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EUROPEAN ENVIRONMENT AND HEALTH PROCESS

Workshop on the development of climate information systems for heat–health early warning

Assessing knowledge, needs and the path forward

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Outline

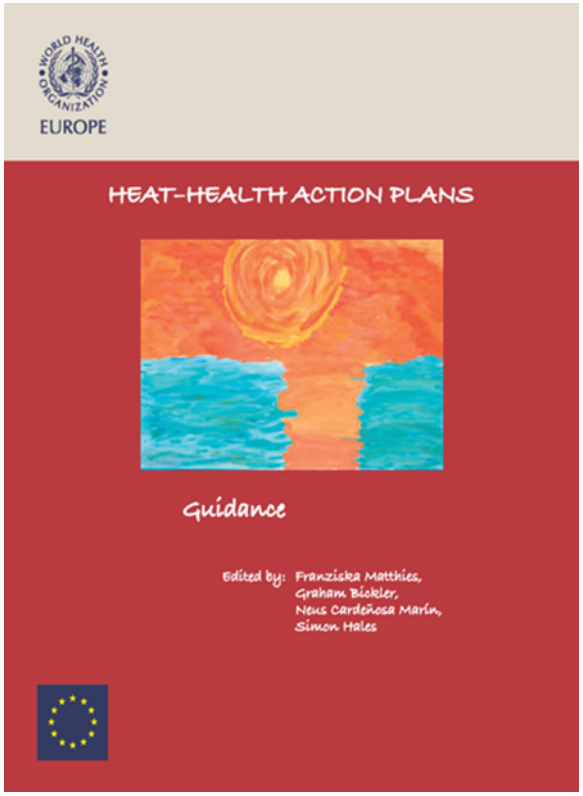
Heat–Health Action Plans (HHAP)

- Guidance
- Core elements
- Public health messages for heat
- Development and implementation
- Monitoring and evaluation

