



National Institute for Public Health
and the Environment
Ministry of Health, Welfare and Sport

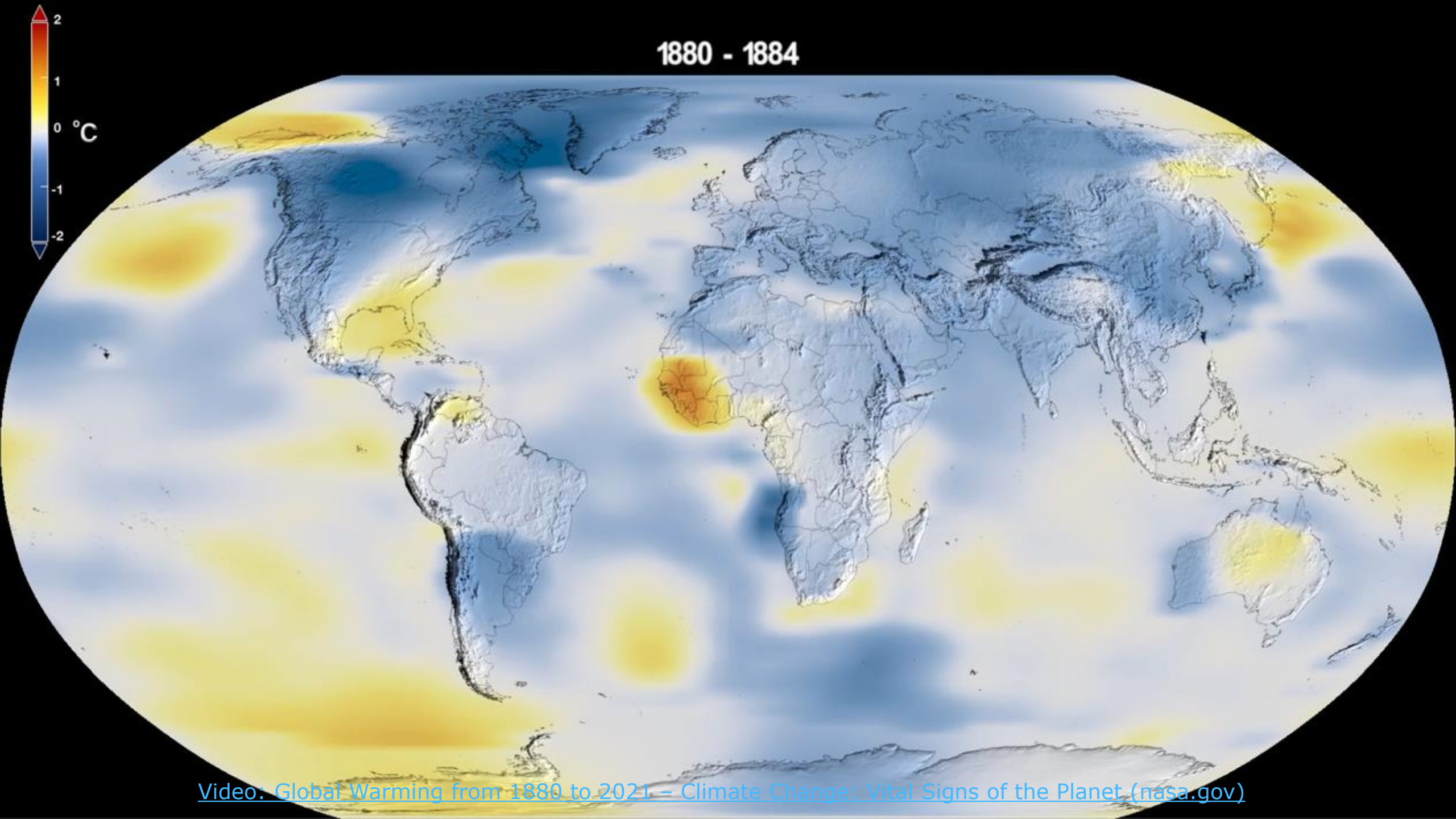
The Climate Crisis: a Health Crisis?

