

Training for public health professionals



Climate-TRAP

Module – heat waves

Training objective

- To learn how to be prepared for changes in public health due to climate change
- Take home message
 - Health impact
 - Mitigation and adaptation
 - Preventive measures on individual & community level

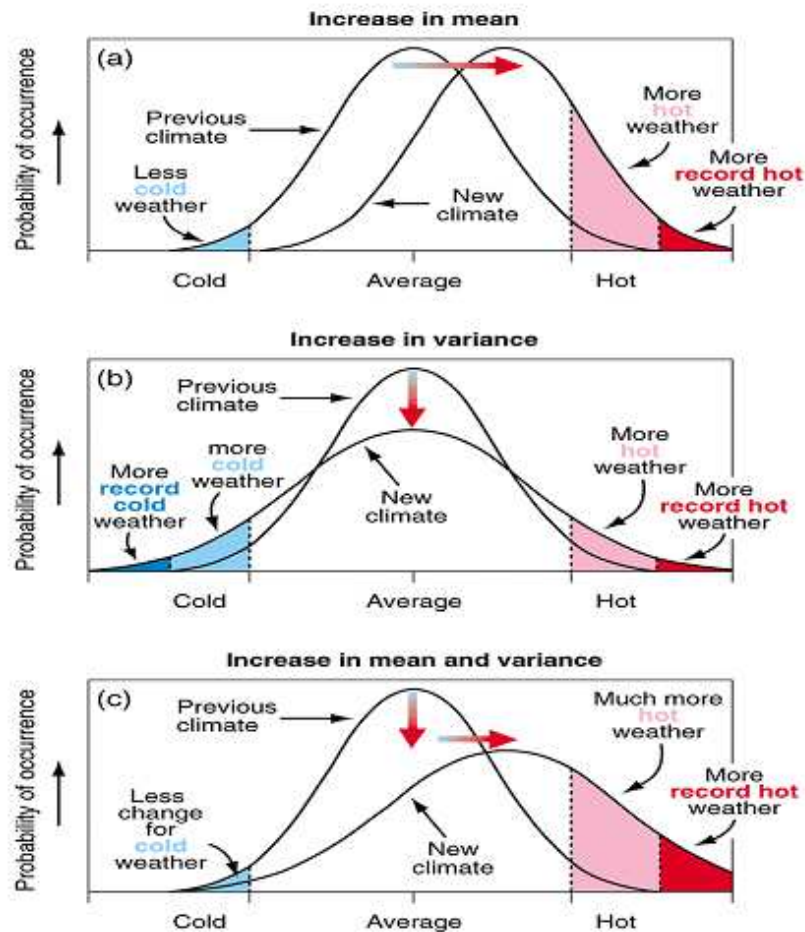
Definitions

- **Mitigation** = reducing the severity of climate change (reducing greenhouse gas concentrations)
- **Adaptation** = preparing for change (adjusting our systems to reduce harm from climate effects)

