

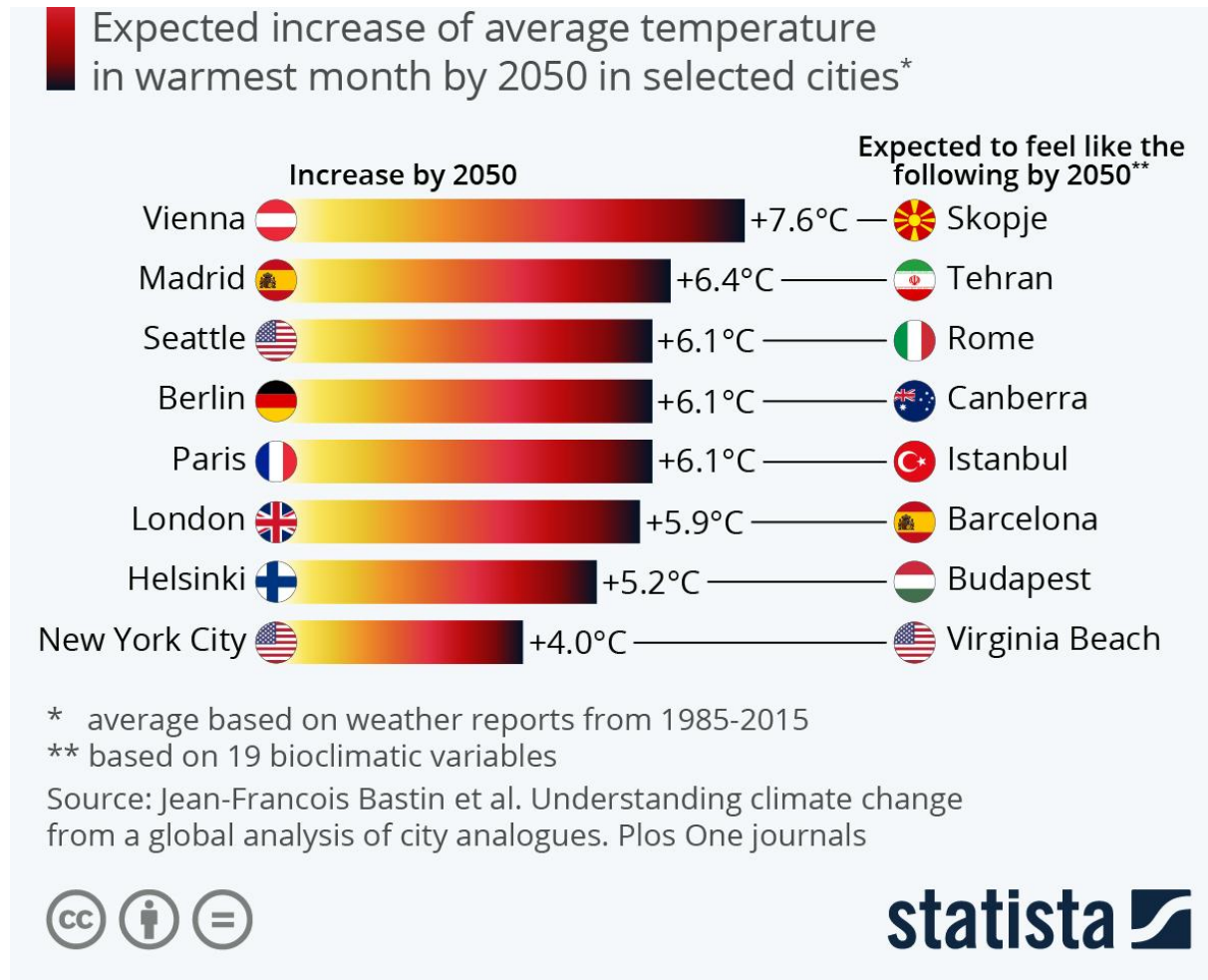
Natural disasters and climate change – what this means for health: A spotlight on Heatwaves

Heat health action plans – what can be done?

