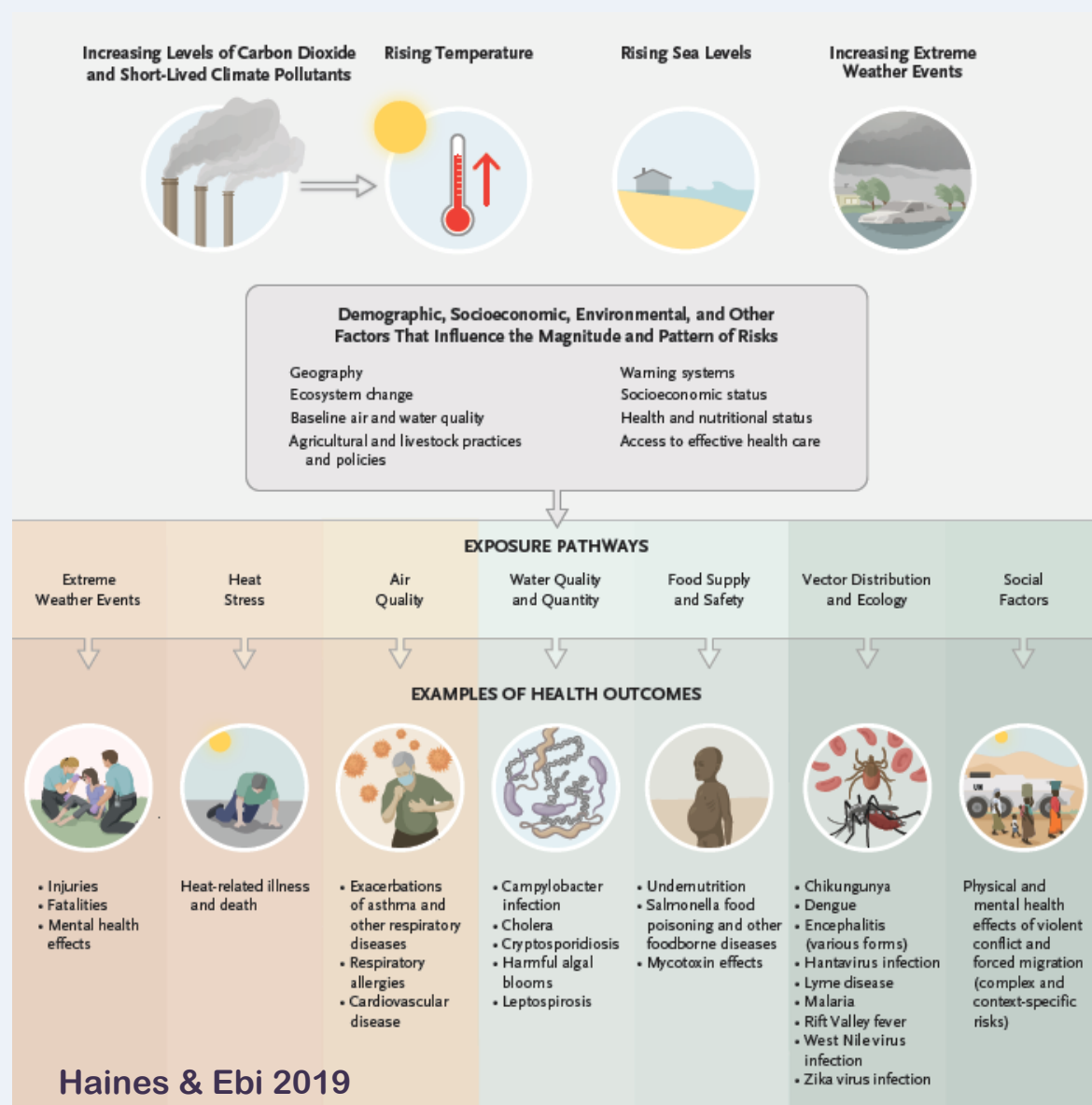


Health detection and attribution

Kristie L. Ebi, Ph.D., MPH
University of Washington

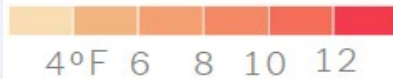


