Temperature and health
Current and future challenges of a changing population in a changing climate

Ana M. Vicedo-Cabrera

Institute of Social and Preventive Medicine, University of Bern, Bern, Switzerland

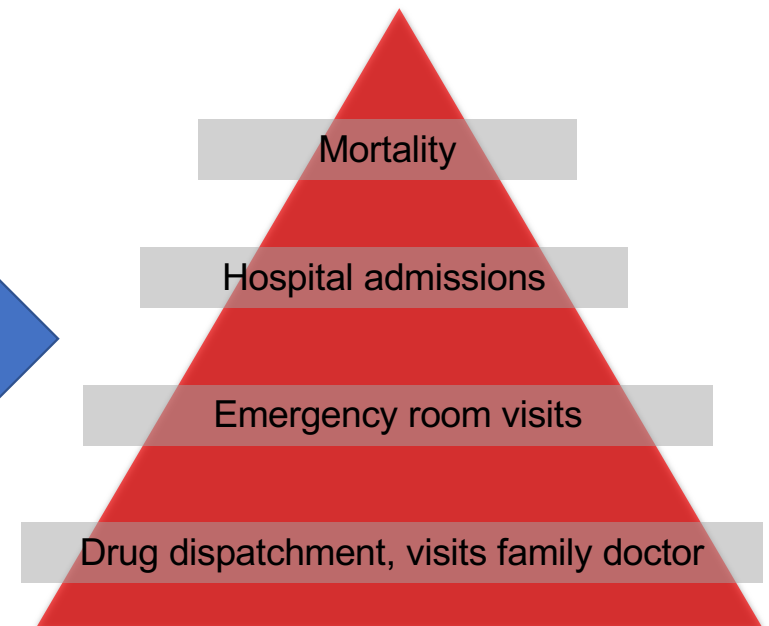Oeschger Center for Climate Change Research. University of Bern, Bern, Switzerland.
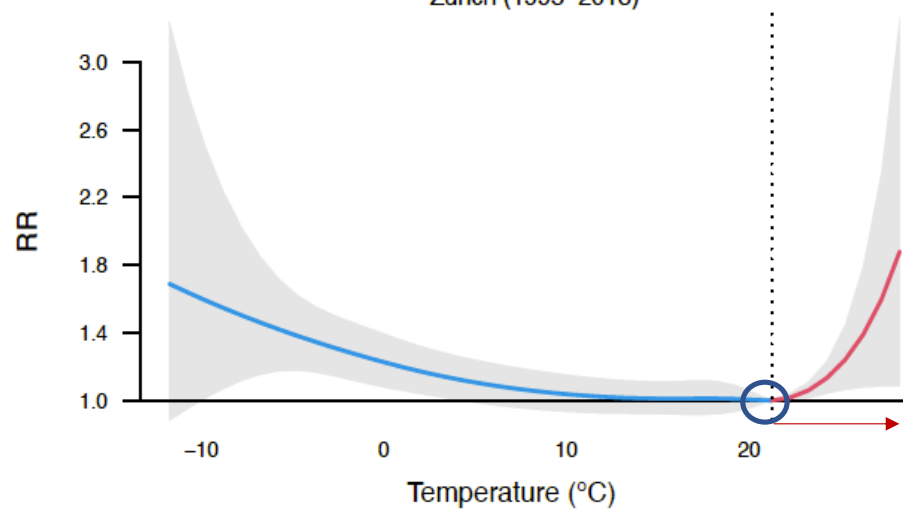
Climate Change & Health

Climate Change & Health - HEAT

Exposure to **HEAT**

Physiological response

Temperature–related mortality impacts
Zurich (1995–2013)

Mortality

Hospital admissions

Emergency room visits

Drug dispatchment, visits family doctor

Indirect impacts:
- Health system
- Economic costs
- Labor productivity

Vulnerable populations:
- Elderly
- Children
- Pregnant women
- Chronic patients
- Workers (outdoors)