Dr Franziska Matthies-Wiesler
EU Health Policy Platform, 4 June 2025

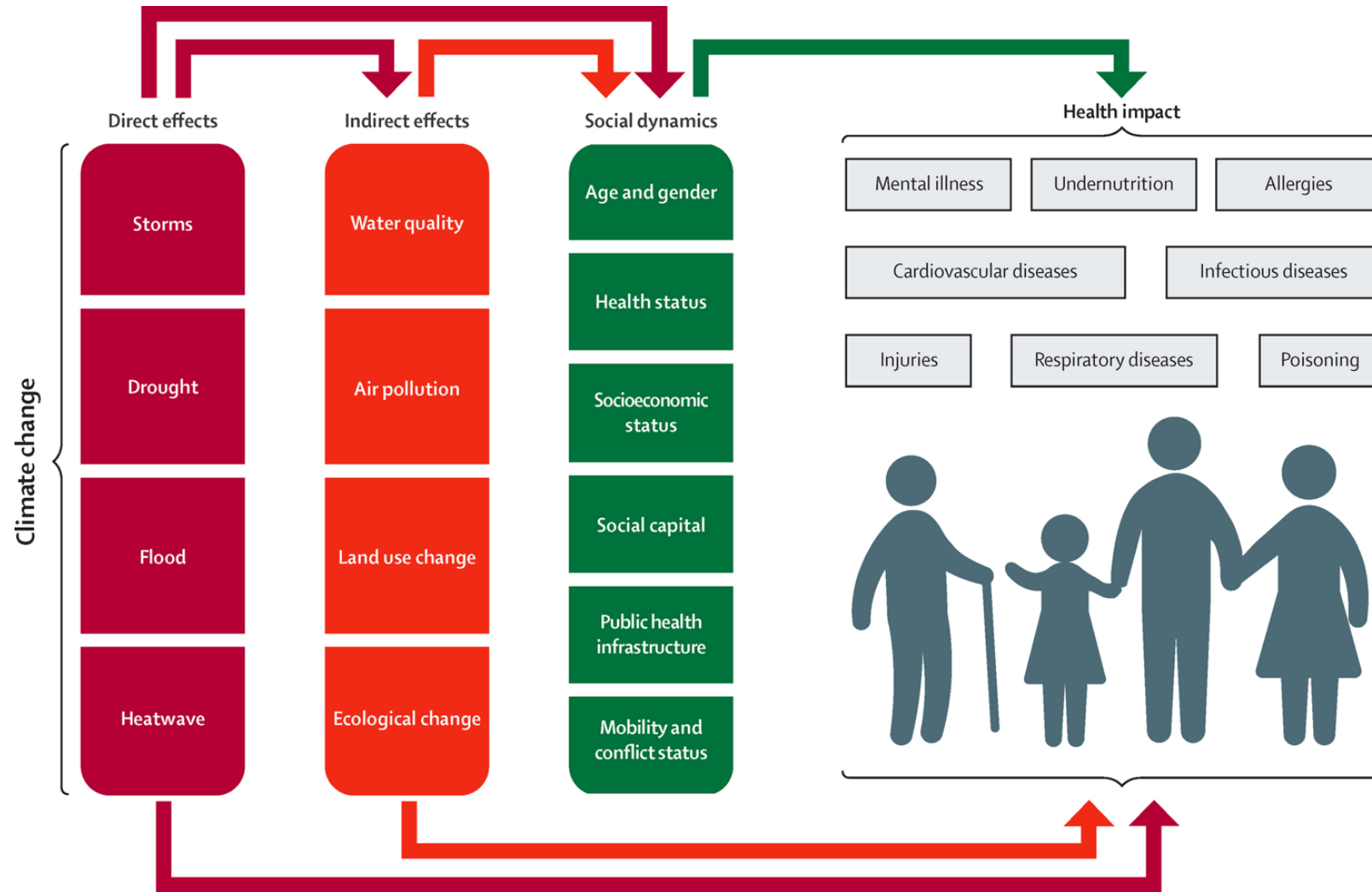


Europe's cities: increasingly becoming climate hotspots

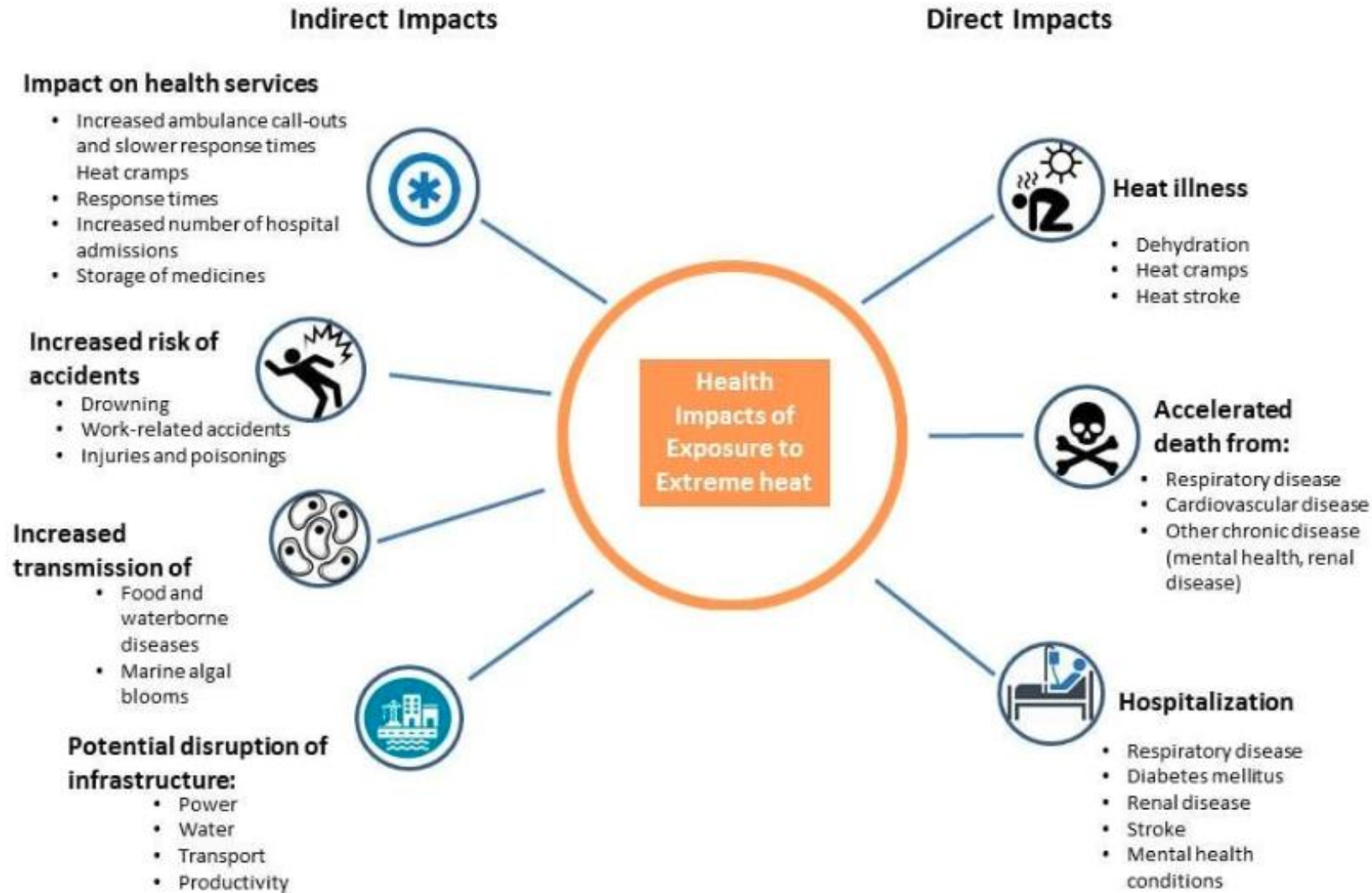


Bastin et al. Understanding climate change from a global analysis of city analogues. PLoS One 2019. doi: 10.1371/journal.pone.0217592.

Climate change impacts health via multiple pathways



Health impacts of heat



<https://www.who.int/news-room/fact-sheets/detail/climate-change-heat-and-health#:~:text=Even%20small%20differences%20from%20seasonal%20average%20temperatures%20are,conditions.%20Heat%20also%20has%20important%20indirect%20health%20effects>

Vulnerable population groups

Category	Risk group
Physiological adaptive capacity	▶ Older persons (>65 years) ▶ Infants and young children ▶ Pregnant women
Pre-existing conditions	▶ Cardiovascular diseases (e.g. arterial hypertension, coronary heart disease, cardiac insufficiency) ▶ Cerebrovascular diseases (e.g. stroke) ▶ Respiratory diseases (e.g. COPD, bronchial asthma) ▶ Metabolic diseases (e.g. diabetes mellitus) ▶ Neurological diseases (e.g. Parkinson's disease due to impaired thermoregulation) ▶ Mental health conditions (e.g. depression, schizophrenia, drug addiction) ▶ Kidney diseases (e.g. renal insufficiency) ▶ Obesity ▶ Those taking certain medicines to treat the diseases mentioned (see Table 1)
People with disabilities	▶ Physical disabilities (e.g. spinal cord injuries [58]) ▶ Mental disabilities, as people with severe cognitive impairments are less able to protect themselves from heat
Functional limitations	▶ Being confined to bed ▶ Residing in care facility
Socioeconomic factors	▶ Social isolation, especially in old age ▶ Homelessness ▶ Unfavourable housing situation
Physical exertion in high outdoor temperatures	▶ People working outdoors (e.g. in agriculture, construction) ▶ Outdoor sports ▶ Health workers, especially in combination with personal protective equipment
