

The role of the EU HEAT-SHIELD project in mitigation of heat waves' impact on labor productivity



**LUČKA KAJFEŽ-BOGATAJ¹,
TJAŠA POGAČAR¹,
IGOR MEKJAVIČ²**

**¹BIOTECHNICAL FACULTY, UNIVERSITY OF
LJUBLJANA, SLOVENIA**

²JOZEF STEFAN INSTITUTE, SLOVENIA

16th EMS & 11th ECAC 2016
CE4 – Adaptation Strategies



HORIZON 2020

Public Health

Health promotion and disease prevention : improved
inter-sector co-operation for environment and health
based interventions

HEAT^o
SHIELD

Mission:

- HEAT-SHIELD is dedicated to **improve heat resilience** in European **workers** and provide know-how to the European community ranging from the individual citizen to public and private policy makers to implement methods and procedures that may **secure health and productivity** during **present and future** climatic heat scenarios

Vision:

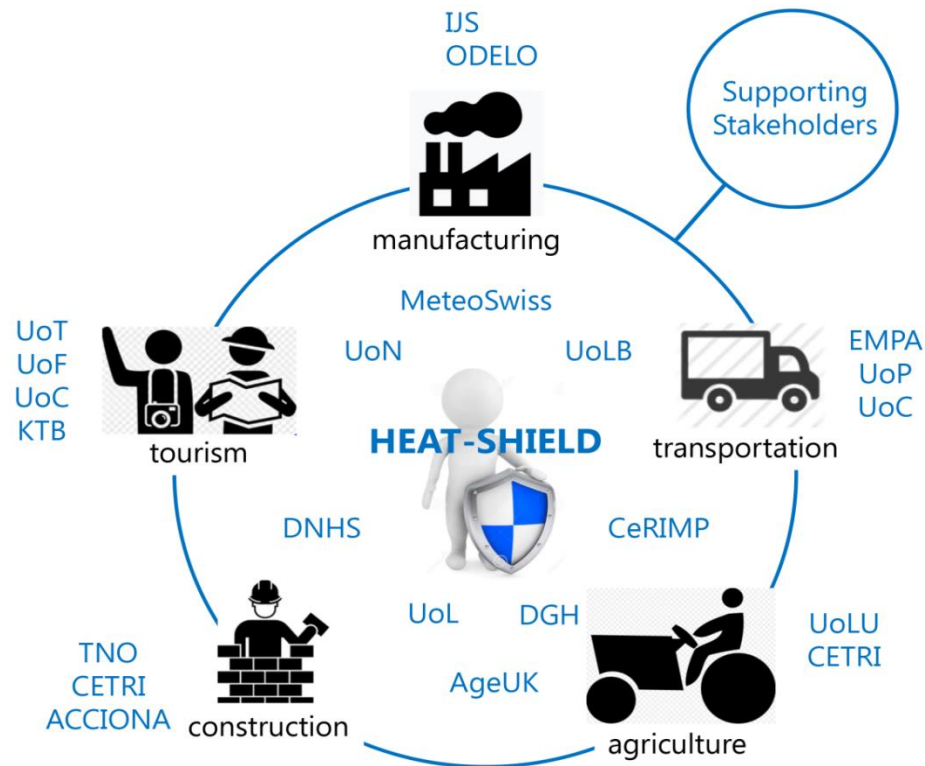
- All Europeans have access to expert support for **effective addressing current and future climatic heat scenarios** and public as well as private policy makers will take efficient actions to minimize the detrimental effects of elevated environmental temperatures.