Module heat waves

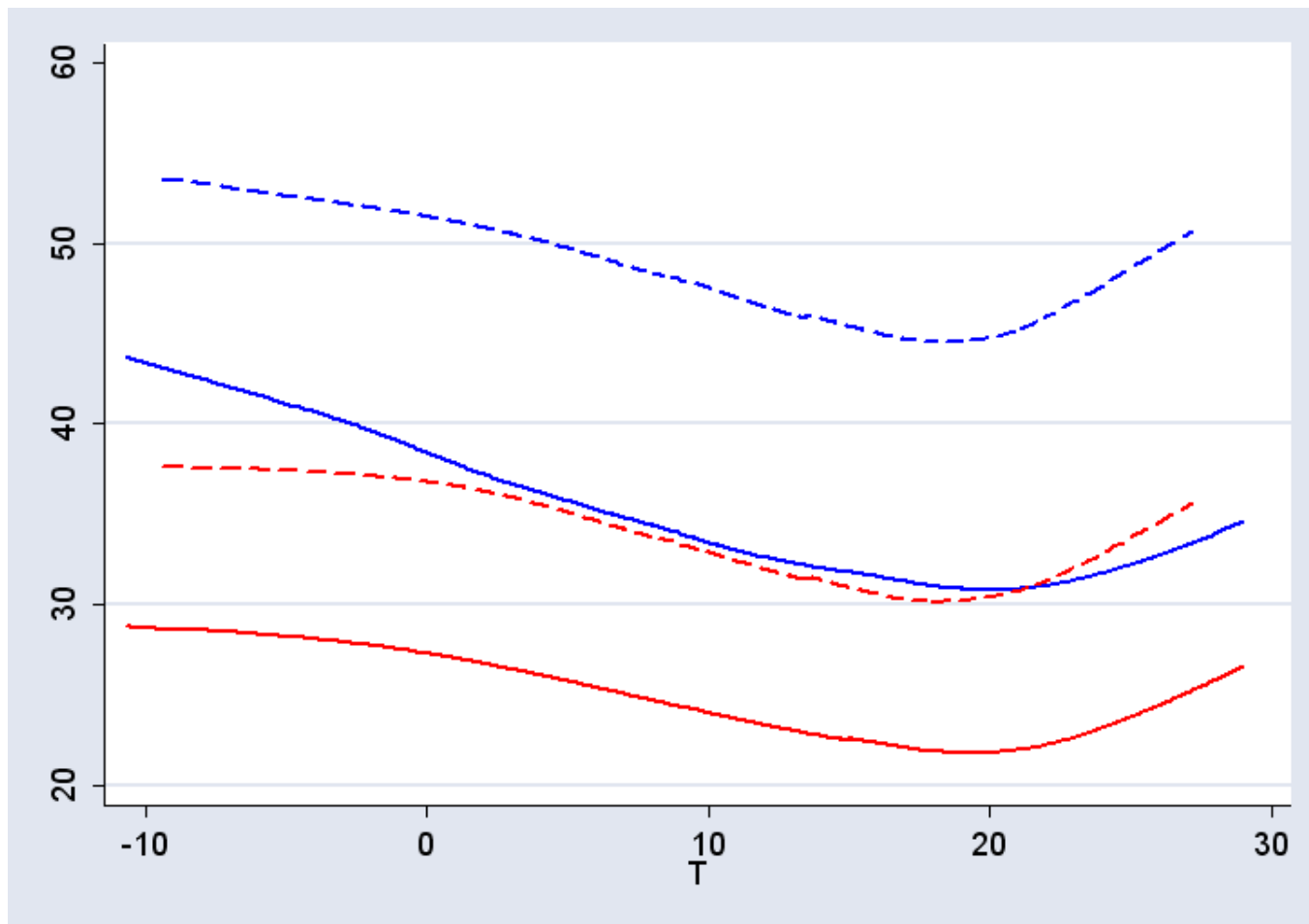
- Weather and climate
 - Different temporal scales
 - Hours (minutes) to days/weeks/...
 - Decades
- Warming climate → hotter weather?
 - Time series data on the impact of day-to-day variability of temperature (“weather”)
 - Relevance for CC impact?

Climate change and temperature



- Increase in
 - Mean temperature
 - Variability
- Adaptation to variability:
 - Institutional
 - Not physiological

Daily deaths in Vienna



Male / Female

1975-1979 -----

1999-2003 _____

LOWESS
Max Temp (°C)
(same day)