Workers who cannot leave their workplace during heat events despite high indoor temperatures	▶ Personnel in medical and care facilities, especially in combination with personal protective equipment

COPD=chronic obstructive pulmonary disease

PLUS: unusual heat exposure: e.g. tourists,; people who are unaware of their risk

Winklmayr et al., 2023:

https://www.rki.de/EN/News/Publications/Journal-of-Health-Monitoring/GBEDownloads/JFocus_en/JHealthMonit_2023_S4_Heat_climate_change_health.pdf?__blob=publicationFile&v=1

Health-

Monitoring/GBEDownloads/JFocus_en/JHealthMonit_2023_S4_Heat_climate_change_health.pdf?__blob=publicationFile&v=1

Effects of high air temperatures on cause-specific mortality

Heat effects:
Relative Risk (RR)
reported as daily change
in temperature from
75th to 99th percentile

Region	N. cities	Natural-cause			Cardio-pulmonary			Cardiovascular			Respiratory		
		RR	95% CI	CI	RR	95% CI	CI	RR	95% CI	CI	RR	95% CI	CI
Europe	204	1.53	1.33	1.75	1.61	1.35	1.93	1.49	1.25	1.77	2.10	1.61	2.75
<u>North</u>													
Norway	4	1.40	1.10	1.77	1.39	0.99	1.95	1.14	0.80	1.62	2.30	1.31	4.04
Sweden	3	1.29	1.10	1.52	1.32	1.06	1.64	1.26	1.01	1.56	1.84	1.25	2.71
Finland	1	1.55	1.26	1.91	1.31	0.98	1.76	1.24	0.92	1.67	1.88	1.05	3.36
Estonia	5	1.41	1.14	1.76	1.32	0.98	1.76	1.32	0.99	1.77	1.49	0.76	2.91
<u>Central-Western</u>													
England, Wales	72	1.41	1.22	1.64	1.60	1.33	1.94	1.45	1.20	1.75	2.09	1.56	2.80
Ireland	6	0.94	0.79	1.11	0.88	0.70	1.12	0.83	0.65	1.06	1.06	0.74	1.53
Germany	15	1.94	1.68	2.25	2.18	1.80	2.64	1.98	1.64	2.39	3.58	2.63	4.89
France	18	3.01	2.59	3.49	3.07	2.51	3.74	2.79	2.29	3.40	4.17	3.02	5.77
Czech Republic	4	1.49	1.27	1.75	1.66	1.35	2.05	1.65	1.34	2.03	1.95	1.29	2.93
Switzerland	8	1.45	1.21	1.73	1.55	1.21	1.98	1.52	1.18	1.95	1.86	1.15	3.00
<u>South</u>													
Italy	8	1.32	1.07	1.62	1.42	1.06	1.90	1.37	1.02	1.85	1.88	1.07	3.28
Spain	50	1.47	1.24	1.75	1.60	1.26	2.03	1.48	1.16	1.90	1.74	1.18	2.58
Portugal	2	2.46	2.06	2.94	3.40	2.66	4.35	2.85	2.22	3.66	5.65	3.71	8.59
Greece	8	1.80	1.47	2.20	2.14	1.64	2.80	2.10	1.60	2.76	2.16	1.33	3.52