Tools and country support

Current and future developments

Heat–Health Action Plans Guidance

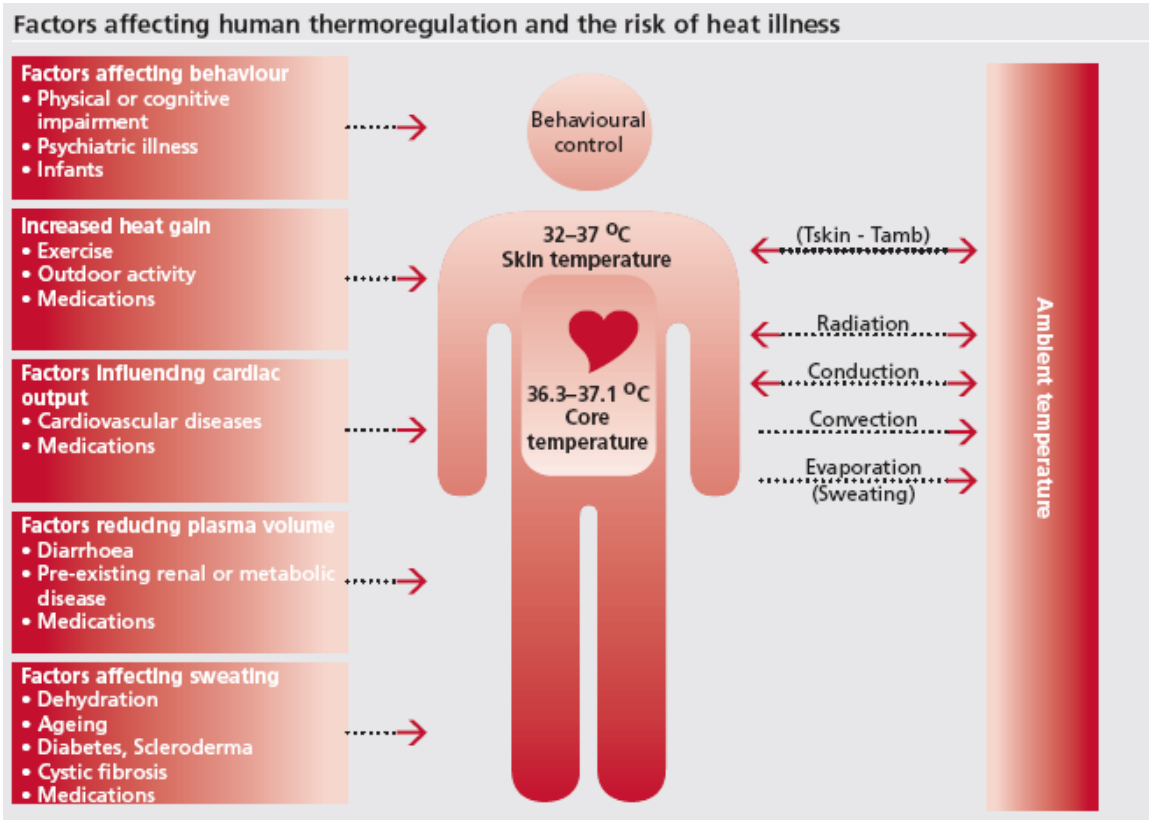


- **Heat and Health:**
  - Short-term relationships between temperatures and health outcomes
  - Vulnerable populations
  - Interaction between heat and pollution
- **Heat–health action plans**
  - General principles
  - Core elements

www.euro.who.int/heat-health-action-plans-guidance

Heat and health

- Short-term relationships between temperatures and health outcomes
- Heat projections
- Vulnerable populations
- Interaction between heat and pollution (including forest fires)



WHO Regional Office for Europe (2008) Heat-Health Action Plans - Guidance

9 Core elements of a HHAP (1–3)

Core element	Sub-elements
1. Agreement on a lead body and clear definition of actors' responsibilities	- clearly defined lead body - involvement of >1 other agencies - regular meetings and/or reviews - inclusion in national disaster preparedness - cross-border cooperation
2. Accurate and timely alert systems, heat–health watch-warning systems	- threshold definition scientifically sound - regionally-adapted definitions - warning is issued well in advance - different alert levels for different levels of action - alert is communicated following a clear plan
3. Health information plan	- clearly defined actors/recipients/contents - effective dissemination of information (>1 channel) - quality of advice - public and professionals addressed - appropriate timing of information campaign

9 Core elements of a HHAP (4–6)

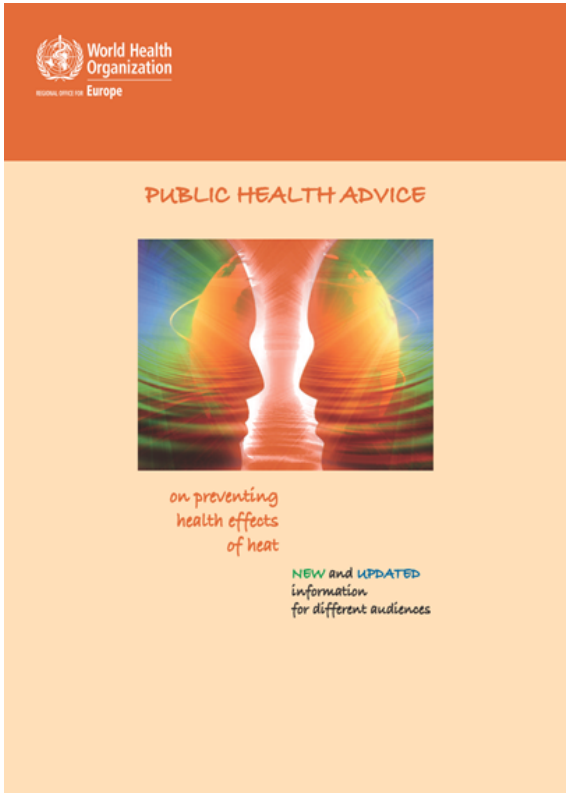
Core element	Sub-elements
4. Reduction in indoor heat exposure	- giving advice - providing cool rooms/spaces - provision or use of mobile coolers - planning or support for increased albedo or shading - planning or support for better insulation
5. Particular care for vulnerable groups	- identification of relevant groups (>1) - activation of a telephone service - specific measures (buddies, neighbours…) - regular re-assessment of vulnerable population groups - information and training for care-givers
6. Preparedness of the health/ social care system	- increase of capacity of health services - heat reduction in healthcare facilities - special precautions in nursing homes - special resources for patients/public - improving health-care networks