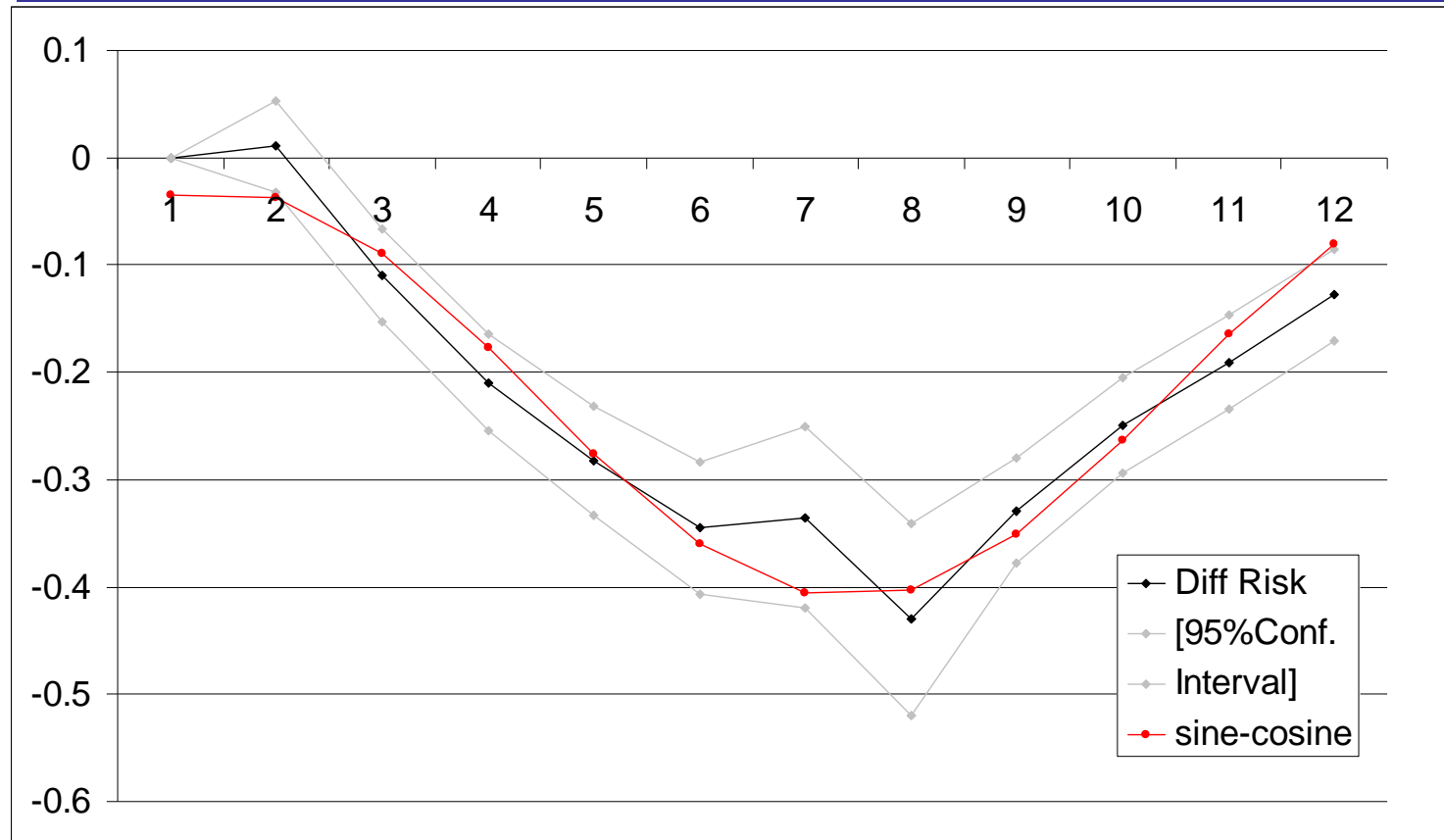
Impact on public health

- *PHEWE study:*
- *Per 1°C increase of daily temperature above city-specific threshold*

$$\Delta Y = (Y_o \times pop) \times (e^{\beta \times X} - 1)$$

- *(Total non-traumatic) mortality*
 - *RR = 1.020 (1.00 – 1.055)*
- *Respiratory hospitalisation, age >75*
 - *RR = 1.040 (1.031 – 1.045)*