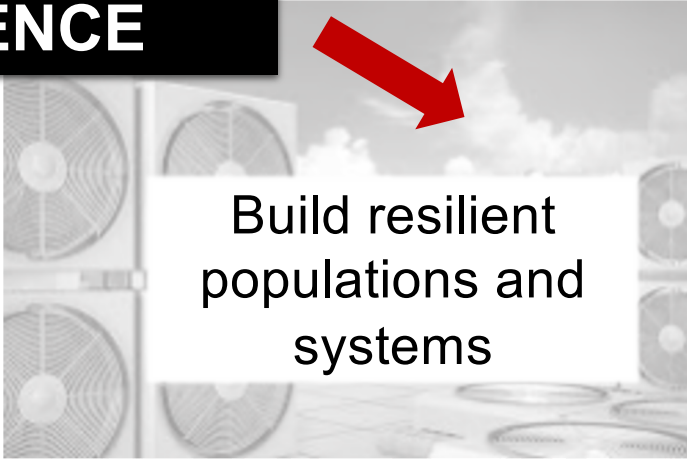# THE ROLE OF PUBLIC HEALTH

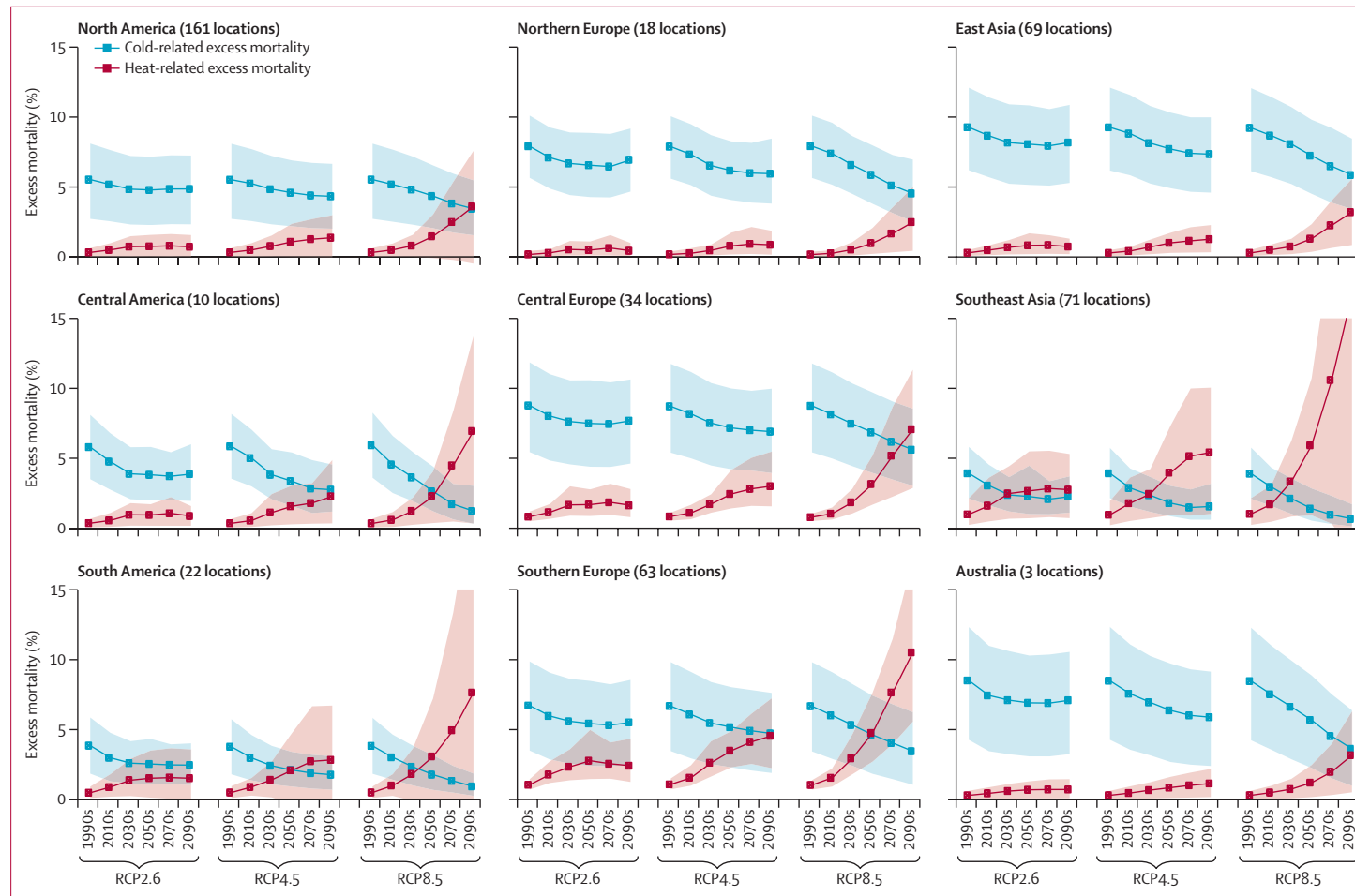Anticipate impacts
Provide solutions

REGULATORY SCIENCE