9 Core elements of a HHAP (7–9)

Core element	Sub-elements
7. Long-term urban planning	- increased green and blue spaces - changes in building design (albedo, insulation, passive cooling) - changes in land-use decisions - energy consumption reduction - individual and public transport policies
8. Real-time surveillance	- less than 48-hour interval - involving data from >1 region/city - involving data from >1 health effect - use for adjustment of measures - use for evaluation of effectiveness
9. Monitoring and evaluation	- end-of-summer evaluation - monitoring health outcomes

Public health advice for heat-waves

- **Information for different audiences: a series of 15 information sheets targeted to different audiences:**
  - **for the general public,**
  - **for health authorities,**
  - **for medical professionals and care providers,**
  - **for general practitioners (GPs),**
  - **for retirement and care home managers,**
  - **for employers, and**
  - **for city planners.**



www.euro.who.int/public-health-advice-on-heat

Public health messages for heat

- **For the general public** (with practical advice)**:**
  - Keep your home cool
  - Keep out of the heat
  - Keep the body cool and hydrated
  - Help others
  - Seek help if you feel unwell
- **For health authorities and medical professionals**
  - Risk factors: vulnerable populations, medical conditions and medication, socioeconomic and environmental conditions (including air quality)
  - Treatment of heat-related illness
  - Specific information on protecting health from vegetation fires during heat-waves
  - Communicating “heat”

Development and implementation

Heat–health action plans can save lives, but…

How far is development & implementation in Europe?