IPCC 2022

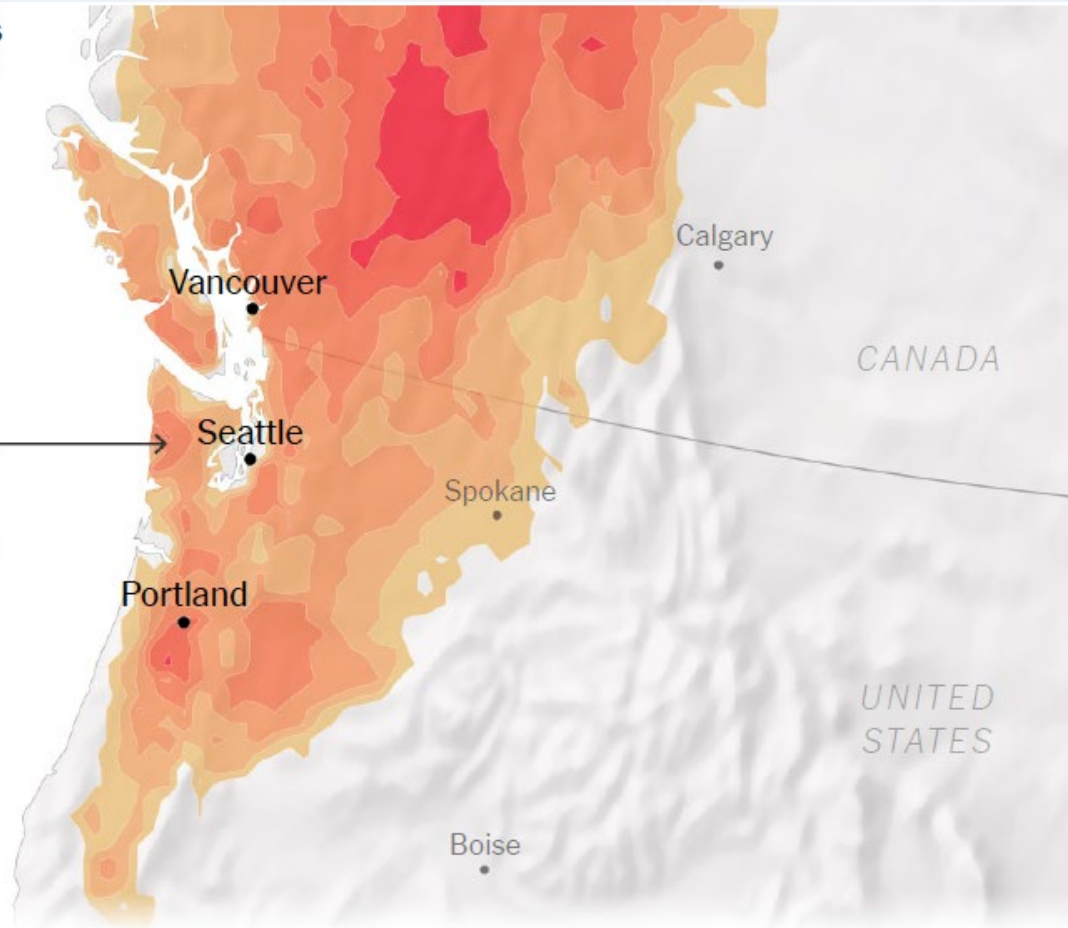


<https://www.worldweatherattribution.org>

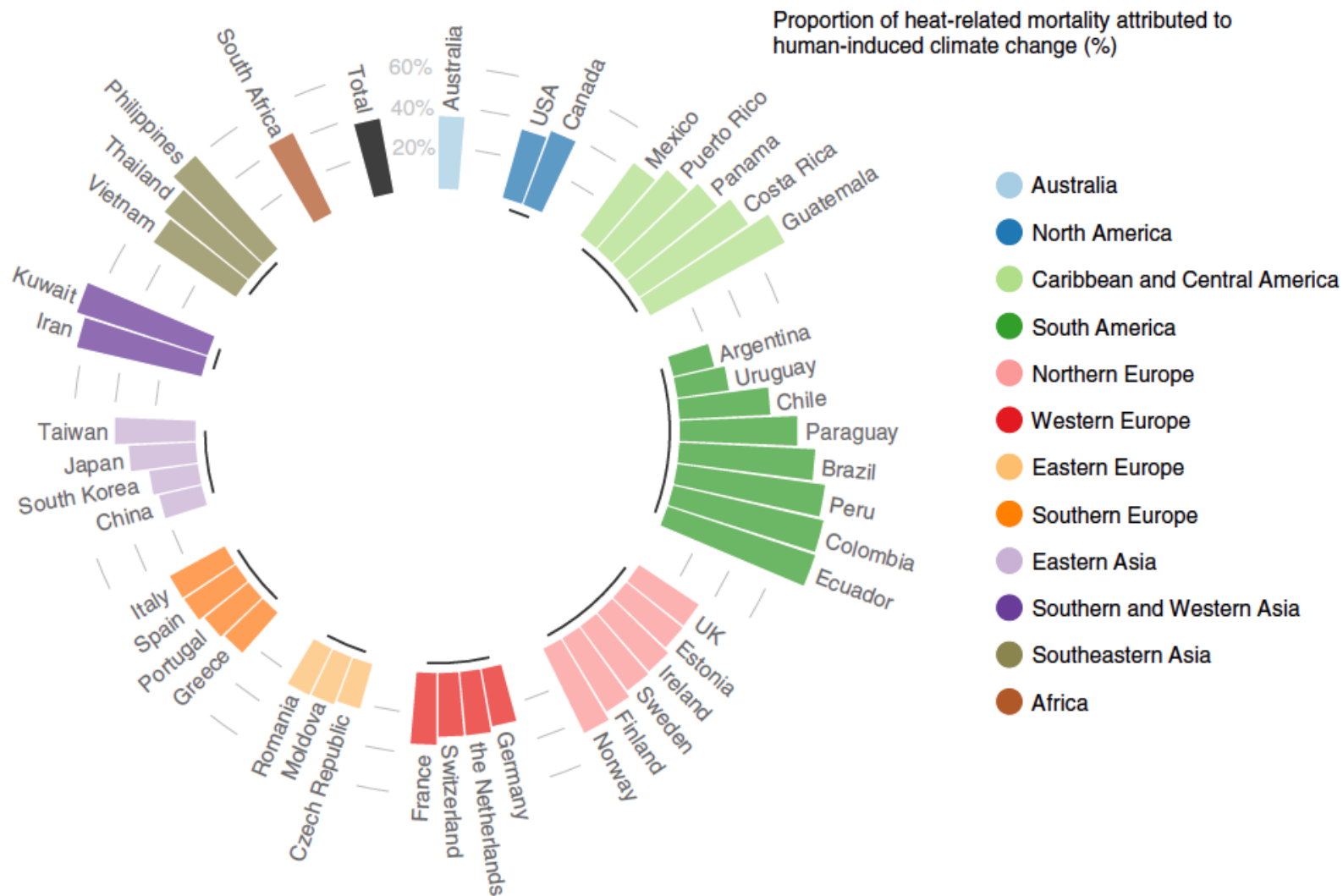
By how much the record was broken in June compared to the highest temperatures in 1950-2020



This year's historic heat wave in the Pacific Northwest broke previous records by more than 10 degrees.