PROJECTIONS OF HEALTH IMPACTS

Build resilient populations and systems

HEALTH IMPACT PROJECTIONS

Temperature-related mortality
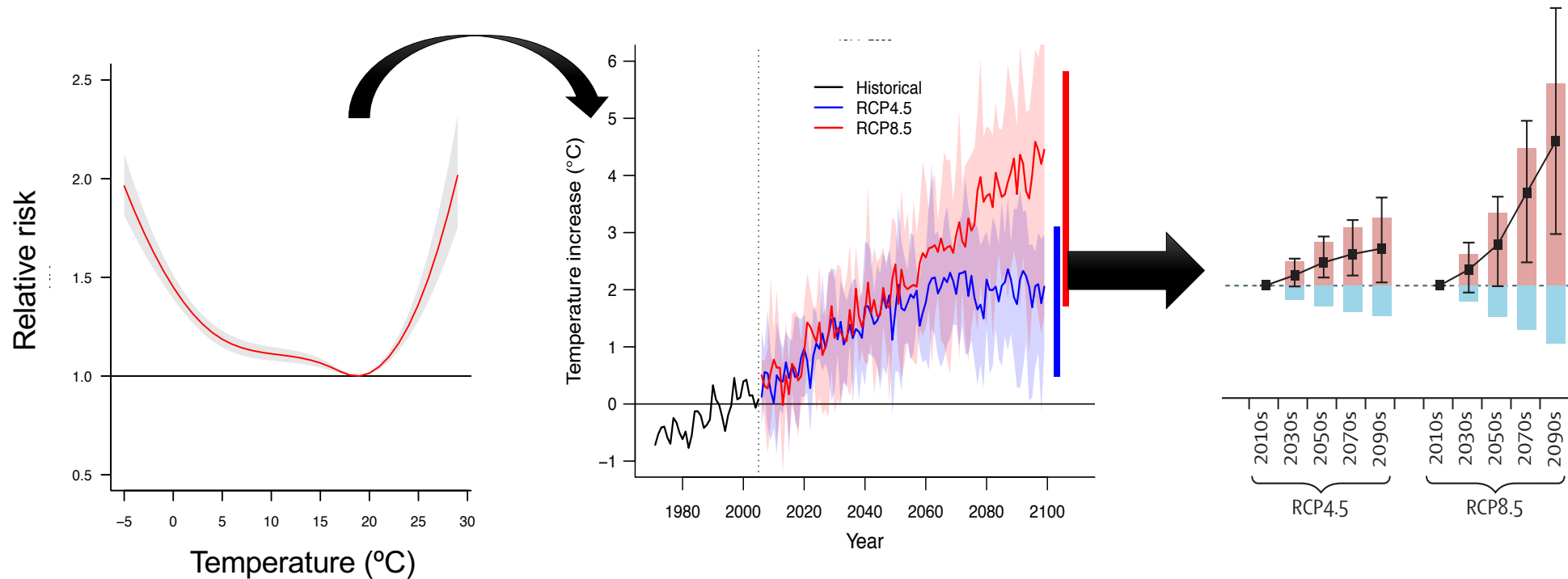