Lisbeth Hall

Centre for Environmental Safety and Security
RIVM

FGÖ-Konferenz: Gesundheit fördern - Klima schützen
21 June 2022

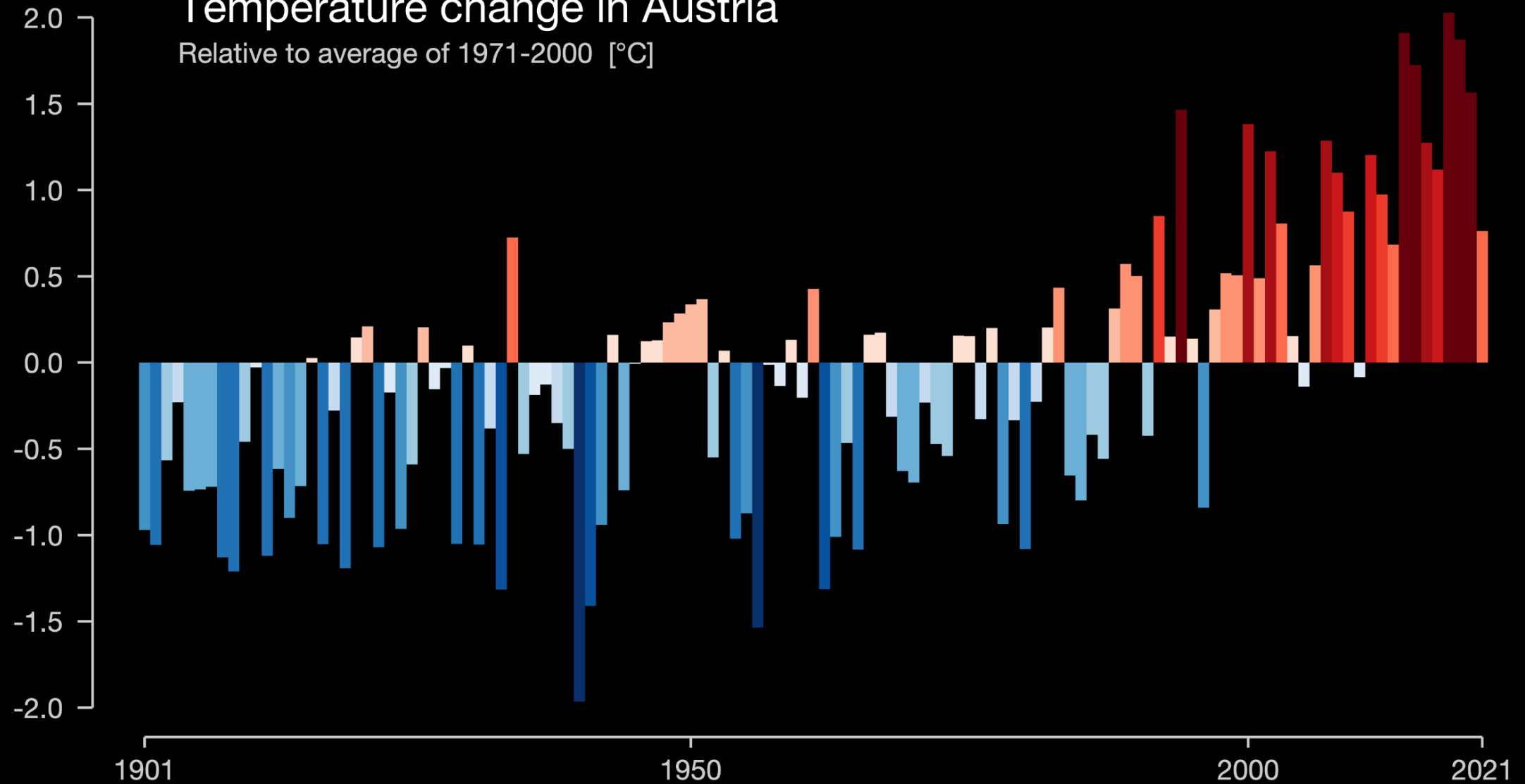
1880 - 1884



[Video: Global Warming from 1880 to 2021 – Climate Change: Vital Signs of the Planet \(nasa.gov\)](#)

Temperature change in Austria

Relative to average of 1971-2000 [°C]



Graphics and lead scientist: [Ed Hawkins](#)

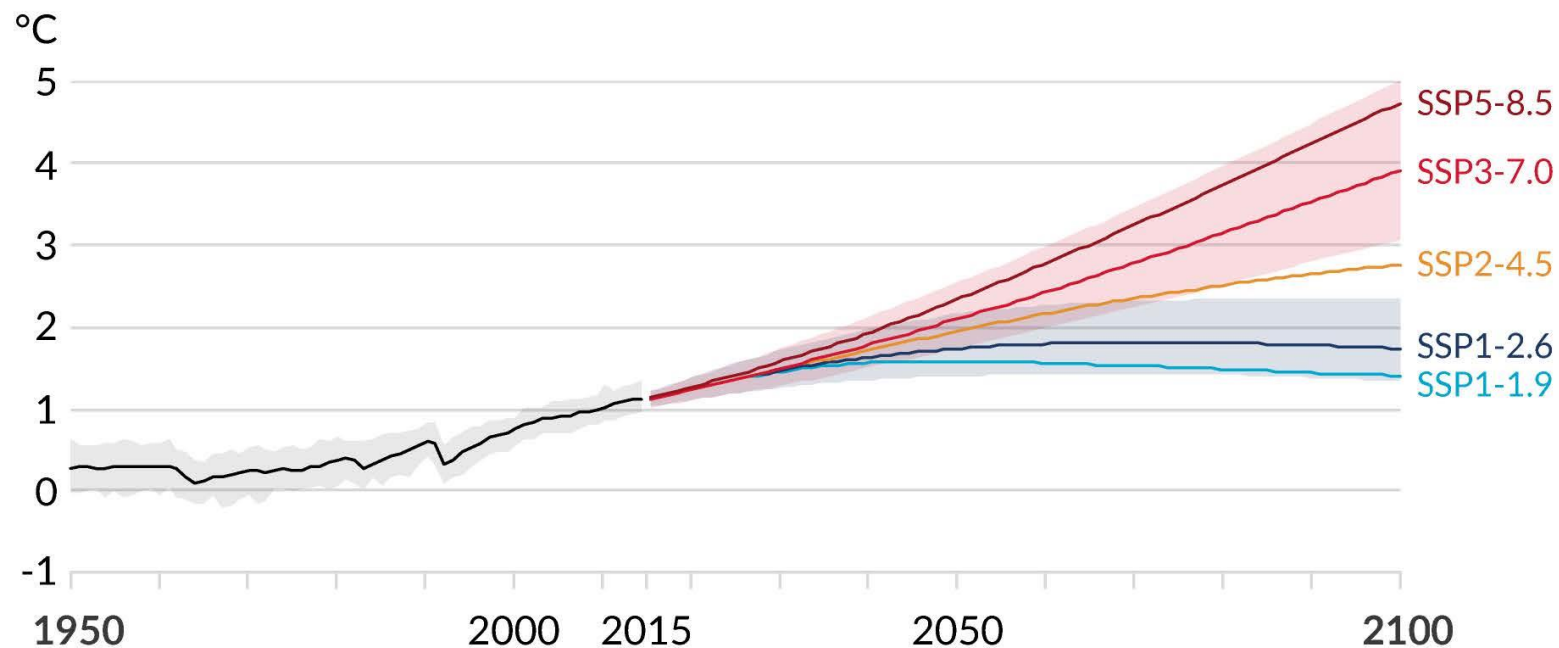
Data: Berkeley Earth, NOAA, UK Met Office, MeteoSwiss, DWD, SMHI, UoR, Meteo France & ZAMG

[#ShowYourStripes](#)



Impacts of anthropogenic climate change: temperature change

a) Global surface temperature change relative to 1850-1900



Human influence has warmed the climate at a rate that is unprecedented in at least the last 2000 years.

IPCC, 2021: Summary for Policymakers

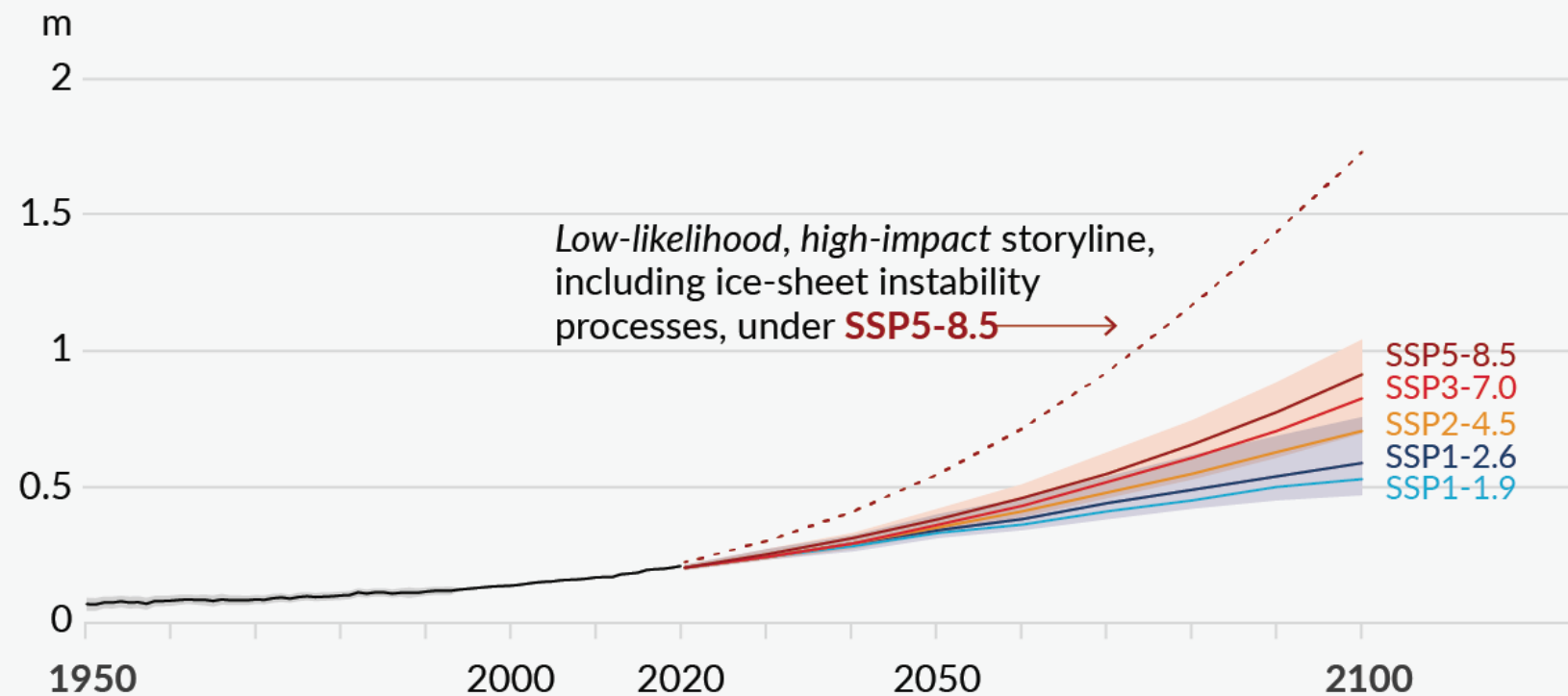
The world faces a 50% chance of warming of 1.5°C above pre-industrial levels, if only briefly, by 2026.