Seasonal effects

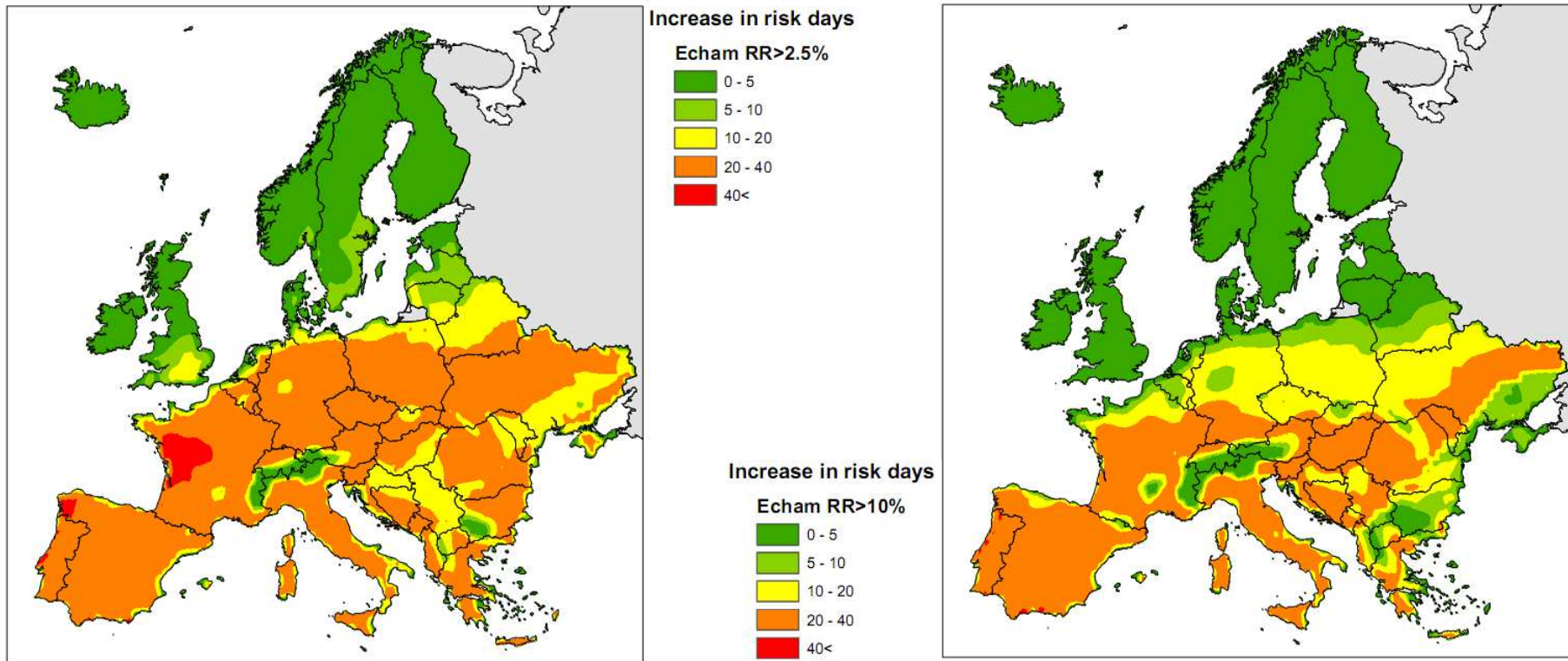


Month
(Jan-Dec)

Example Vienna: % difference from daily mortality in January;
Females > 65; 1975-1979 & 1999-2003.