Gasparrini et al. 2017
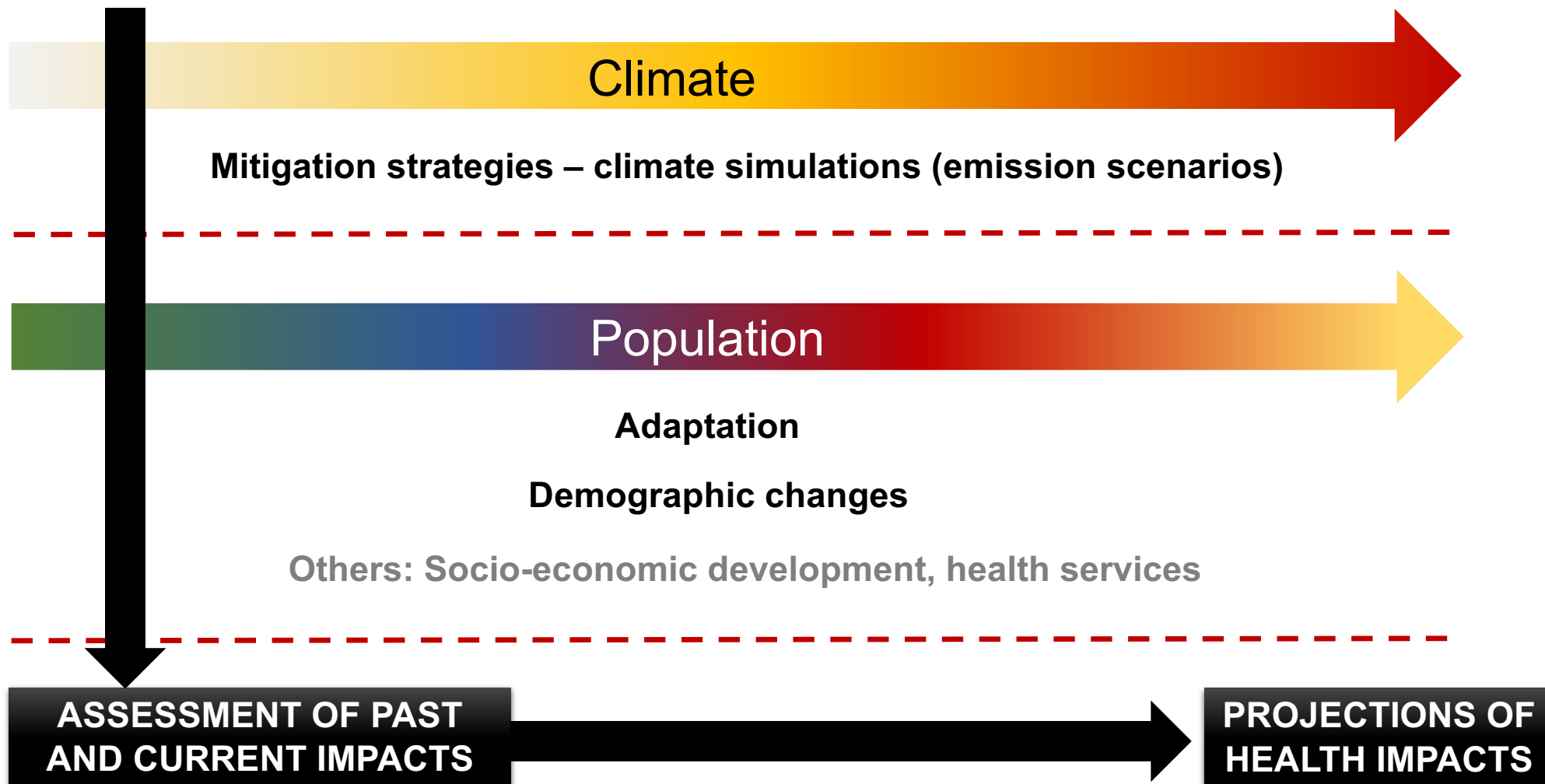
HEALTH IMPACT PROJECTIONS

Hands-on Tutorial on a Modeling Framework for
Projections of Climate Change Impacts on Health