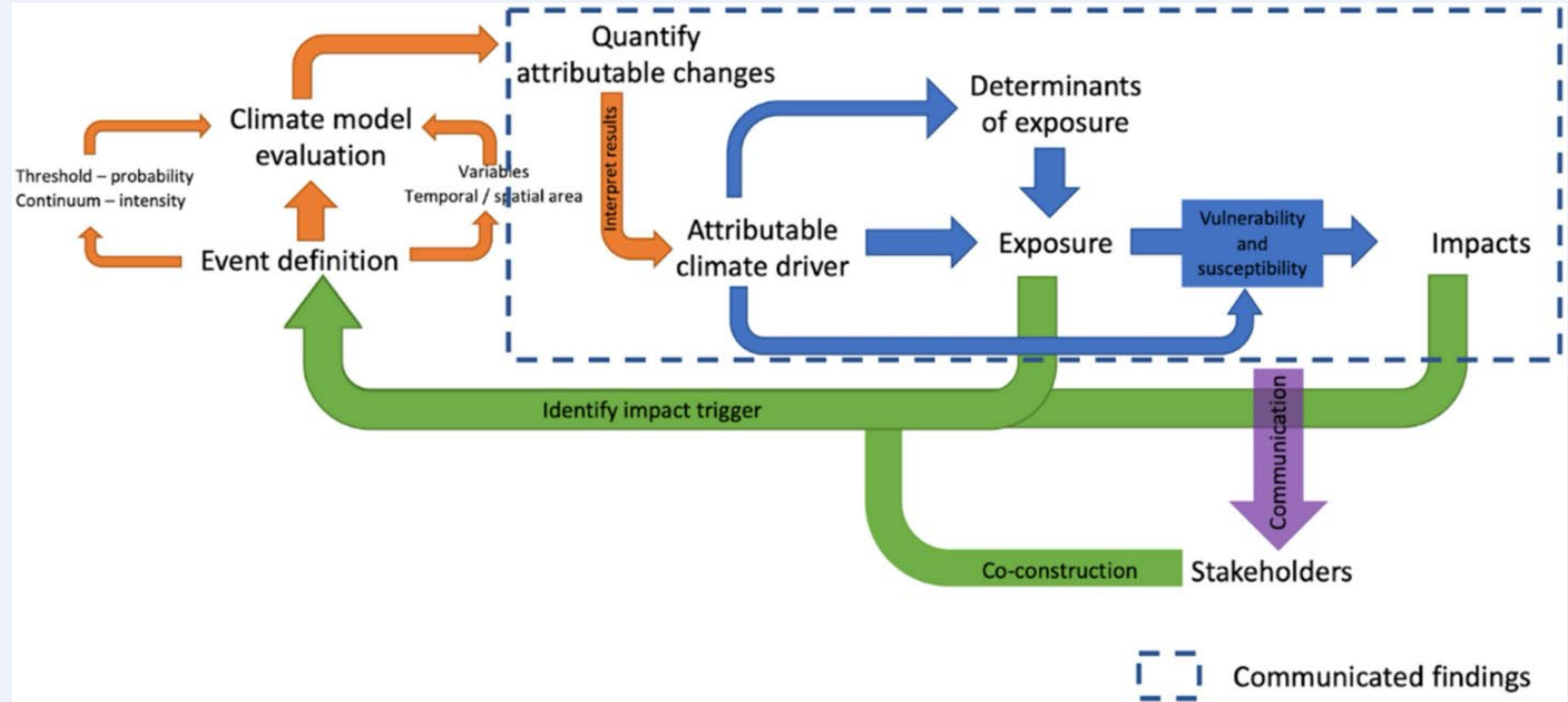


Source: ERA5 reanalysis (Copernicus/ECMWF) by Geert Jan van Oldenborgh.