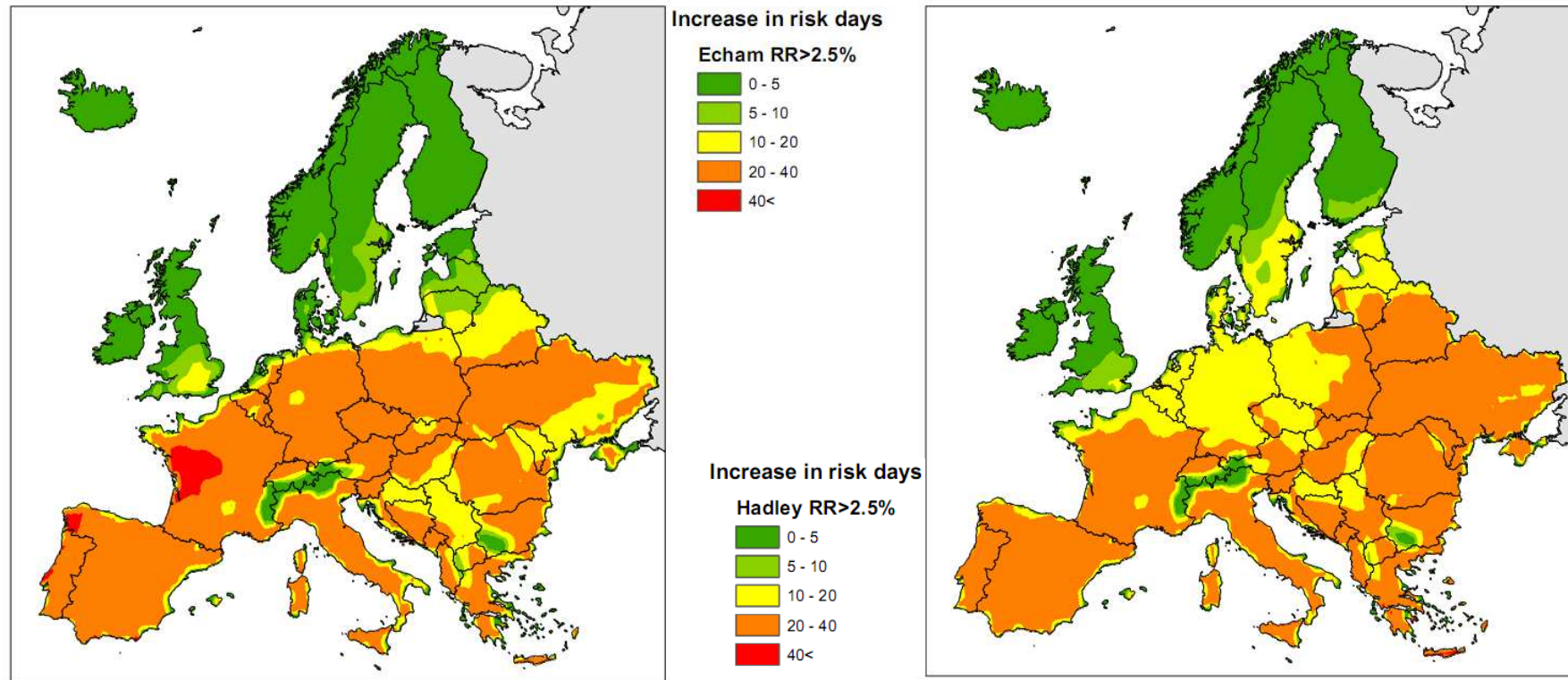
Here we only discuss summer mortality!