Ana M. Vicedo-Cabrera,[a] Francesco Sera,[a] and Antonio Gasparrini[a,b]
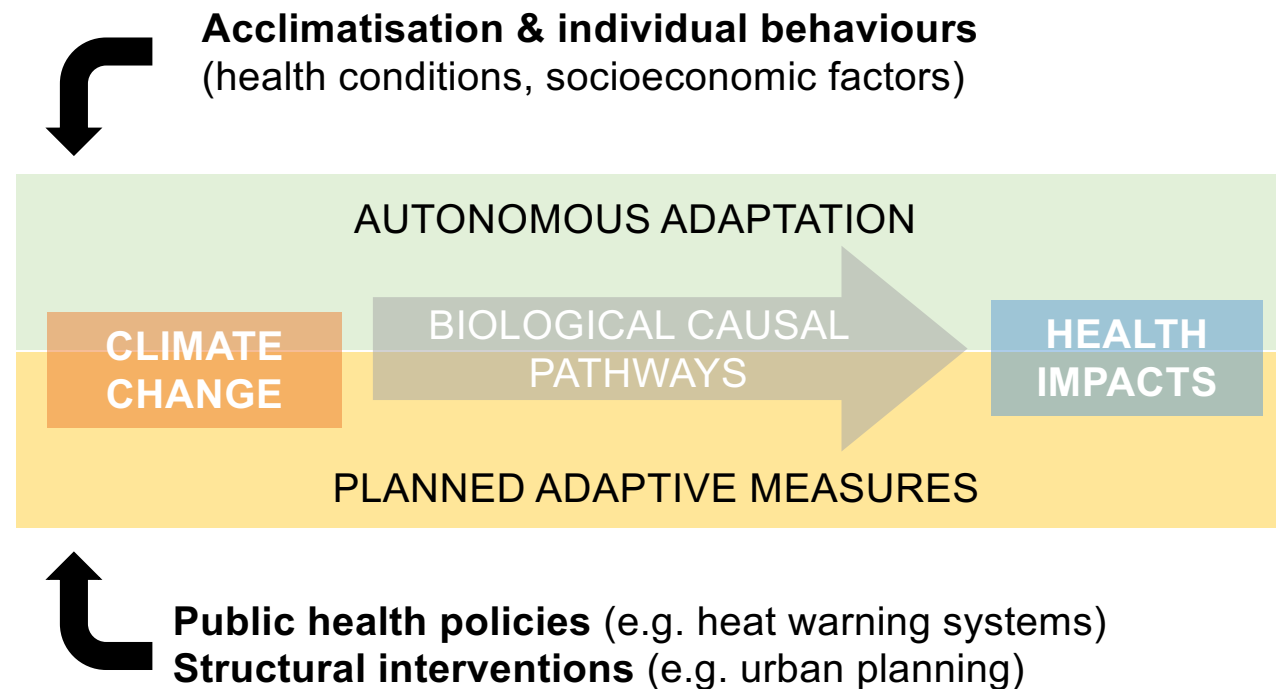
THE METHODOLOGICAL FRAMEWORK

Vicedo-Cabrera et al. 2019

From today to future: HEALTH IMPACT PROJECTIONS

Climate

Mitigation strategies – climate simulations (emission scenarios)

Population

Adaptation

Demographic changes

Others: Socio-economic development, health services

ASSESSMENT OF PAST AND CURRENT IMPACTS

PROJECTIONS OF HEALTH IMPACTS

PAST & CURRENT HEALTH IMPACTS

ADAPTATION – DRIVERS?

- Complex mechanisms
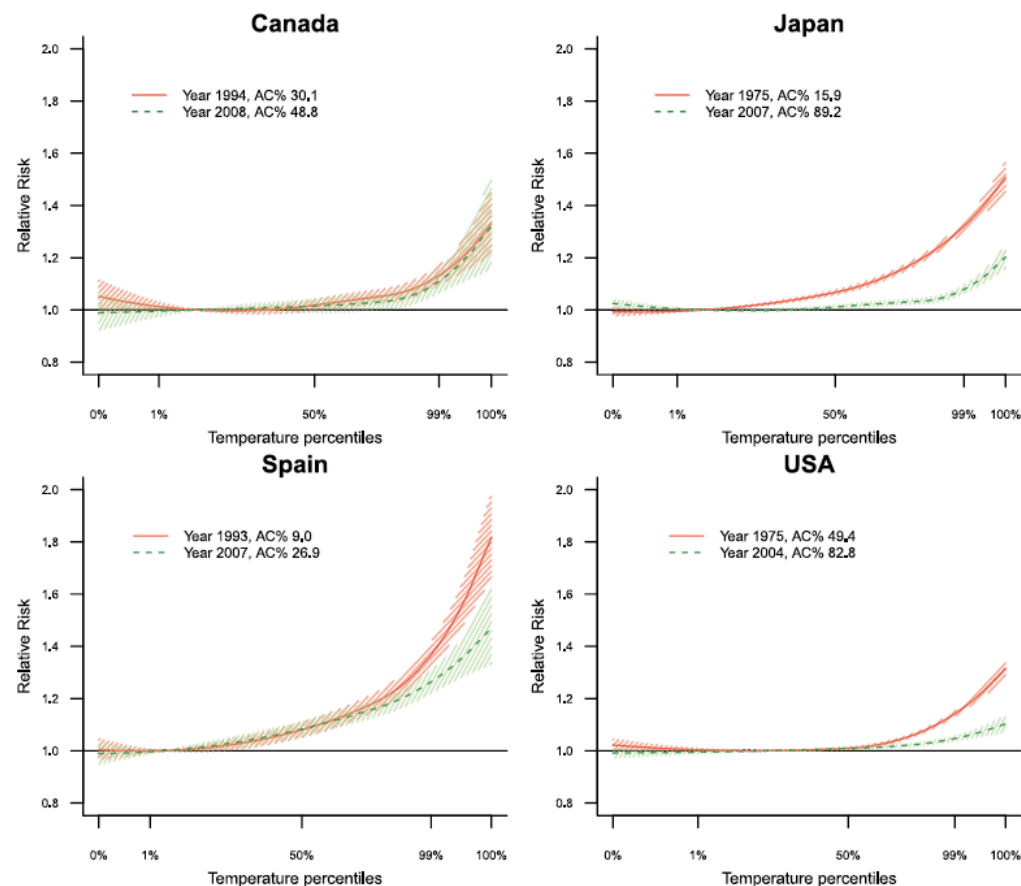- Lack of data
- Different patterns across populations