WMO, 9th May 2022

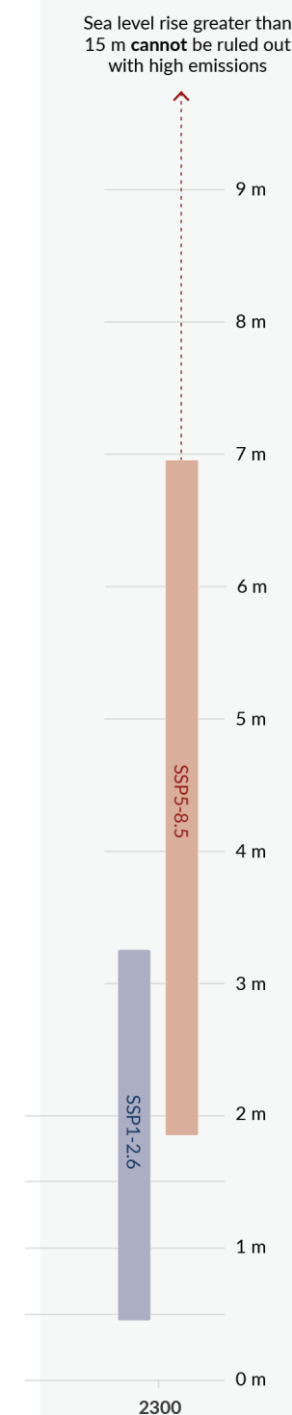


Impacts of anthropogenic climate change: sea level rise

(d) Global mean sea level change relative to 1900

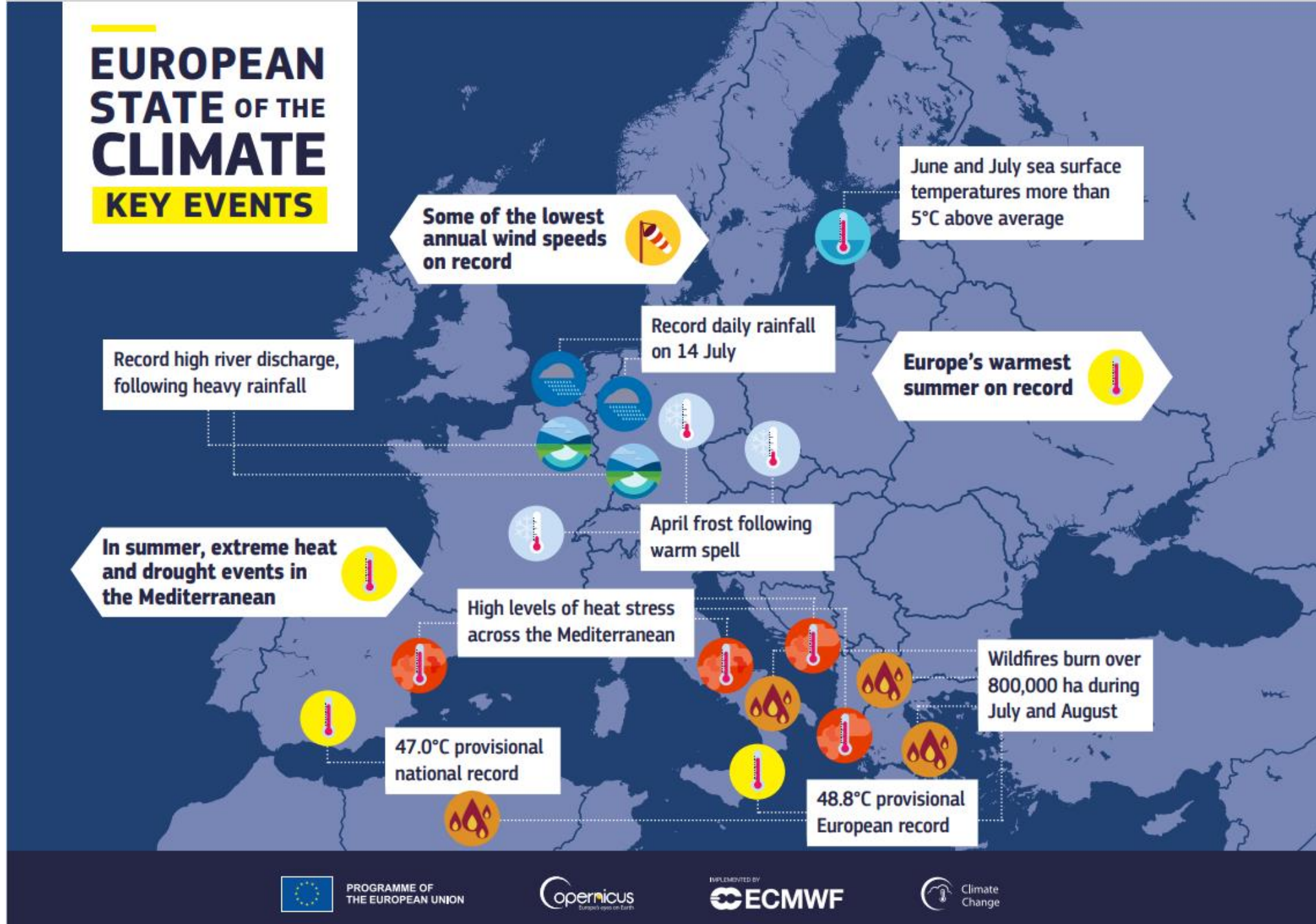


Low-likelihood, high-impact storyline, including ice-sheet instability processes, under **SSP5-8.5**