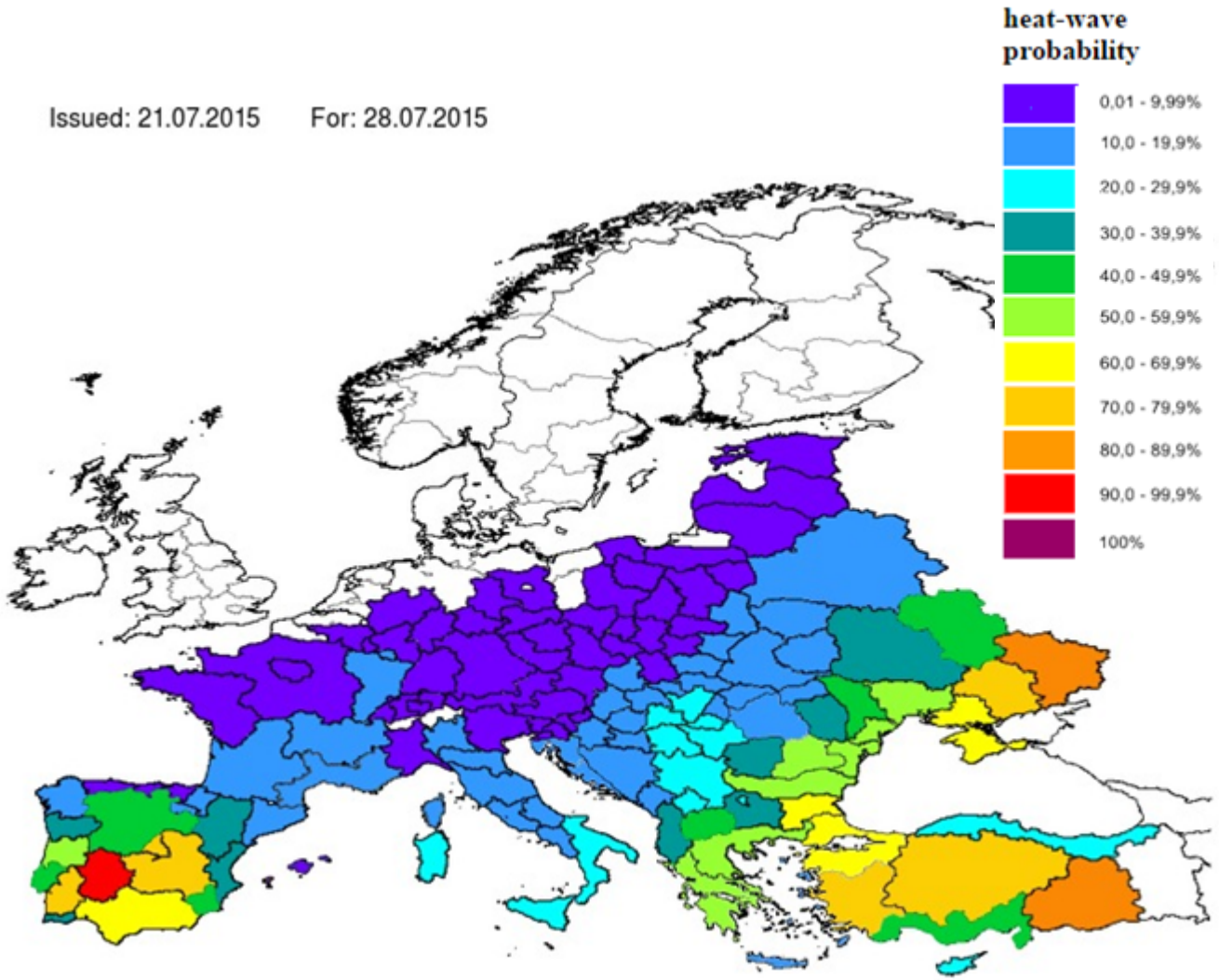
- Assessment performed in 2013: Are European countries prepared for the next big heat-wave?
  Bittner, Matthies, Dalbokova, Menne (2013) EJPH 24(4):615-619
- HHAPs from WHO European Member States
- **18 of 51 countries have developed HHAP (no data for 2)**
  - 3 are federalized: Austria, Germany, Switzerland (and UK)
  - **Only 3 described all 8 core elements** (Croatia, FYROM, UK)

Monitoring and evaluation

- **Only 2 countries included evaluation measures; evaluation was only mentioned in 7 countries**
- **Long-term measures (i.e. urban planning, reduction of indoor heat exposure) underrepresented – perhaps in other sectors' policies**

Countries / Indicators	Year	Lead body	Alert system	Information plan	Indoor heat reduction	Vulnerable groups	Health care preparedness	Urban planning	Real-time surveillance	Evaluation	Sum Score
Austria (regional)	2011							**			13.75
Belgium	2005							**			11
Croatia	2012										16
France	2012							**			16.25
Germany (regional)	2004-2008							**			10
Hungary	2007										12
Italy	2008										15
Luxembourg	2006				**			**			12
Moldova	2010										12
Monaco	2012							**			10
Netherlands	2007							**			15
Portugal	2010							**			17.5
Romania	2008										8
Serbia	2012							**			4
Spain	2012				**			**			12
Switzerland (regional)	2007							**			11
the FYR Macedonia	2010-2011										18.75
UK (regional)	2012										20

Tools and country support



- **Heat-wave probability tool**
- **Start of season:** annual heat-alert sent to all national focal points in mid–late April
- **Throughout the season** (April through September)**:**
  - Check heat-wave probability tool
  - If actionable, email alert sent to affected country focal point if no national/local heat–health action plan implemented