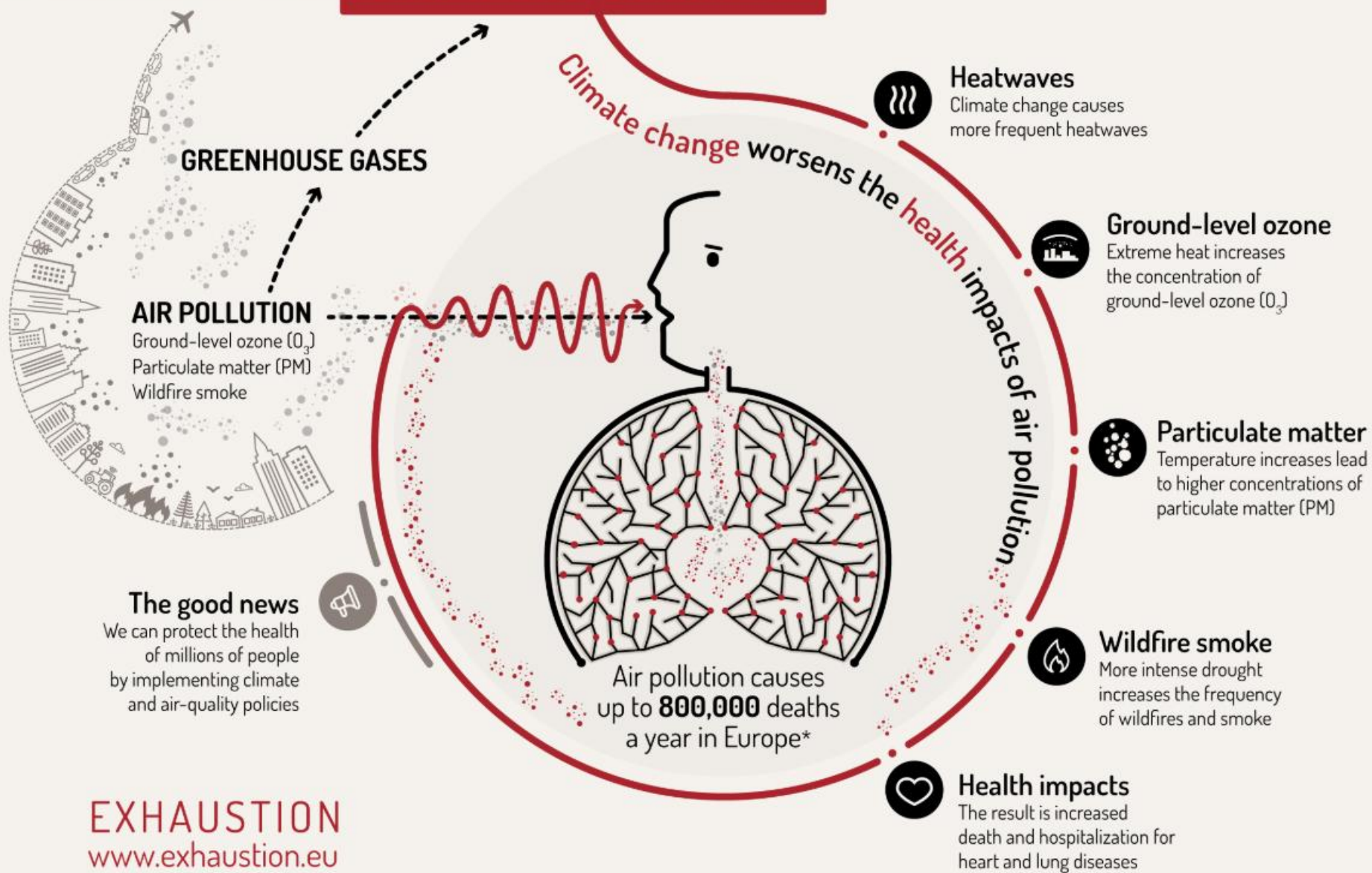
EXHAUSTION

Project EXHAUSTION, Deliverable D2.3

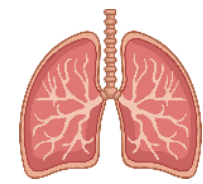
<https://www.exhaustion.eu/>

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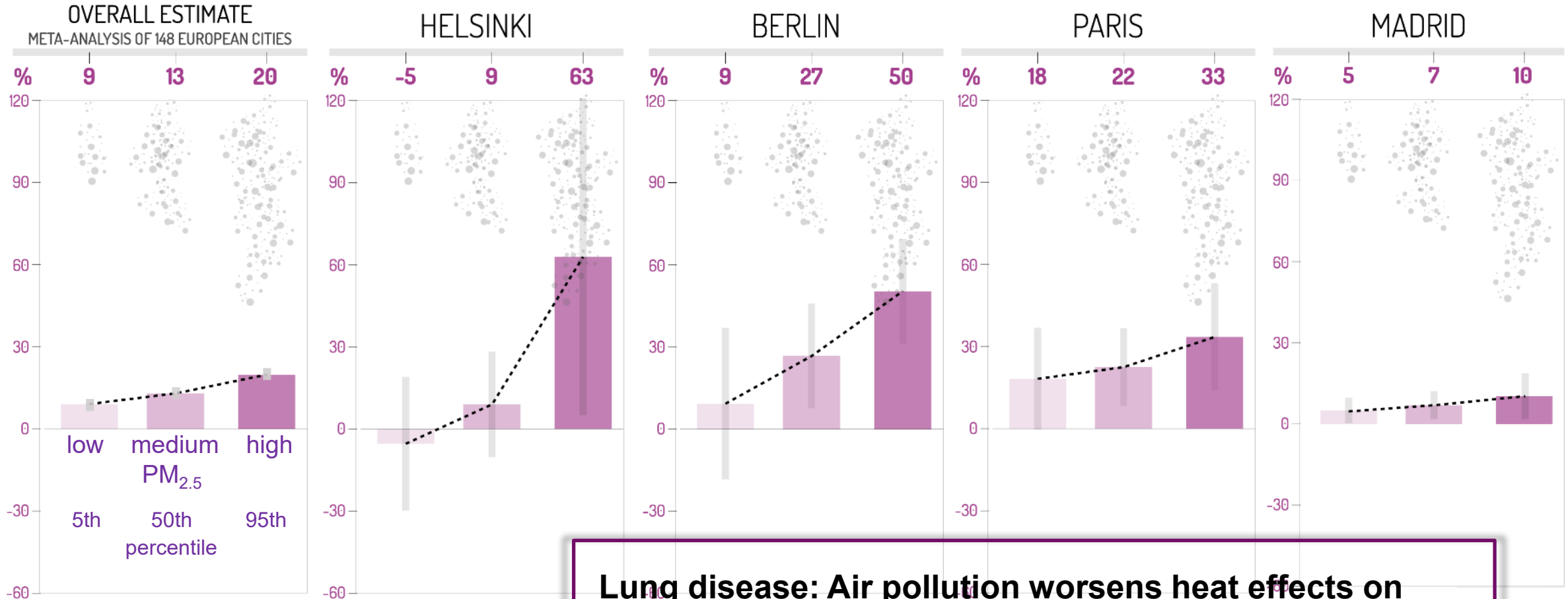
WE BREATHE CLIMATE CHANGE