Acclimatisation & individual behaviours
(health conditions, socioeconomic factors)

AUTONOMOUS ADAPTATION

CLIMATE CHANGE

BIOLOGICAL CAUSAL PATHWAYS

HEALTH IMPACTS

PLANNED ADAPTIVE MEASURES

Public health policies (e.g. heat warning systems)
Structural interventions (e.g. urban planning)

PAST & CURRENT HEALTH IMPACTS
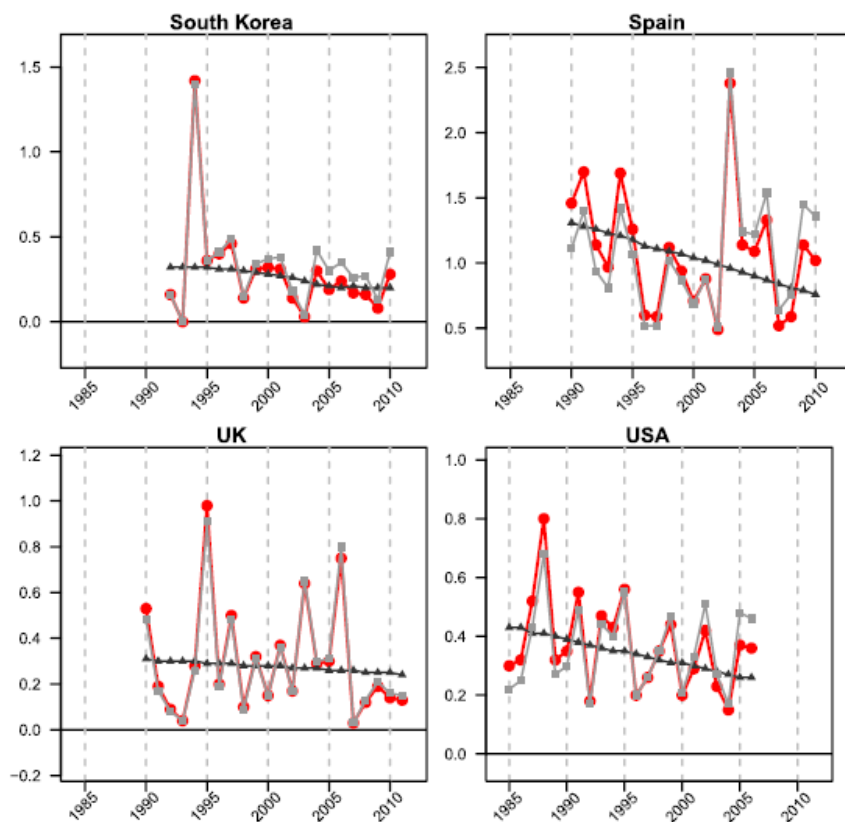
ADAPTATION

Vicedo-Cabrera et al. 2018