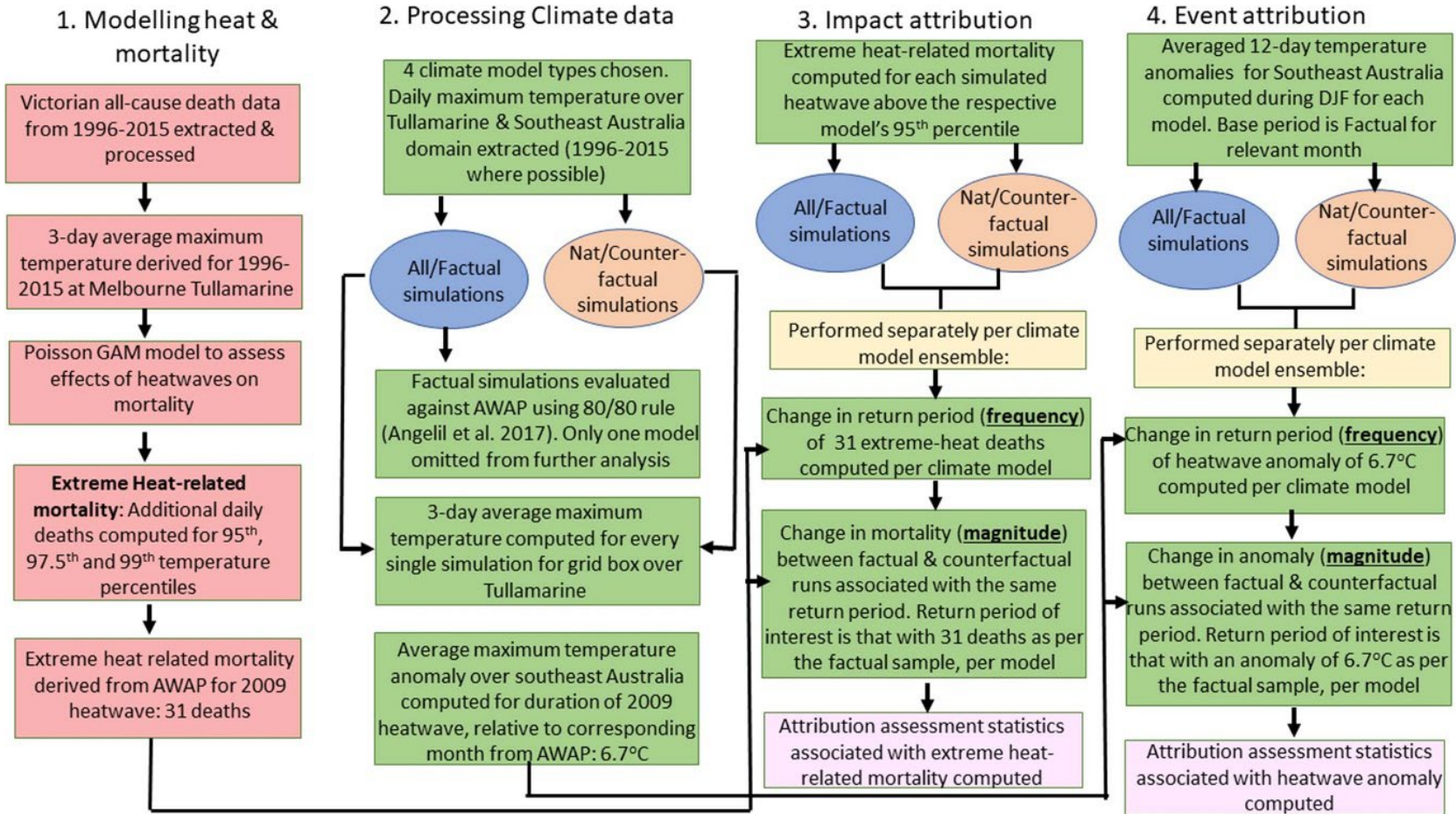
Draft framework for attributing health impacts of extreme events to climate change

Different colors denote the different disciplines required for a successful impact attribution assessment