Respiratory mortality – heat effect modification by fine particles (PM_{2.5}) in European cities



Mortality effects for 2-day ave. increase in temperature from 75th to 99th percentile



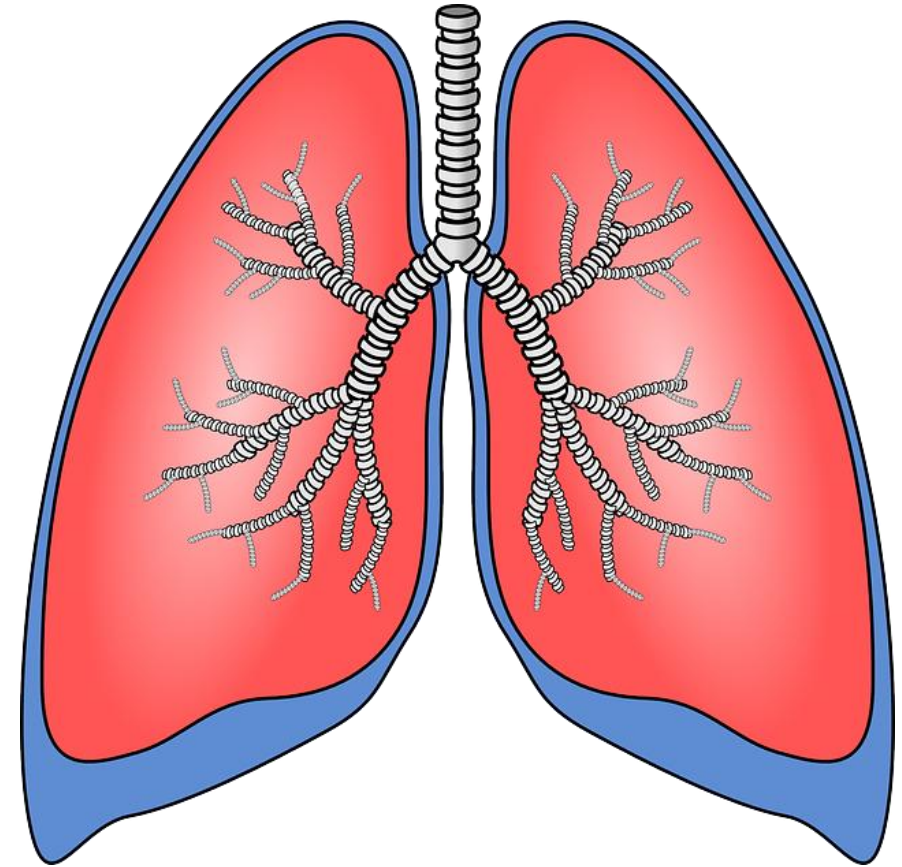
Lung disease: Air pollution worsens heat effects on mortality.