Sera et al. 2020

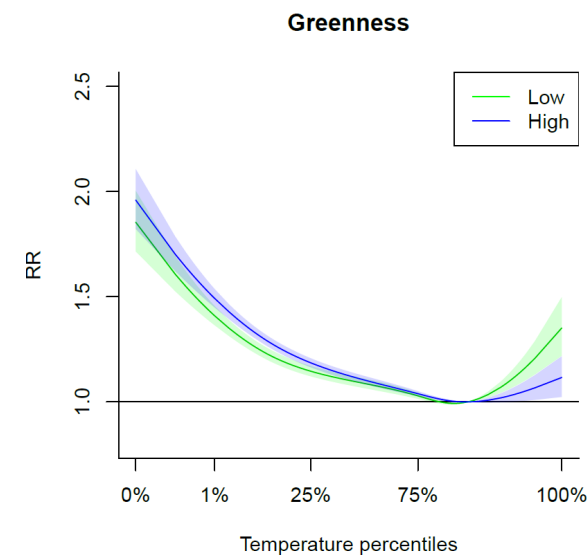# PAST & CURRENT HEALTH IMPACTS

ADAPTATION

Heat AF%
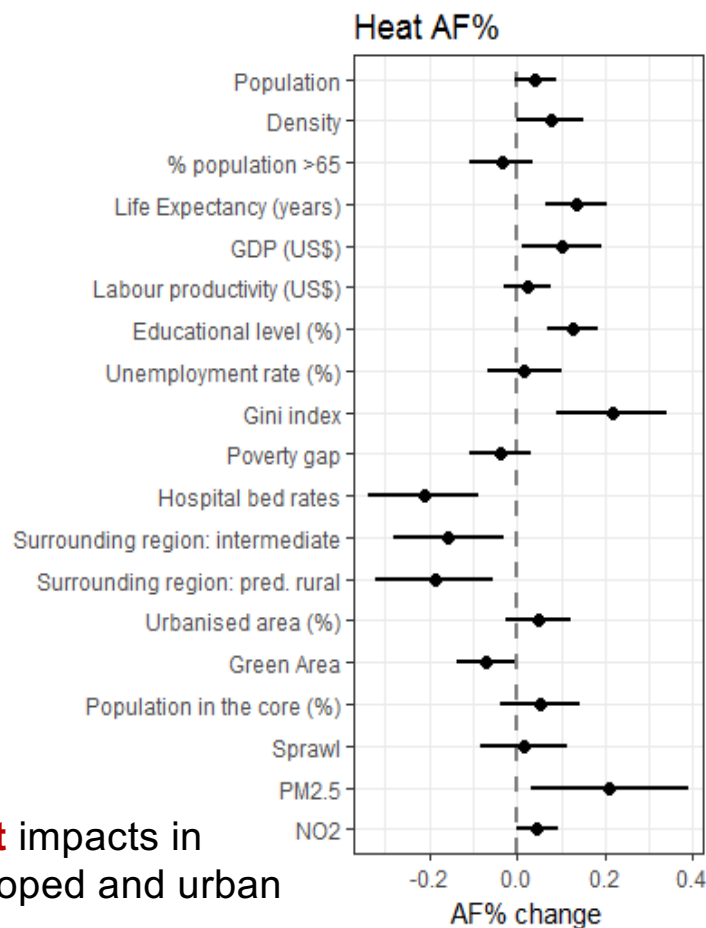
Sera et al. 2019 IJE

Larger **heat** impacts in more developed and urban cities
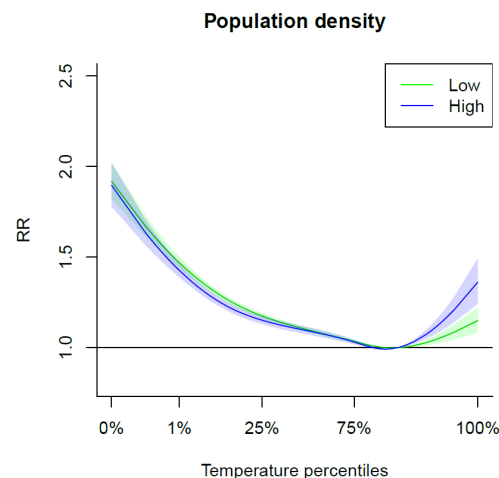
Higher vulnerability to **heat** in neighborhoods with **high population density** and **low greeness**