Impact assessment I



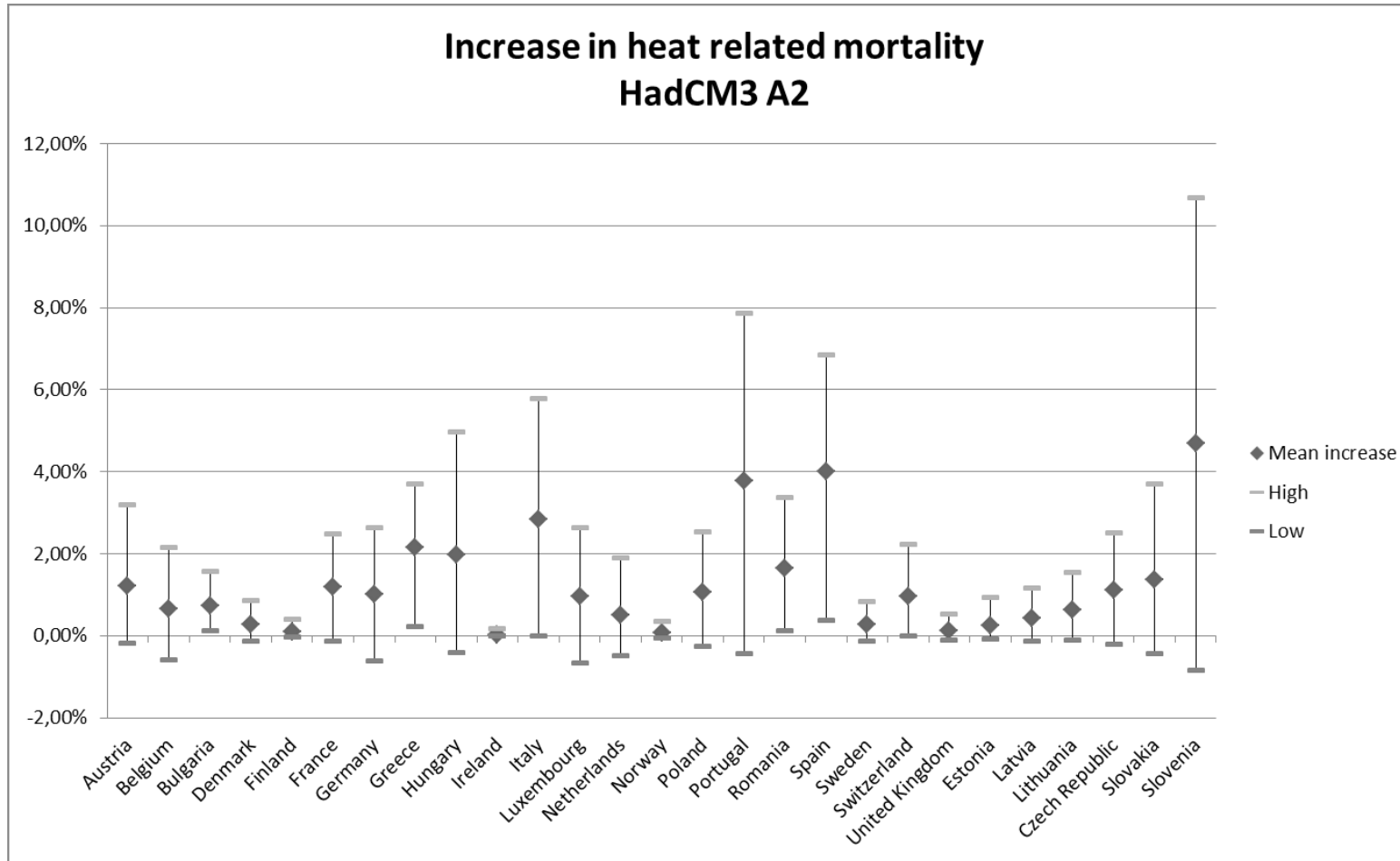
Number of days with [RR]-fold increase in number of daily deaths due to heat

Impact depends on model



Echam: MATCH-RCA3-ECHAM4 climate model (based on the A1B SRES scenario)
Hadley: MATCH-RCA3-HADLEY model (based on the A2 SRES scenario)

Estimates per country



Impact: Mortality (% increase)

Scenario	A1B	A2
2035	Echam4	HadCM3
Austria	1.18	1.22
France	1.34	1.19
FRG	0.98	1.02
Italy	2.25	2.84
NL	0.39	0.51
Sweden	0.10	0.27
(...)		
EU	1.25	1.43



Impact: Hospitalisation

Scenario	A1B	A2
2035	Echam4	HadCM3
Austria	0.29	0.27
France	0.54	0.33
FRG	0.32	0.26
Italy	0.65	0.71
NL	0.34	0.21
Sweden	0.14	0.17
(...)		
EU	0.55	0.58



Summary / Warning systems

- Impact of meteorological model
- Overall increase in cases, but
 - Variation by geographic area
 - Shift in seasonality of mortality (and morbidity)
- Already now severe health effects
- Forecasting & warning messages
- Individual behaviour can be protective

What actions are needed?

- Mitigation
 - Reduce air pollution
 - Precursor gases!
- Adaptation
 - Prevention of adverse effects
 - Treatment / public health care
 - Implementation of warning systems

Prevention

- Individual level
 - Average person: advise to avoid exercise on hot days
 - Susceptible person: advise to reduce physical activity, consume light food, sufficient beverages
- Community level
 - Issue warning messages and information
 - Care for persons at risk (old, alone, diseased)

Public health care

- To disseminate information on climate adaptation management to all involved **sectors** (decision/policy makers on local and (inter-) national level)
- To promote the training of professionals in the public health sector (GP's, health care workers, emergency doctors, etc.)

Implement warning systems

- Use/implement warning systems
- Create “plan of action” for big events (for example, motor race or outdoor concert)

More information

Other climate-TRAP training modules

- Ozone/Air pollution
- Allergens
- Flooding
- Food-born disease
- Water-born disease
- Vector-born disease
- *Other*

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