**Scientific input to WHO Regional Office for Europe:
Update to heat-health action plan guidance**

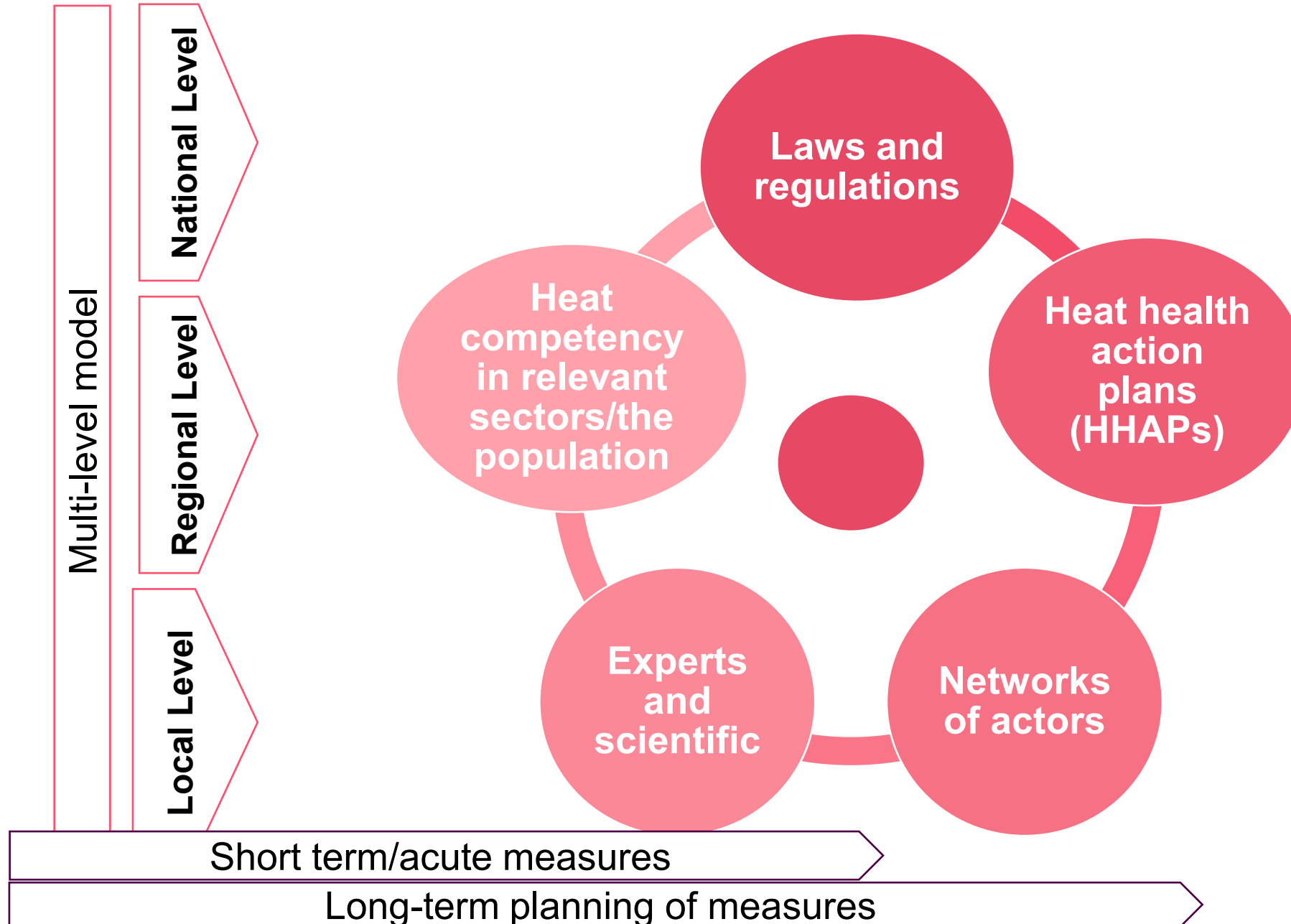
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Joint effects of heat and air pollution

- ✓ High air pollution levels and high temperatures have an effect on heart and lung related death and disease.
- ✓ Individuals with chronic pulmonary diseases are particularly affected when high temperatures coincide with high levels of air pollution.
- ✓ Heat-related lung problems together with increased air pollution increase the risk of morbidity and mortality for affected patients during heatwaves.