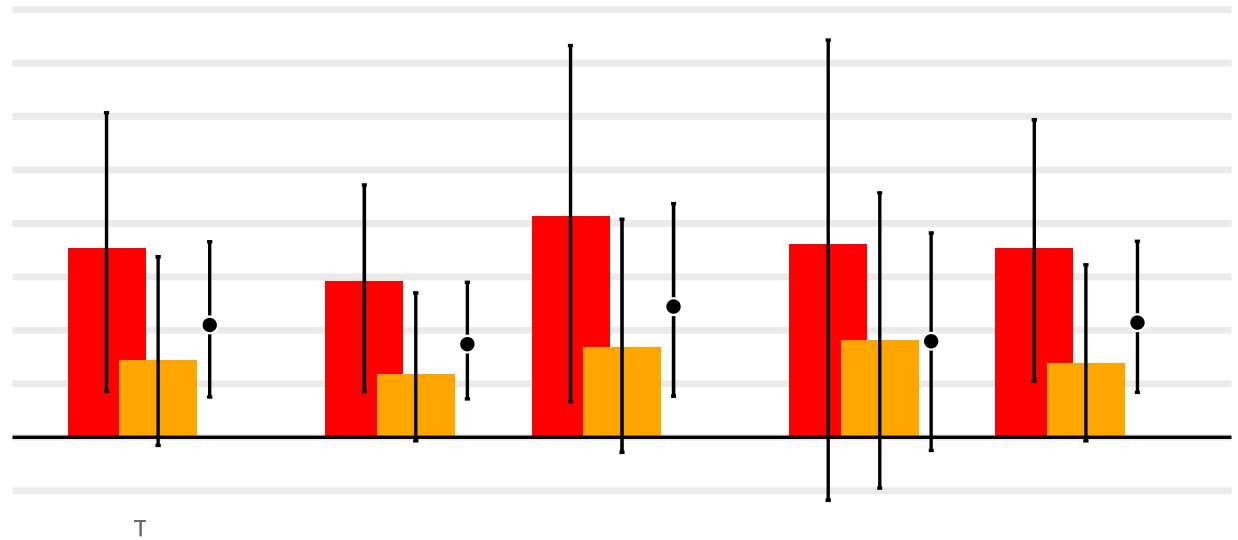
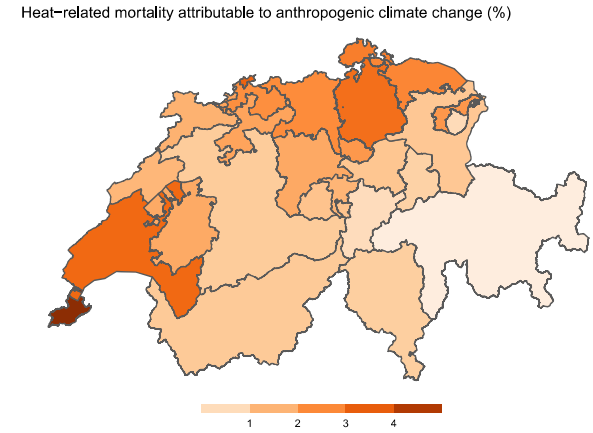
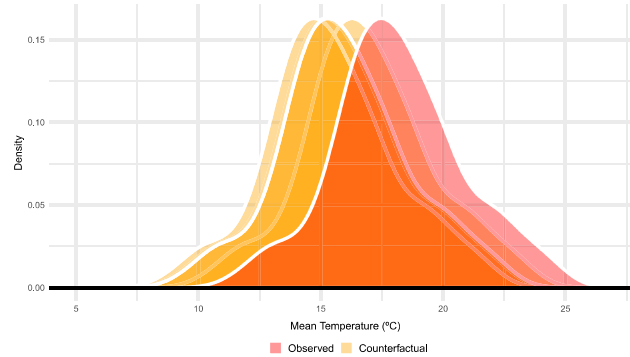


Steps in attributing heatwave-related mortality to climate change: 2009 Victorian heatwave

