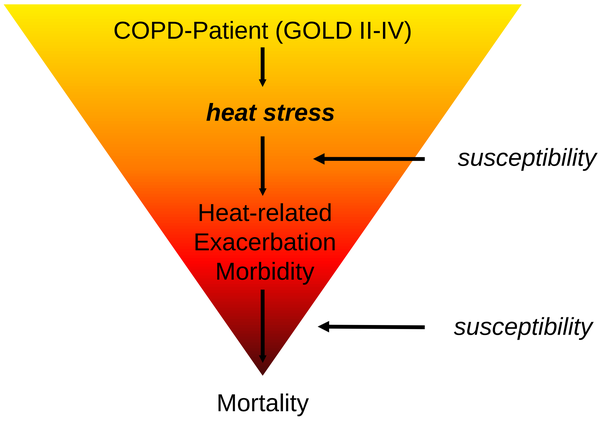
UCaHS - Urban Climate and Heat Stress in mid-latitude cities in view of climate change

Sub-project 3.1
Medical vulnerability

Research questions

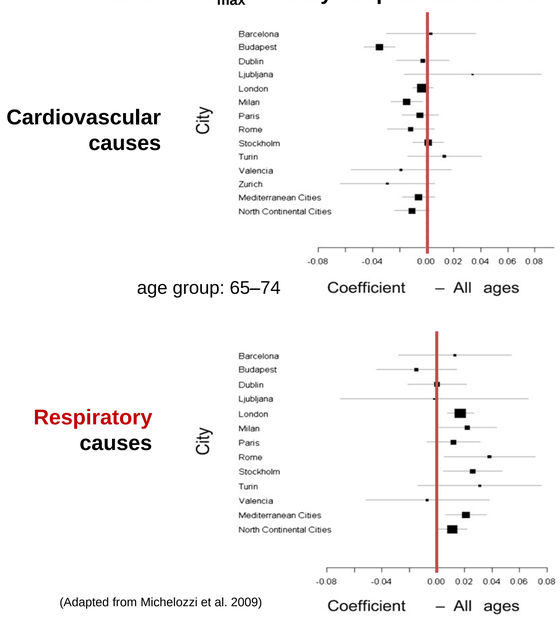
Heat-related disease exacerbation / Heat as a disease promoting factor?



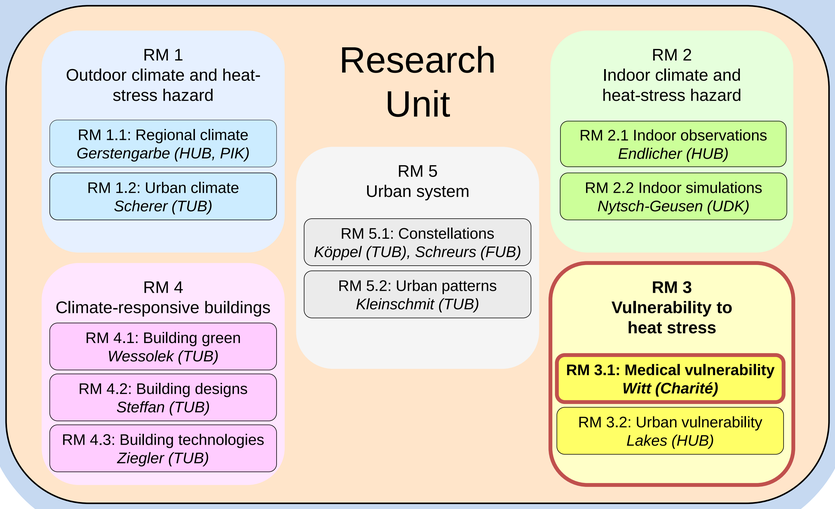
Identification of parameters (potential risk factors) referring to increased vulnerability of COPD-patients to heat stress and heat-related disease exacerbation at home and in hospital.

- Is there a relationship between medical parameters reflecting disease status, i.e. lung function, blood pressure, vegetative tone, sleep quality and pharmacotherapy and outdoor as well as indoor climate conditions?
- Is there a special phenotype of COPD, who is vulnerable to heat stress?
- Accelerates the use of air conditioning in the hospital sickroom the recovery of COPD exacerbation due to heat stress?