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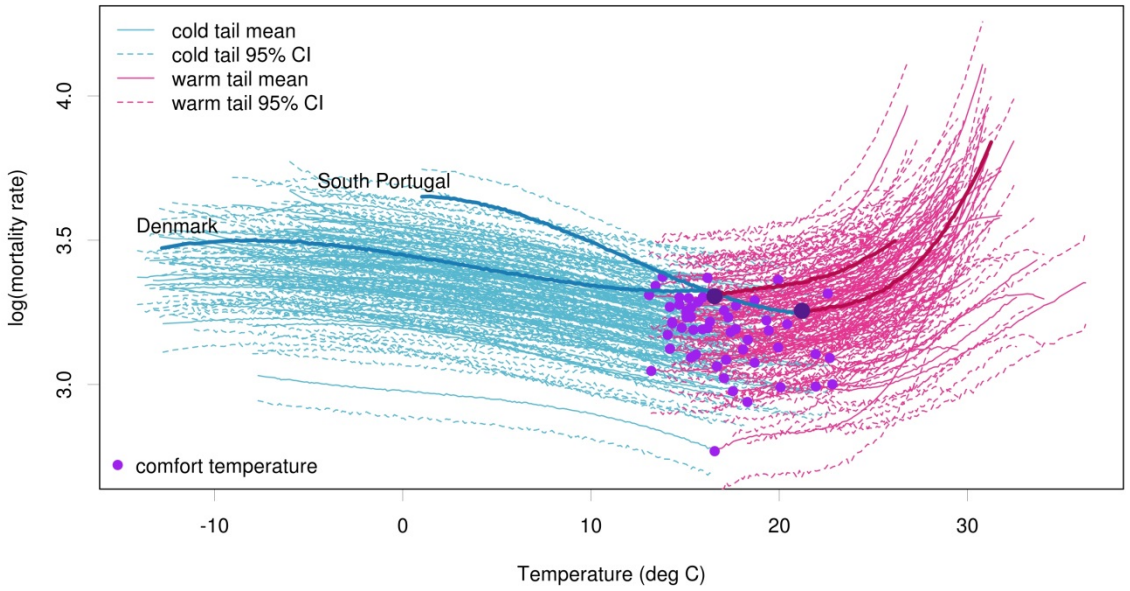
Current and future developments

- **Seasonal-to-decadal climate forecasts could provide an opportunity to anticipate temperature-related mortality**
- **Within FP7-funded EUPORIAS project, WHO/Europe and IC3 are developing a climate-driven mortality model for heat-waves**
- **Part of a wider initiative to stimulate climate service use and development for the health sector**
- Lowe, Ballester, Creswick, Robine, Herrmann and Rodó (2015) Evaluating the performance of a climate-driven mortality model during heat waves and cold spells in Europe. *International Journal of Environmental Research and Public Health 12*(2): 1279–1294

Background and data

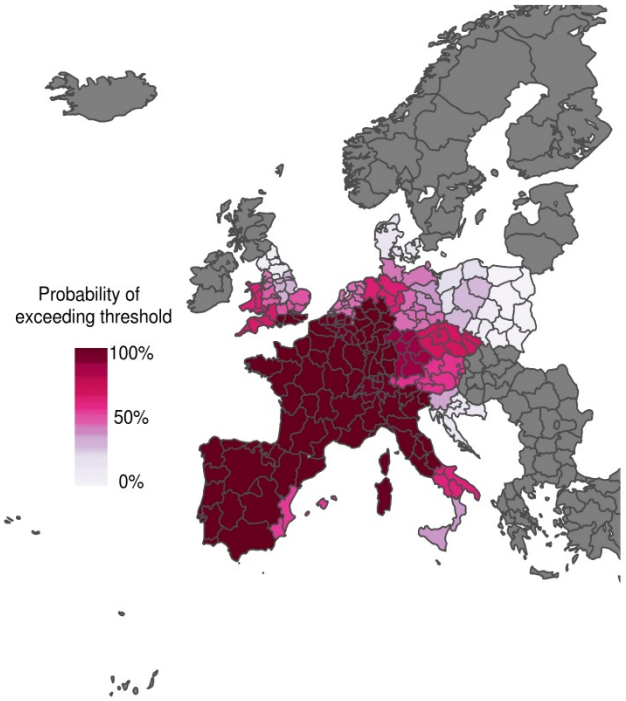
- Daily regional counts of mortality from Jan 1998–Dec 2003 were collected for 187 NUTS2 regions in 16 European countries.
- Data were aggregated to 54 larger regions in Europe, defined according to similarities in population structure and climate.
- Transfer functions were formulated for each region.

