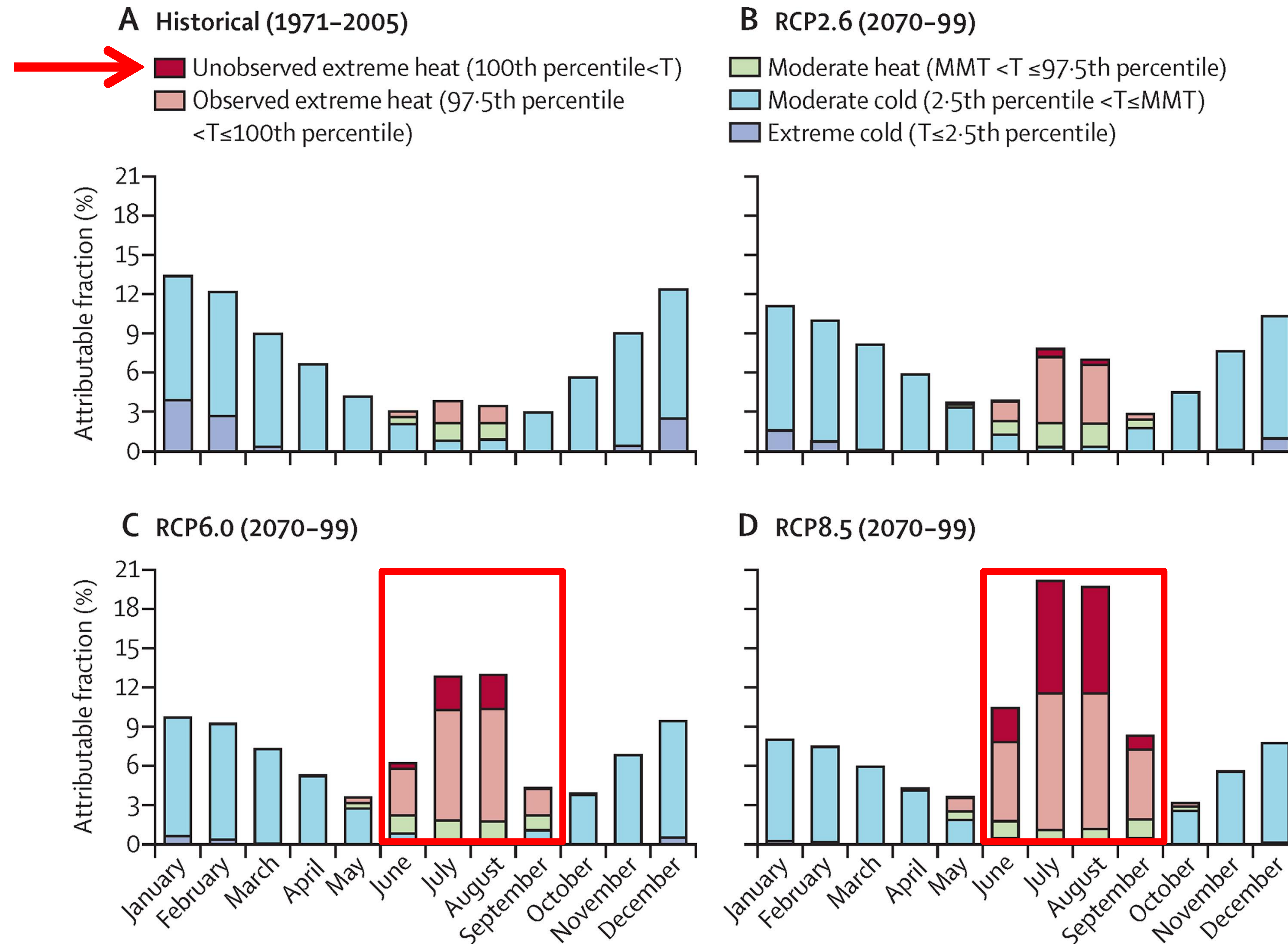
Established by the European Commission

ISGlobal **Barcelona**
Institute for
Global Health

EARLY-ADAPT has received funding from the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme (Grant agreement No. 865564)



Seasonality Changes in Projections



Quijal-Zamorano et al. (2021)
Lancet Planetary Health 5, e573–e575