Kirkpatrick et al. 2025

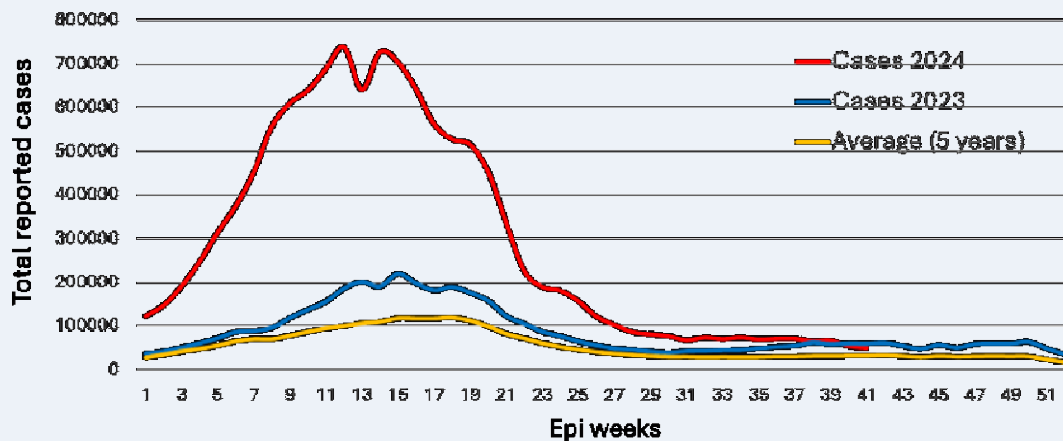


Footprint of anthropogenic climate change on heat-related deaths in summer 2022 in Switzerland
(A) Probability distribution of the observed and counterfactual daily mean temperature; **(B) Canton-specific heat-related mortality attributed to climate change, expressed as mortality fraction;** **(C) heat-related mortality expressed as fraction in observed and counterfactual scenarios**