EUROPEAN STATE OF THE CLIMATE

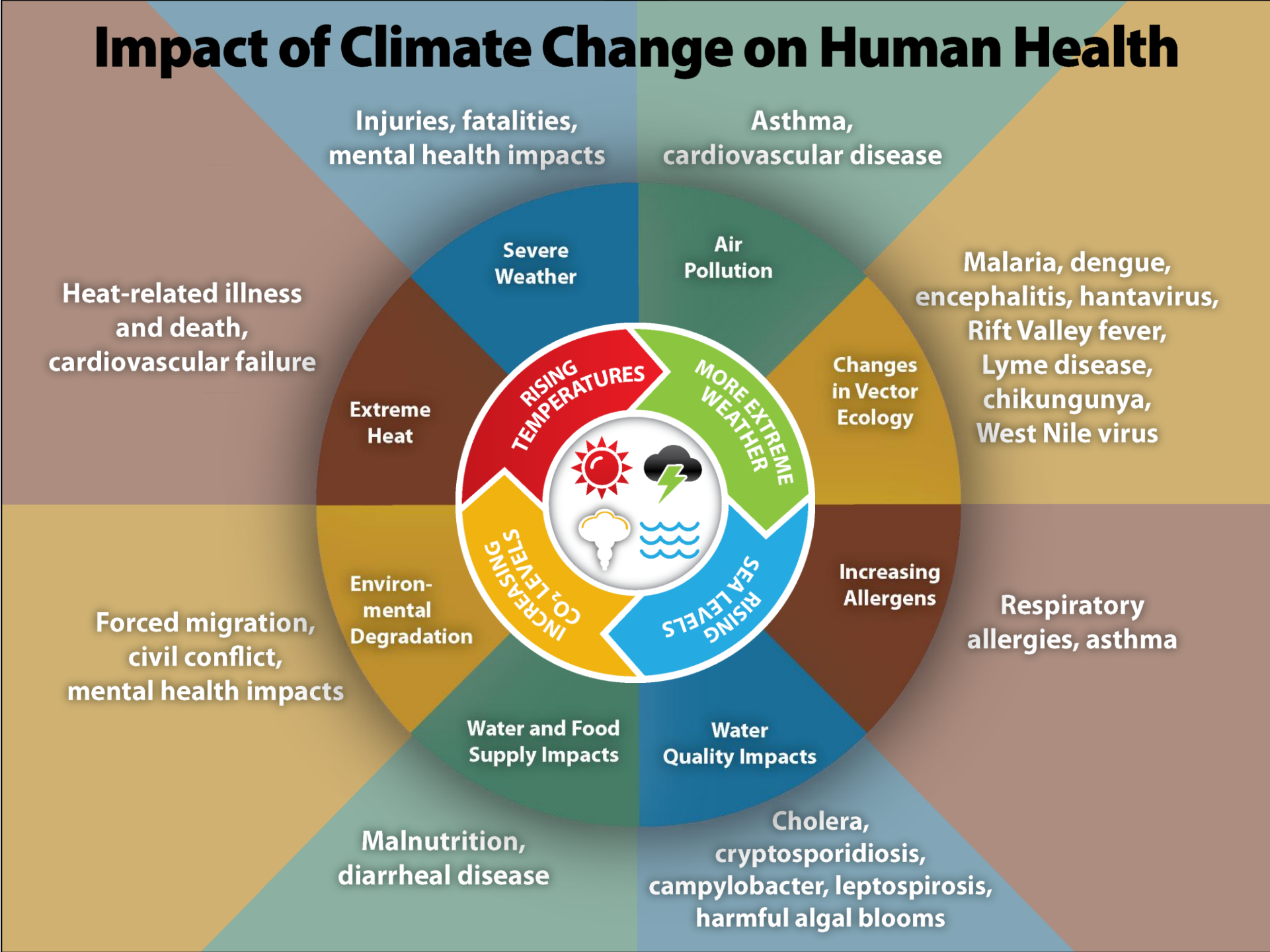
KEY EVENTS



European State of the Climate, 2021

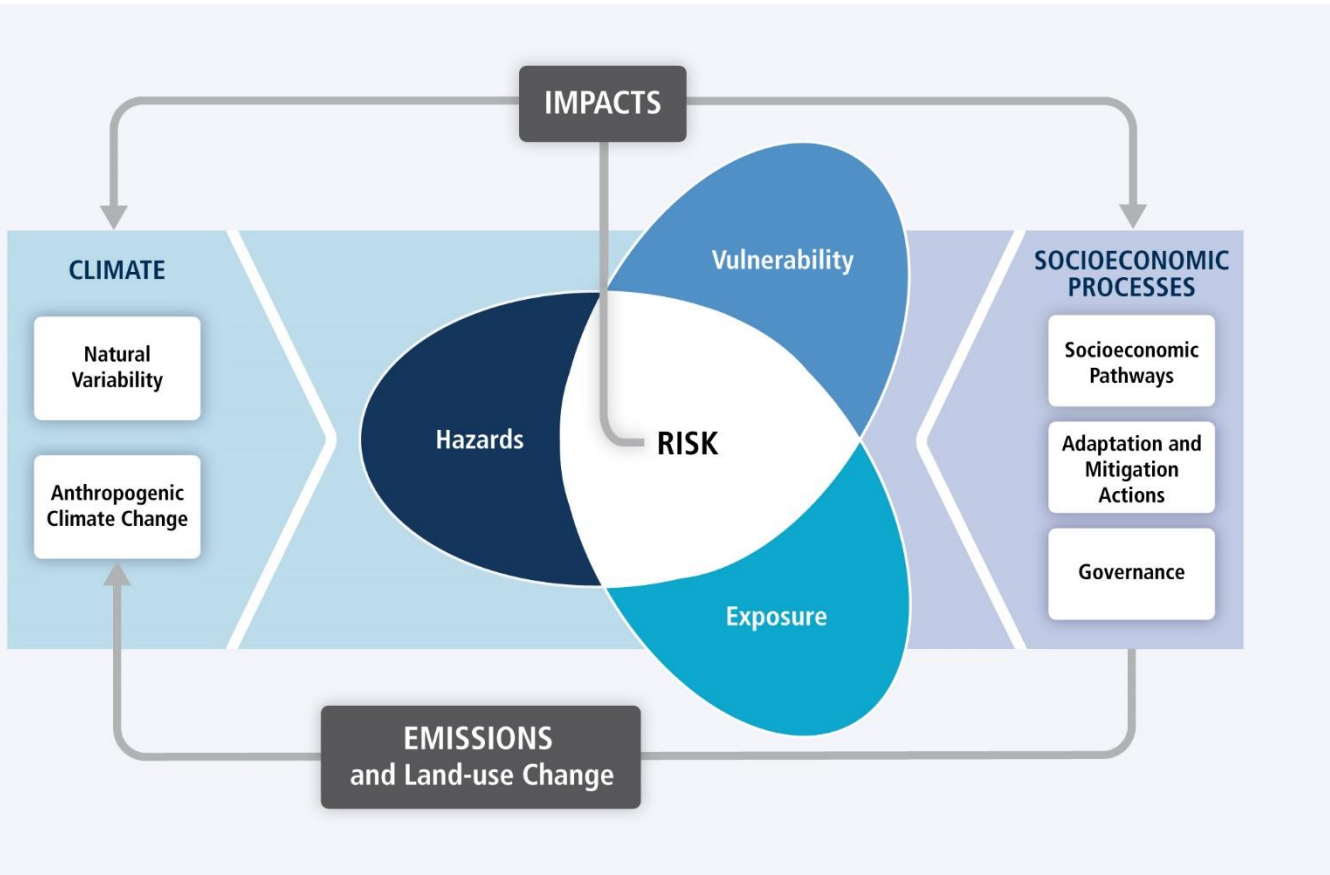
climate.copernicus.eu/sites/default/files/custom-uploads/ESOTC2021/Infographic_keyEvents_final.pdf