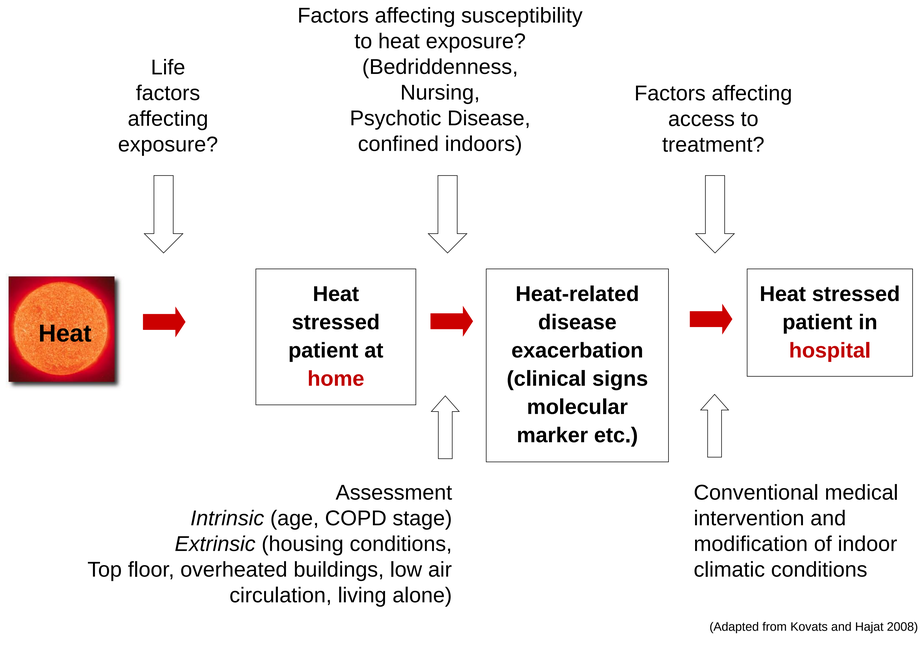
Effect of T_{max} on daily hospital admissions for



(Adapted from Michelozzi et al. 2009)



Research approach

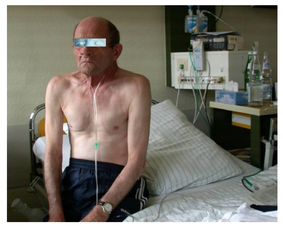


(Adapted from Kovats and Hajat 2008)

Methodology

Pilot Study: Identification of a special phenotype of COPD patient who is vulnerable to heat stress

We hypothesize a different pattern of adaptation to heat stress during day and night time in COPD (GOLD stage II-IV). Measurements (medical history, pharmacotherapy, body temperature, blood pressure, peak flow, lung function, electrocardiogram, sleep quality) will be performed once during stable disease under normal weather conditions and once during hot weather conditions.



Pilot Study: Impact of indoor cooling on vulnerable patients

Installation of a cooling ceiling in a hospital sick room. Measurement of body temperature, oxygen saturation, heart rate, respiratory frequency, activity as well as cognitive performance in hospitalized COPD patients. In order to find out the influence of air-conditioning in hospitals on recovery and hospitalization period. Comparison of medical and climate data of patient groups (cooled vs. non-cooled sick room)

Work schedule

WP	Description	Schedule
100	**Project management**	
110	Reporting	
120	Logistics and organisation	
200	**Individual research**	
210	Physiological measurements in heat stressed patients	
220	Measurement of clinical and climate data in vulnerable groups of patients	
221	Development of questionnaires	
230	Medical statistics	
300	**Collaboration within the Research Module**	
310	Vulnerability to heat stress, associated with clinical status and mortality of groups of patients	
400	**Collaboration within Research Links**	
420	Indoor heat stress in hospital, variation of indoor climate for patients	
450	Actions for hospital architecture for reducing heat-stress risks	
500	**Collaboration within Research Clusters**	
520	Present-day heat-stress hazards, vulnerability and risks	
530	Effectiveness of actions for reducing heat-stress risks	
600	**Collaboration within Research Unit**	
610	Projected heat-stress hazards, vulnerabilities and risks	
620	Transferability of the methodology to other mid-latitude cities	
630	Identification of future research and development activities	
640	Preparation of the follow-up proposal	

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