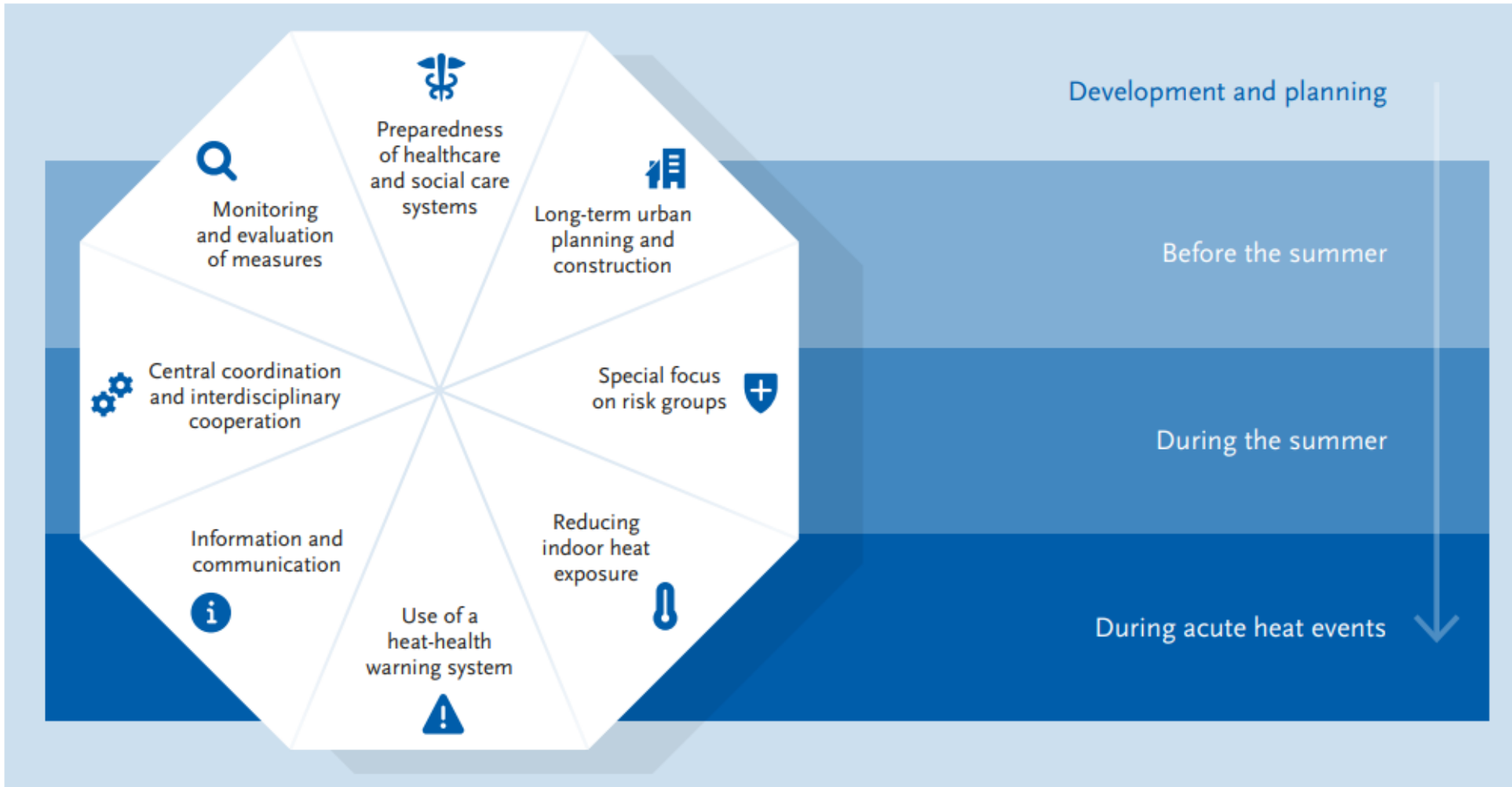


What is needed for a heat-resilient society?



Climate change mitigation
in all dimensions

Health health action plans – 8 core elements

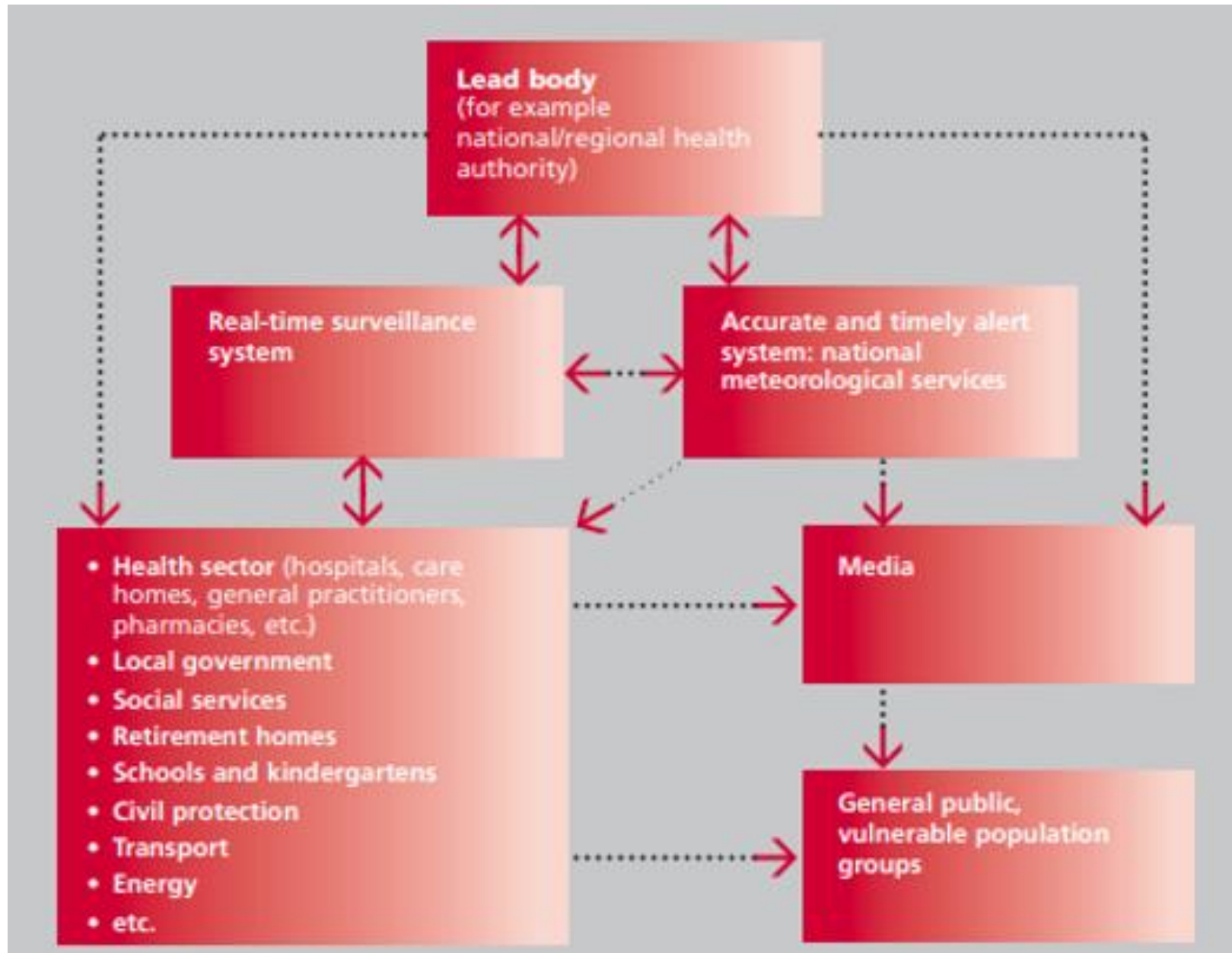


Winklmayr et al., 2023: https://www.rki.de/EN/News/Publications/Journal-of-Health-Monitoring/GBEDownloadsJ/Focus_en/JHealthMonit_2023_S4_Heat_climate_change_health.pdf?__blob=publicationFile&v=1

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WHO Regional Office for Europe (2008): <https://www.who.int/publications/i/item/9789289071918>

Potential cascade of information and action in HHAPs



Heat prevention measures targeted to vulnerable groups



Education and training

Healthcare workers and social workers.