Impact of Climate Change on Human Health



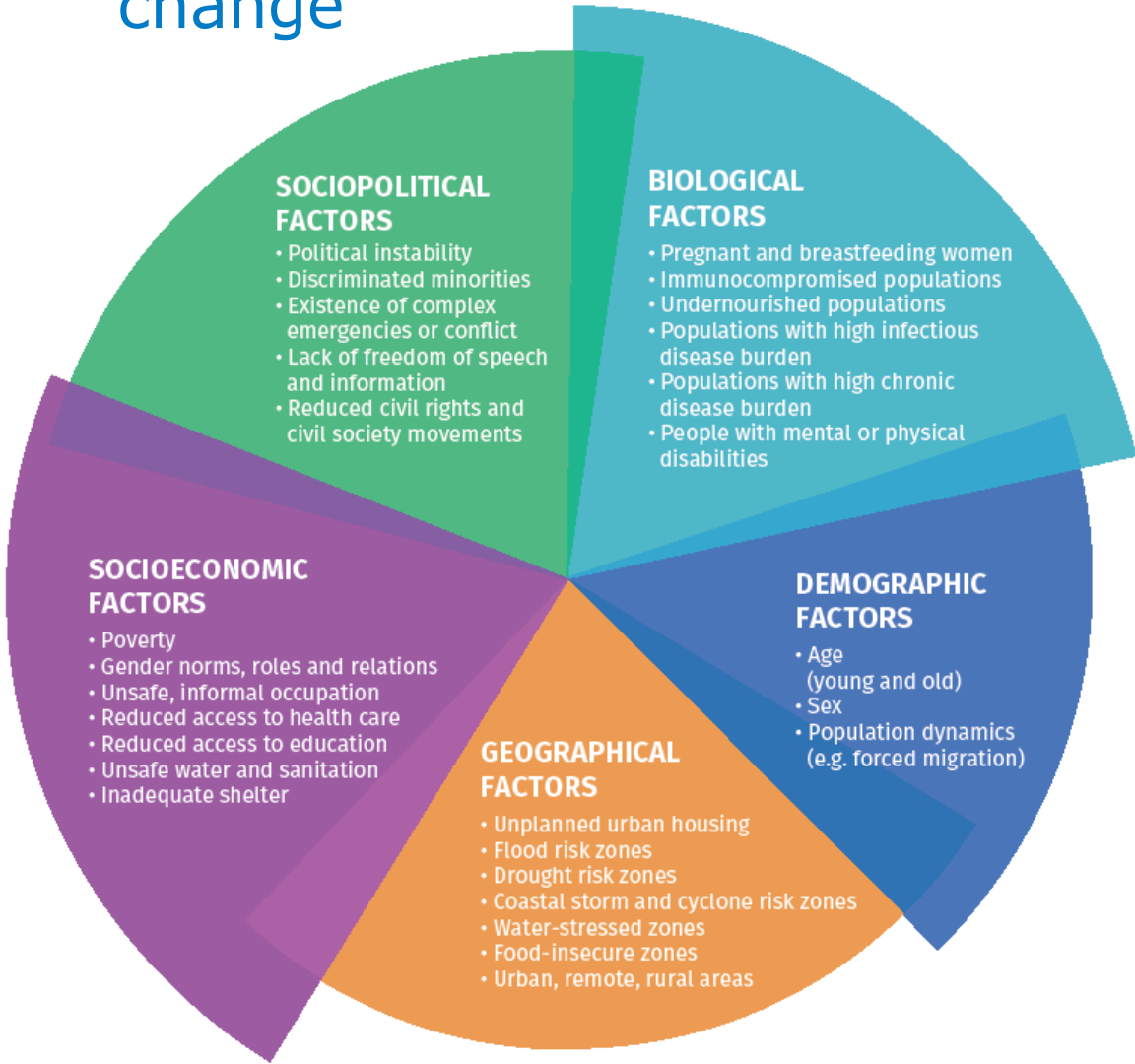
Source: National Center for Environmental Health, CDC.
www.cdc.gov/climateandhealth/effects/

Risk framework



IPCC, 2014: Summary for policymakers. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability

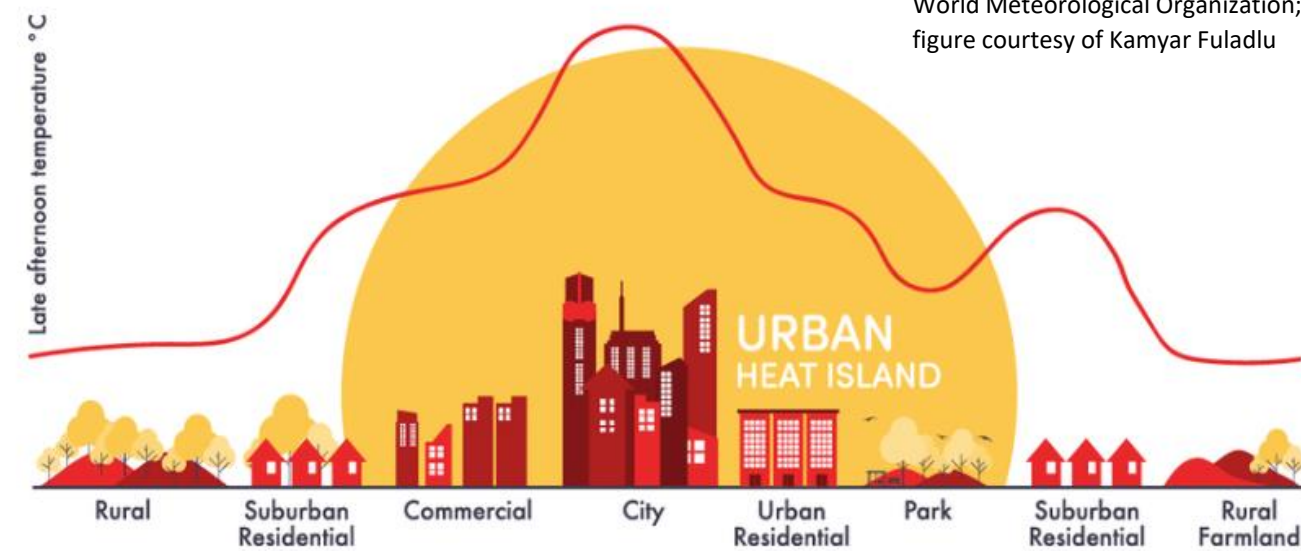
Vulnerability factors for health impacts of climate change