Scortichini et al. in preparation
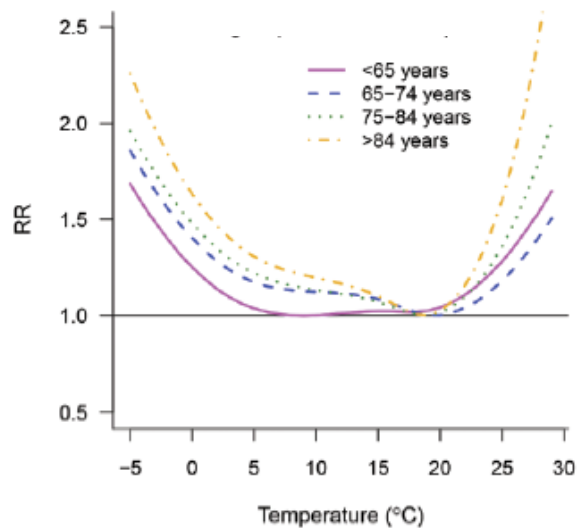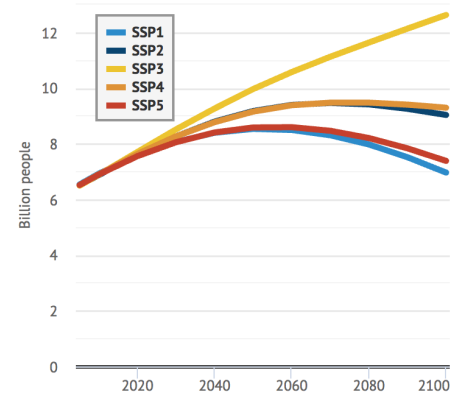
ADVANCING ON HEALTH IMPACT PROJECTIONS

Accounting for DEMOGRAPHIC CHANGES

Age-specific relationships

Shared Socio-economic Pathways (SSP)

https://www.carbonbrief.org/explainer-how-shared-socioeconomic-pathways-explore-future-climate-change
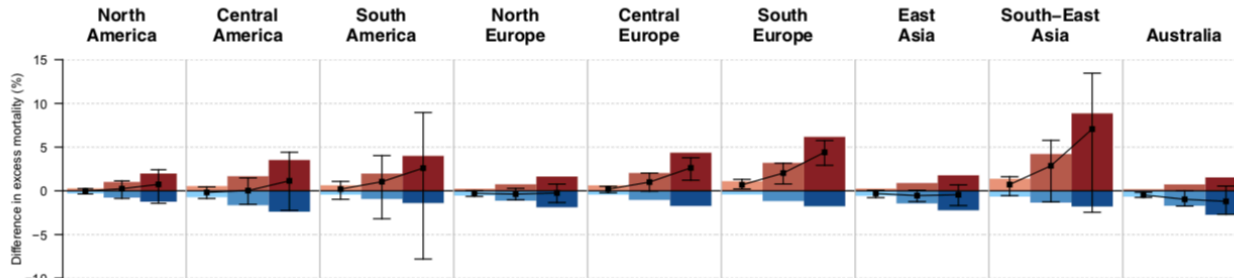
ADVANCING ON HEALTH IMPACT PROJECTIONS

Way forward → Additional uncertainties and complexities
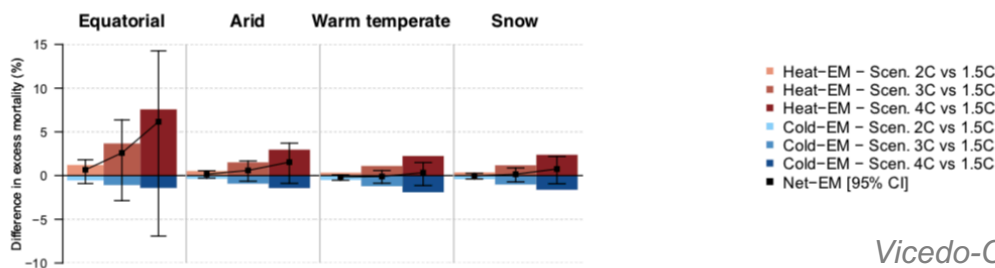
What about **COLD**?
- Direct & indirect mechanisms stay the same in the future?
- Cold-driven infectious diseases (e.g. flu) under climate change scenarios
- Public health interventions (vaccination)

Projecting other **health impacts** (hospitalizations)

Vicedo-Cabrera et al. 2018

Potential extensions

Forecasting health impacts for heat-health warning systems

Thank you very much

Ana M. Vicedo-Cabrera, PhD

Institute of Social and Preventive Medicine
Oeschger Center for Climate Change research
University of Bern

u^b

UNIVERSITY
OF BERN

anamaria.vicedo@ispm.unibe.ch

@AnaVicedo9