Information campaigns

Dissemination of information on risks and recommendations through different means of communication.



Infrastructural measures

Retrofitting/renovation of school buildings/hospitals or buildings in deprived neighborhoods.



Healthcare facilities emergency protocols

- institution-level: control indoor temperature and ventilation
- patient-level: hydration, adjusting, medication health surveillance, rescheduling activities



Active outreach/ surveillance

Phone calls/home visits by healthcare/social workers or volunteers providing health monitoring, home and personal care and help with basic needs.



Acclimatisation interventions and cooling of spaces



Cooling strategies for workers/athletes

Rescheduling training sessions/work shifts, increase number and duration of breaks in the shade.

Behavioural adaptation

En période de fortes chaleurs ou de canicule

Personne âgée
Je mouille ma peau plusieurs fois par jour tout en assurant une légère ventilation et ...

- Je ne sors pas aux heures les plus chaudes.
- Je passe plusieurs heures dans un endroit frais ou climatisé.
- Je maintiens ma maison à l'abri de la chaleur.
- Je mange normalement (fruits, légumes, pain, soupe...).
- Je bois environ 1,5 L d'eau par jour. Je ne consomme pas d'alcool.
- Je donne de mes nouvelles à mon entourage.

Enfant et adulte
Je bois beaucoup d'eau et ...

- Je ne fais pas d'efforts physiques intenses.
- Je ne reste pas en plein soleil.
- Je maintiens ma maison à l'abri de la chaleur.
- Je ne consomme pas d'alcool.
- Au travail, je suis vigilant pour mes collègues et moi-même.
- Je prends des nouvelles de mon entourage.

En cas de malaise ou de coup de chaleur, j'appelle le 15
Pour plus d'informations : 0 800 06 66 66 (appel gratuit depuis un poste fixe)
www.sante.gouv.fr/canicule-et-chaleurs-extremes
www.meteo.fr

INPES

- Adjusting drinking behaviour
- Wearing loose-fitting clothes from natural materials
- Staying in the shade
- Carrying out strenuous physical activities in the cooler hours of the day
- Keeping the home cool (e.g. closing shutters during the day)
- Helping others

Plan canicule - France

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Structural adaptation measures in the environment



Stadt Wien (<https://www.wien.gv.at/verkehr-stadtentwicklung/coolestrasse.html>)

- Green in the city
- Passive cooling in buildings
- Shaded areas for breaks at outdoor workplaces or at day care centres for children and in schools
- Public drinking fountains
- Cooling centres and facilities
-

Awareness raising needs to target vulnerable groups

- 2/3 demonstrate risk factors. Only 1/3 considered themselves as person at risk. So more than 1/3 underestimated their own heat-related health risk.
- Those who do not know their own risk status do not adjust their behaviour.
- Underestimated risk factors are: chronic diseases, adipositas, intensive sport, heavy physical labour, work outdoors, alcohol consumption and age >65 years.
- Those who know little about health effects of heat still feel well informed.
- Those who look after persons at risk, either professionally or in their personal context, knew less about heat related health risks.

Medical doctors and medical professionals have a key role in raising awareness!

The role of pneumologists in heat health protection

Pulmonologists can contribute to heat-related health protection of their patients through heat-specific advice and treatment.

Pulmonologists need to be well-informed and implement heat protection measures in their practices and hospital departments.

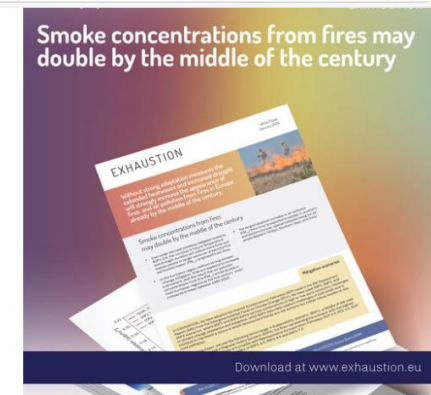
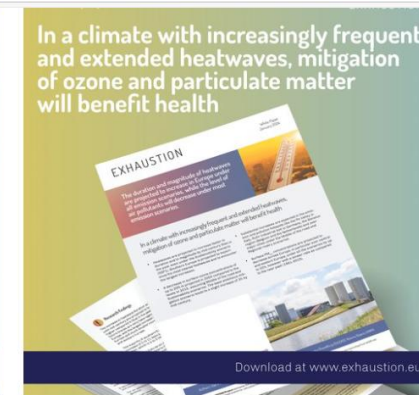


Matthies-Wiesler et al., 2023: <https://link.springer.com/article/10.1007/s10405-023-00500-5> HELMHOLTZ MUNICH

Translated from Nidens et al., 2024, Communication Concept: www.hitzeservice.de

Policy implications

- Policies reducing air pollution will contribute to preventing death and disease from heat due to the interactive effects of air pollution and heat.
- The joint effects of air pollution and heat need to be considered in heat-health action plans as they are being developed across Europe.
- Combining air pollution and climate change policies is essential to avoid trade-offs and harvest health co-benefits





Thank you.



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