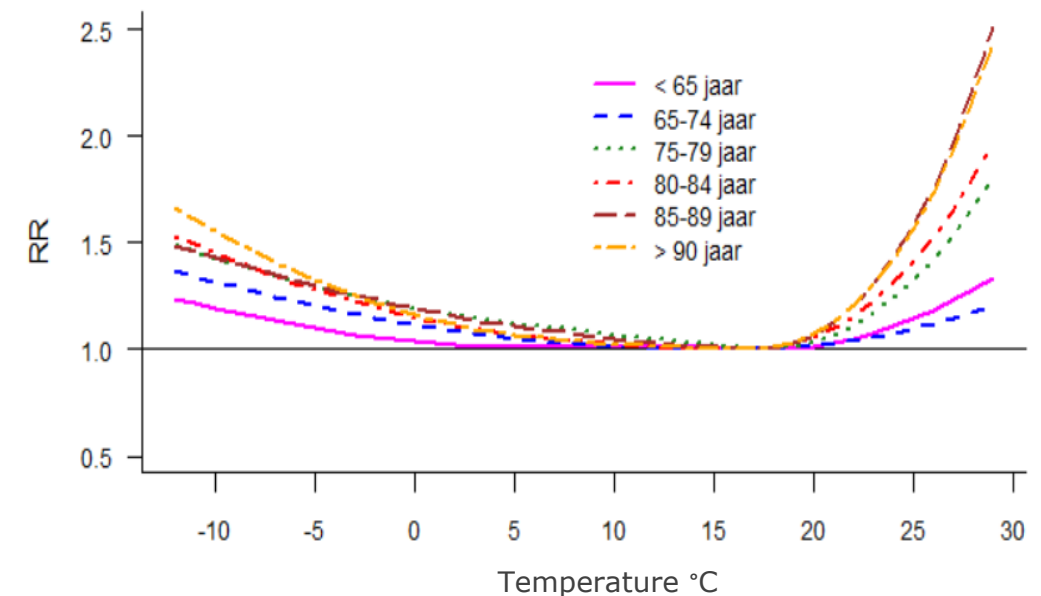
Climate change and health vulnerability and adaptation assessment. Geneva: World Health Organization; 2021.

Heat-related effects of climate change

- More frequent and intense periods of heat
 - Urban heat island effect increases exposure
- Health effects
 - Mortality (cardiovascular and respiratory diseases)
 - Heat stress: problems with sleep, oedema, rash, heat stroke
 - Interaction with air pollution
 - Decrease in concentration & labour productivity
- Vulnerable groups: elderly, very young, people with chronic diseases
- 37% of deaths related to heat exposure around the world between 1991 and 2018 attributed to anthropogenic climate change (Vicedo-Cabrera *et al.*, 2021)



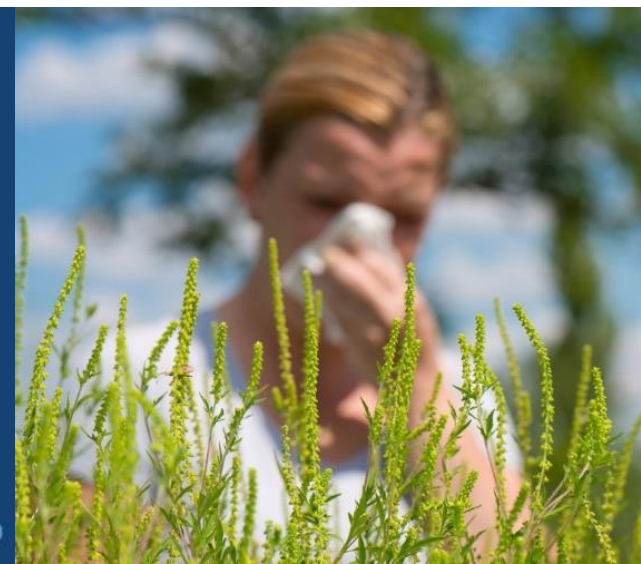
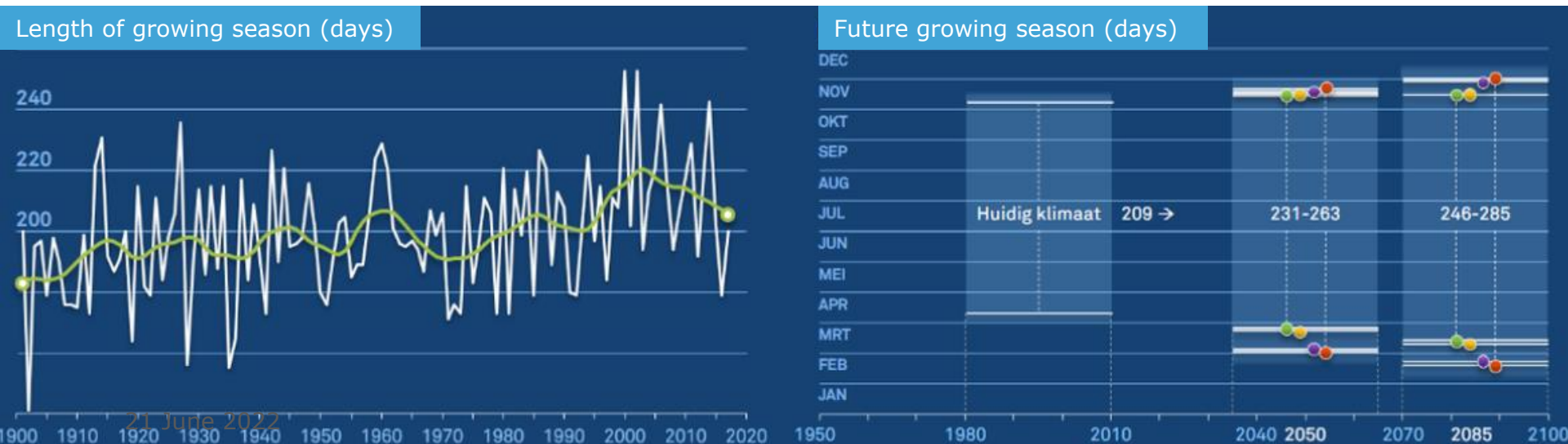
Relative risk of death (RR) at different temperatures and ages in the Netherlands





Pollen allergy & climate change

- Pollen season starts earlier & can be more intense (species dependent)
 - In NL tree pollen season starts and ends earlier and pollen concentrations have increased
 - In NL grass pollen season starts earlier and is longer
- Increase of allergenicity of pollen and pollen production
- Spread of 'new' allergenic species e.g. ragweed (*Ambrosia artemisiifolia*), olive (*Olea europea*)
- More frequent and severe hay fever symptoms
 - Problems with sleep and concentration
 - Increase in GP visits, medication use, sick leave and loss of productivity