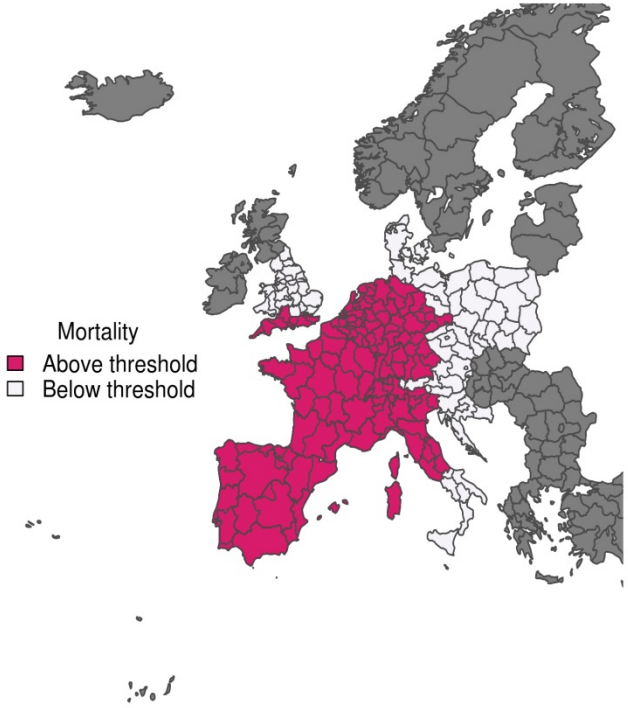


Heat-wave scenario

(a) Probabilistic map of exceeding emergency daily mortality threshold (75th percentile of daily mortality distribution in the warm tail);

(b) (b) Corresponding observations during a heat wave scenario (1–15 August 2003). The graduated colour bar represents the probability of exceeding the mortality threshold (ranging from 0%, pale colours, to 100%, deep colours).





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Evaluation of model

- **The model was successfully able to anticipate the occurrence or non-occurrence of mortality rates exceeding the emergency threshold in most regions, particularly for the heat wave scenario.**

Scenario	Emergency Threshold Defined for Each Region	ROC Score	Probability Decision Threshold	Hit Rate	False Alarm Rate	Proportion Correct
Heat wave 1–15 August 2003	75th percentile of mortality distribution	97%	**70%**	**85%**	**5%**	**89%**
			30%	100%	55%	80%
Cold spell 1–15 January 2003	75th percentile of mortality distribution	78%	70%	66%	20%	69%
			30%	93%	40%	87%

Future development

- Ideally, observed temperature data would be replaced with an ensemble of climate forecasts from state-of-the-art European forecasting systems (EUPORIAS and SPECS projects), to make mortality predictions several months ahead of imminent heat waves and cold spells.
- Through an iterative evaluation process with public health decision-makers, we hope to develop this work into a prototype climate service for public health, in line with the needs and understanding of future users.
- Need for downscaling to support local decision-making.

Links and references

Heat–Health Action Plans – Guidance

www.euro.who.int/heat-health-action-plans-guidance

Public health advice on preventing health effects of heat – information sheets

www.euro.who.int/public-health-advice-on-heat

EuroHEAT heat-wave probability tool

http://www.euroheat-project.org/dwd/

Lowe, Ballester, Creswick, Robine, Herrmann & Rodó (2015) **Evaluating the performance of a climate-driven mortality model during heat waves and cold spells in Europe**. *Int. J. Environ. Res. Public Health 12*(2): 1279–1294
http://www.mdpi.com/1660-4601/12/2/1279

Thank you!

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