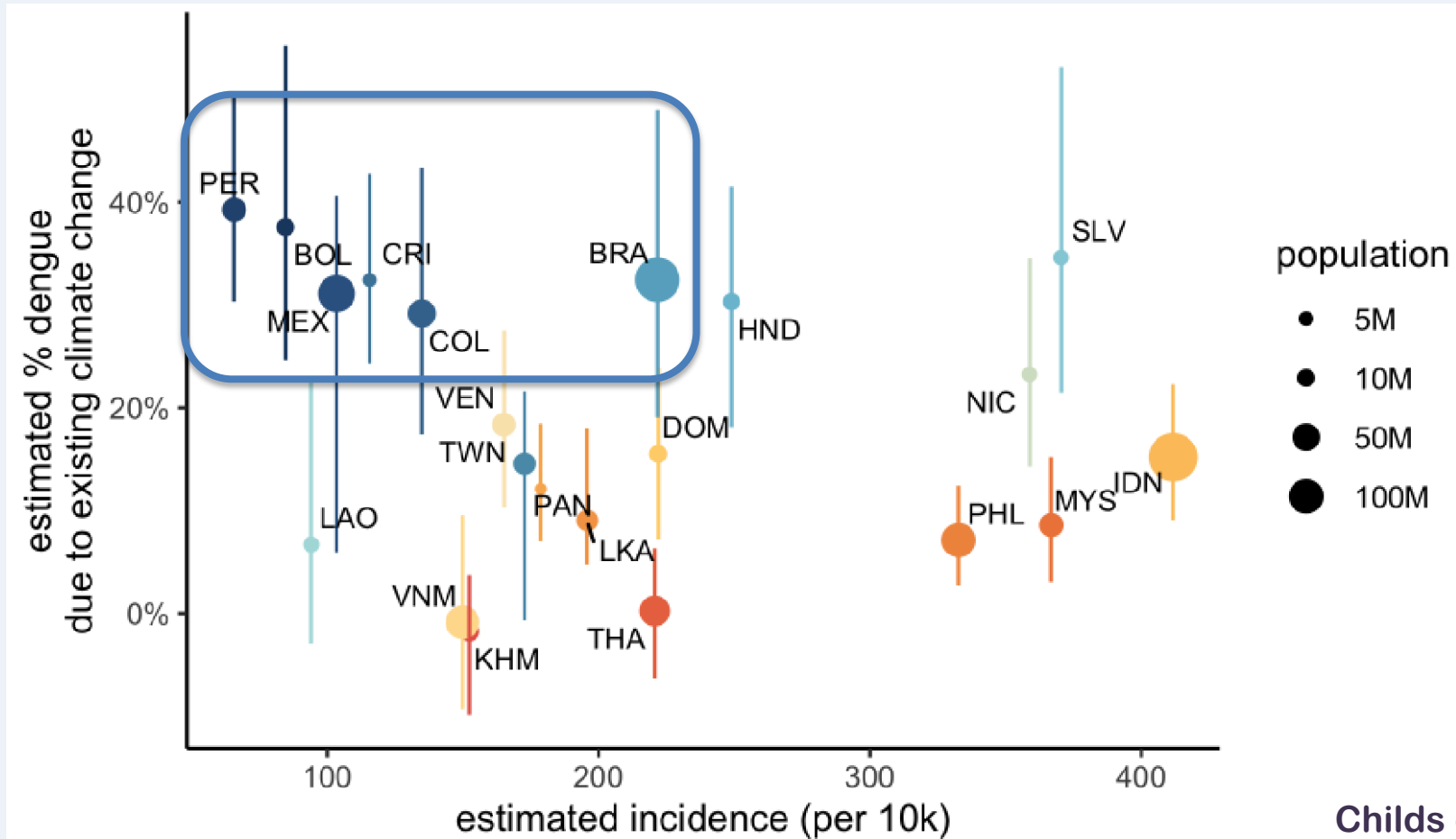


Dengue situation Americas, as of 31 October 2024

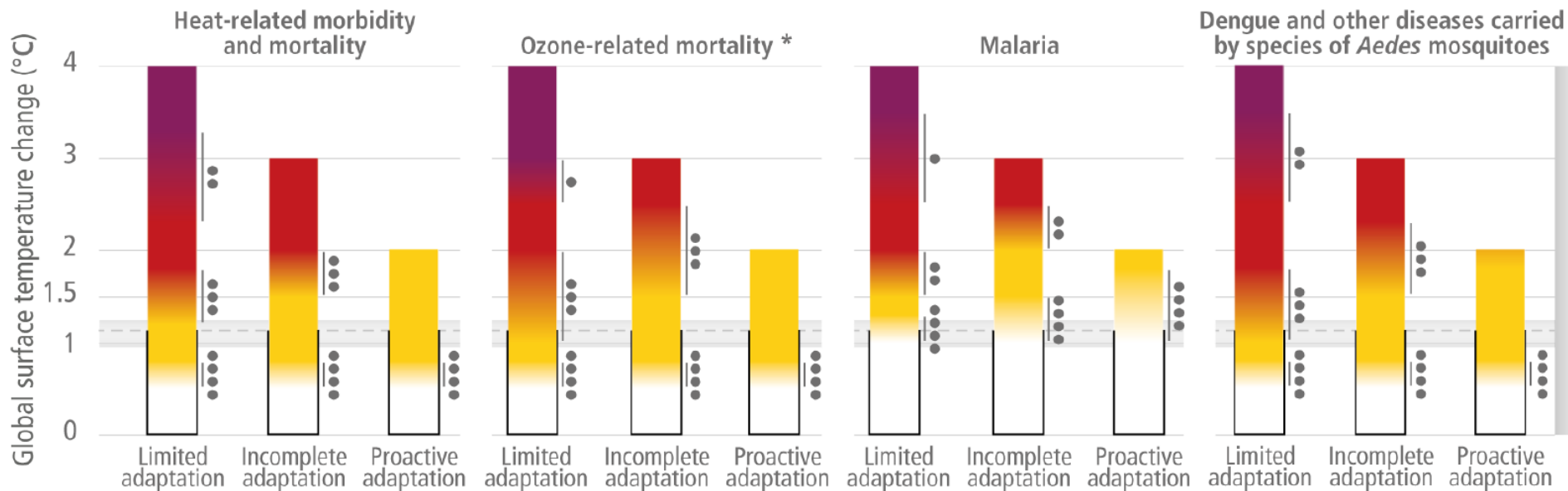
- Total of >12.2 million suspected cases
 - 209% increase compared to the same period in 2023
 - Annual high of 4.6 million cases in 2023 was a record
 - In Feb, the forecast for Brazil was 4 million cases
 - 387% increase compared to the average of the previous 5 years
 - 7,292 deaths
 - States of emergency in Honduras, Peru, and >17 Brazilian cities



Estimated % of dengue due to existing climate change in the Americas & Asia



(e) Climate sensitive health outcomes under three adaptation scenarios



* Mortality projections include demographic trends but do not include future efforts to improve air quality that reduce ozone concentrations.

Scenario narratives

Limited adaptation:

Failure to proactively adapt; low investment in health systems

Incomplete adaptation:

Incomplete adaptation planning; moderate investment in health systems

Proactive adaptation:

Proactive adaptive management; higher investment in health systems