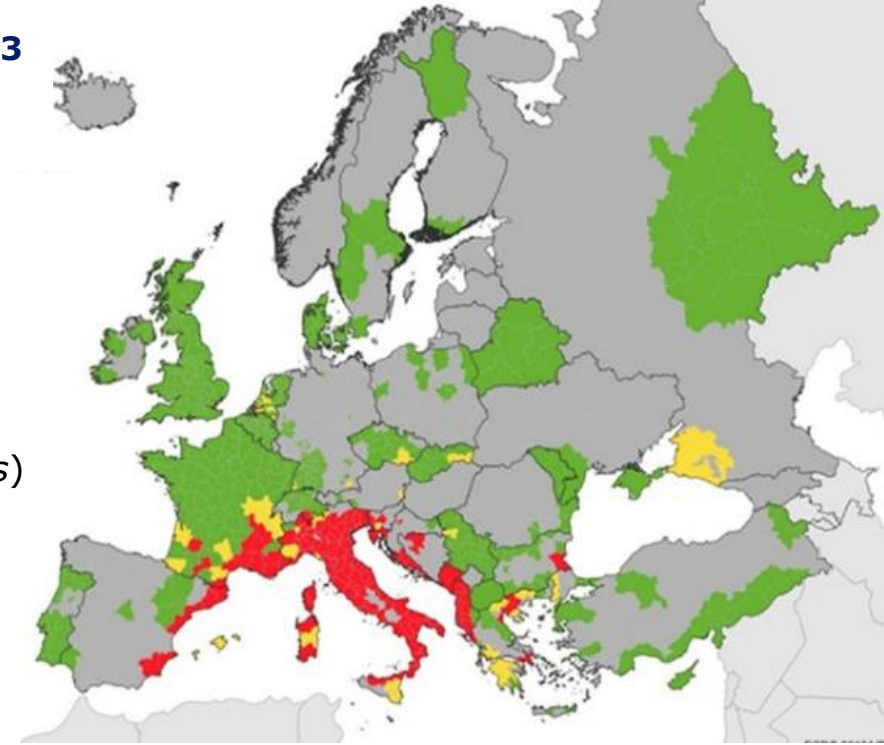


March 2013

Vector-borne infectious diseases

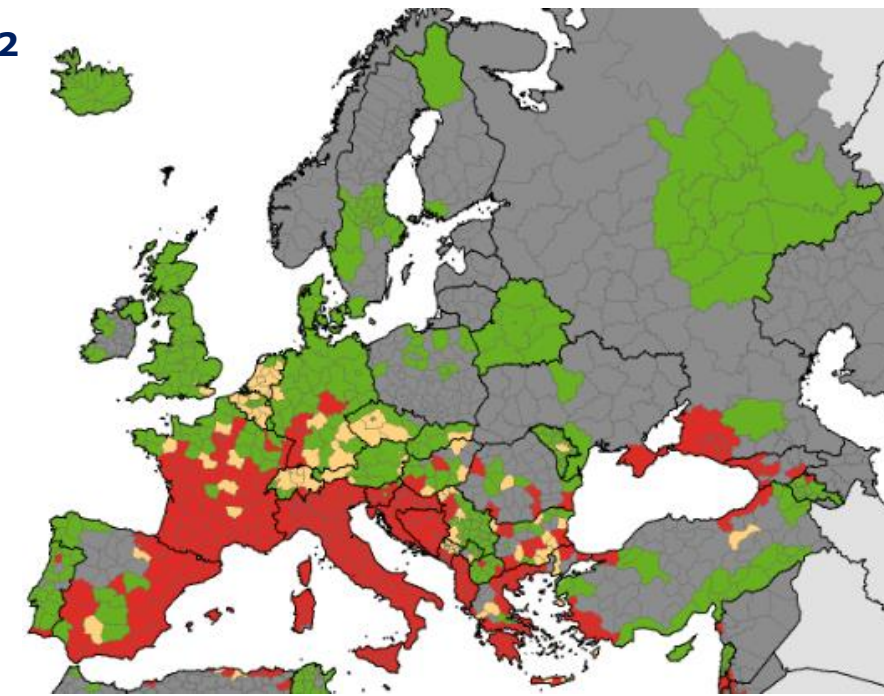
- Climate more favourable for (new) species of mosquito and ticks, e.g. Asian Tiger mosquito
- Increased climate suitability for transmission of infectious diseases e.g. West Nile fever
- Important factors besides climate:
 - Land use, mobility, behaviour, wildlife, surveillance, vector control

Distribution of Asian Tiger mosquito (*Aedes albopictus*)
[Mosquito maps \(europa.eu\)](http://mosquito.maps.europa.eu)



March 2022

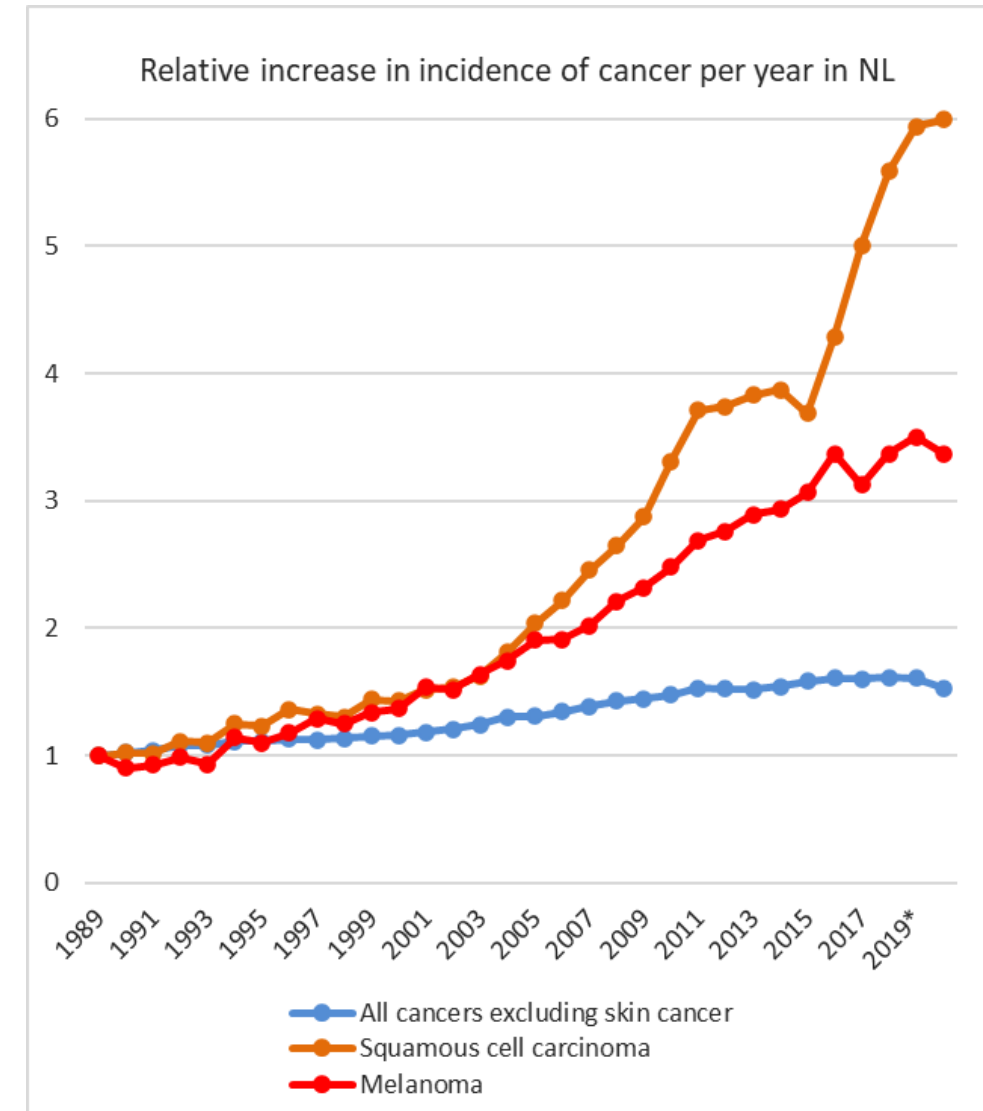
red: established
yellow: introduced
green = not present
grey = no data





UV radiation & climate change

- Less cloud cover
 - More UV radiation
- More days with warm, sunny weather
 - More exposure to UV radiation (behaviour)
 - More skin cancer





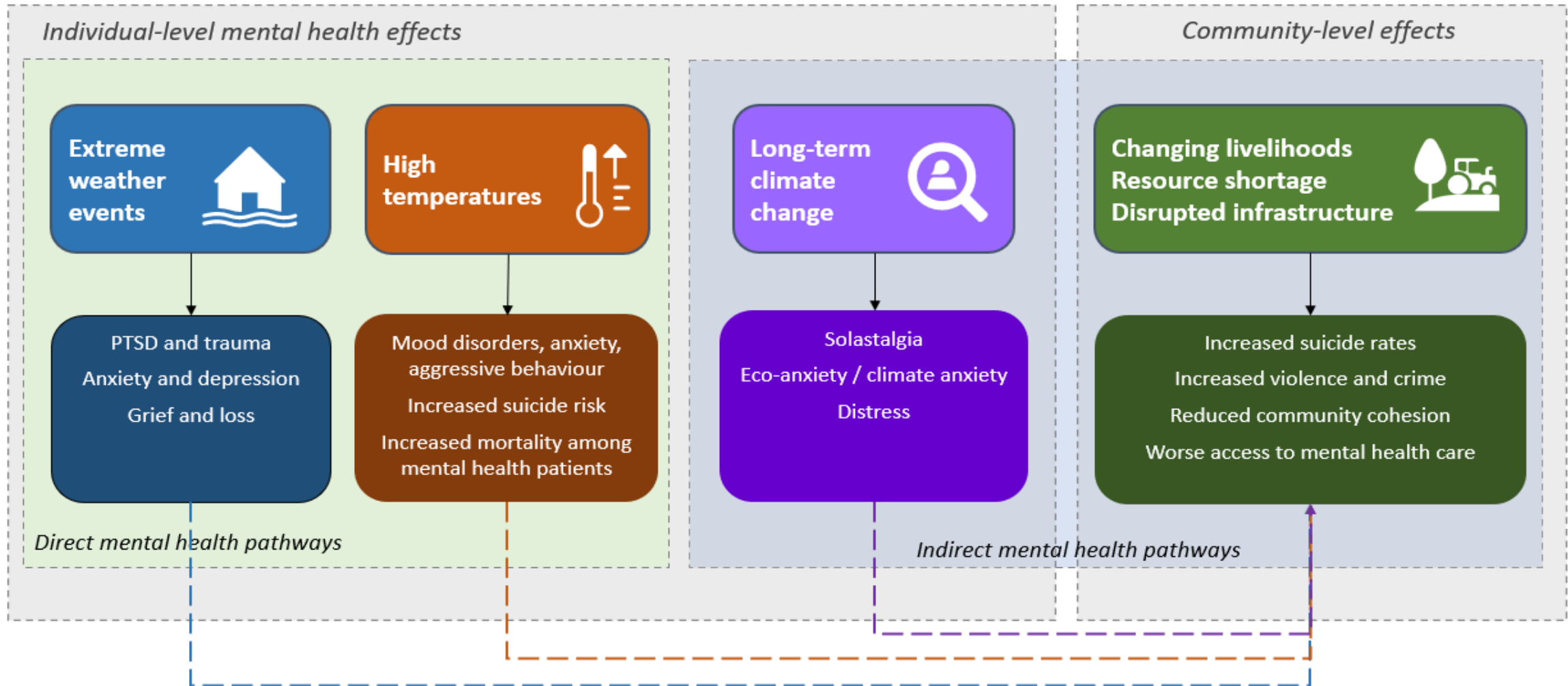
Health effects extreme weather events

- Intense precipitation → sewage overflow
 - Pathogens in flood water
 - Increase in gastrointestinal and respiratory infections
- Higher temperatures and more nutrients in water in dry periods → blue-green algae (cyanobacteria)
 - Skin rashes, gastrointestinal complaints
- Wildfires → air pollution
 - respiratory and cardiovascular effects
- Mental health problems





Impacts on mental health



From EEA 2022, *Climate change impacts on mental health in Europe*. Source: EEA own elaboration, based on Lawrance et al. (2021) and Berry et al. (2010)



Time for some Good News!





Health co-benefits of climate mitigation measures

- ✓ Decreasing use of fossil fuels → reduces air pollution
 - Reduced respiratory and cardiovascular disease
- ✓ More active travel e.g. cycling instead of driving the car
 - More physical exercise
- ✓ Eating less (red) meat
 - Healthier diets
- ✓ Health co-benefits of Dutch mitigation measures in 2050 = 14,000 – 20,500 fewer DALYs/year

- !! Biomass burning can negatively affect air quality
- !! When improving insulation of buildings, ensure good ventilation options
- !! Consider possible noise pollution e.g. from heat pumps, wind turbines



This used to be a motorway through the city of Maastricht!



Health co-benefits of climate adaptation measures

Urban greening

- ✓ Trees provide shade and reduce heat stress
 - ✓ Positive impacts on mental health
 - ✓ Promotes physical activity and social contacts
- !! Consider accessibility, maintenance, safety and space to meet
- the poorest neighbourhoods are often the warmest neighbourhoods!
- !! Avoid plants with strongly allergenic pollen e.g. birch
- !! Consider effects on insect populations e.g. ticks

Integrated approach is important





What have we learnt?

- Climate change is already having an impact on health; effects will increase in the future
- The climate crisis is a health crisis, especially for vulnerable populations
- Important to present the health argument for mitigation and adaptation measures
 - Maximise the co-benefits
 - Keep an eye on possible negative effects
- When developing & implementing measures
 - An integrated and intersectoral approach is essential
 - Include the health perspective from the start



An aerial photograph of a river winding through green fields at sunset. The sun is low on the horizon, casting a warm orange glow over the landscape. The river flows from the left towards the right, with a small house visible on the left bank.

Thank you for your attention!

www.rivm.nl/en/climate-change-and-health

lisbeth.hall@rivm.nl