Univerza v Ljubljani



Integrated inter-sector framework to increase the thermal resilience of European workers



Specific Objective 1

Forecast weather patterns for various climate change scenarios

Specific Objective 2

Assess the effects of different weather patterns

Specific Objective 3

Define technical and biophysical solutions to promote worker health and prevent disease

Specific Objective 4

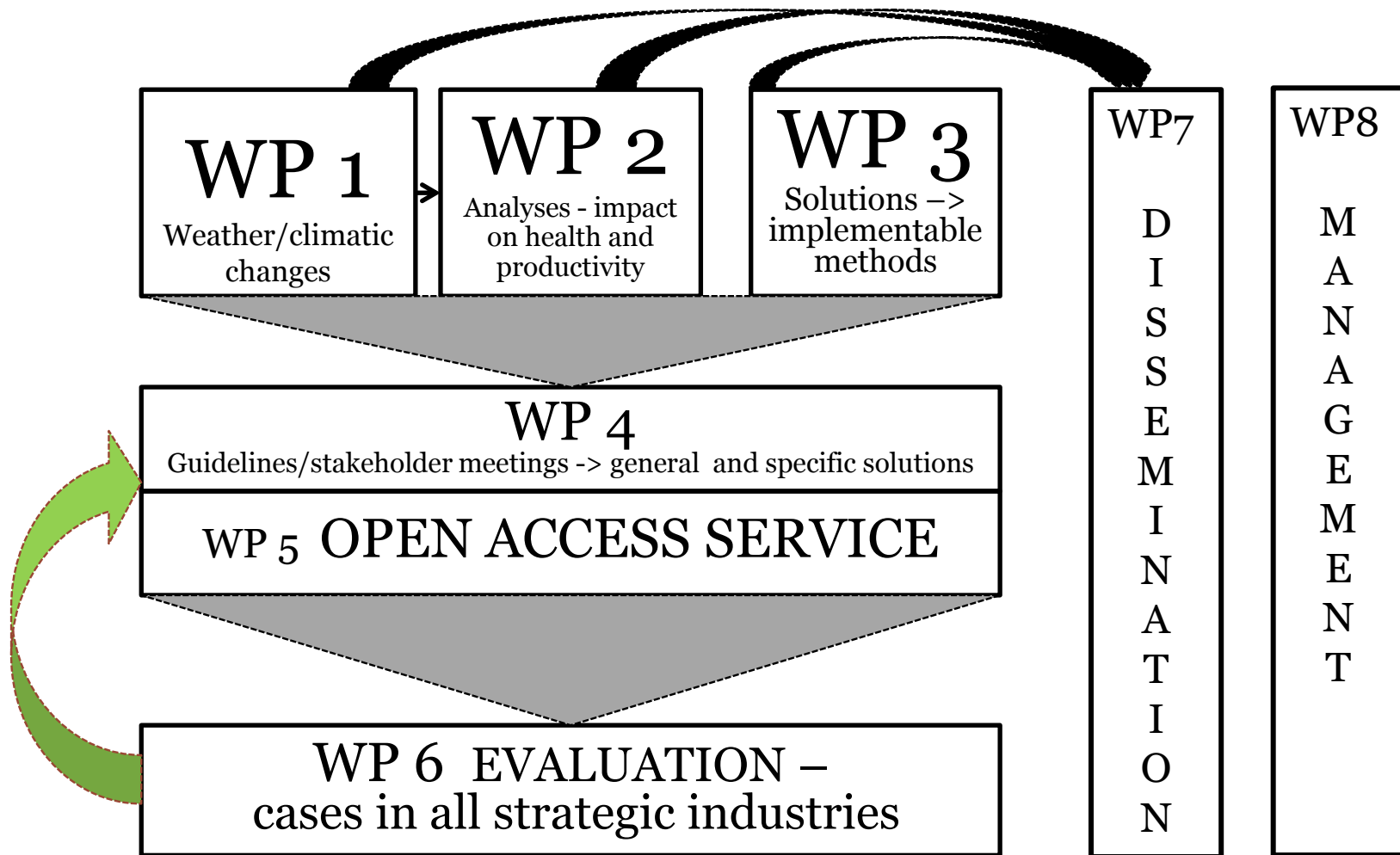
Formulate relevant guidelines

Specific Objective 5

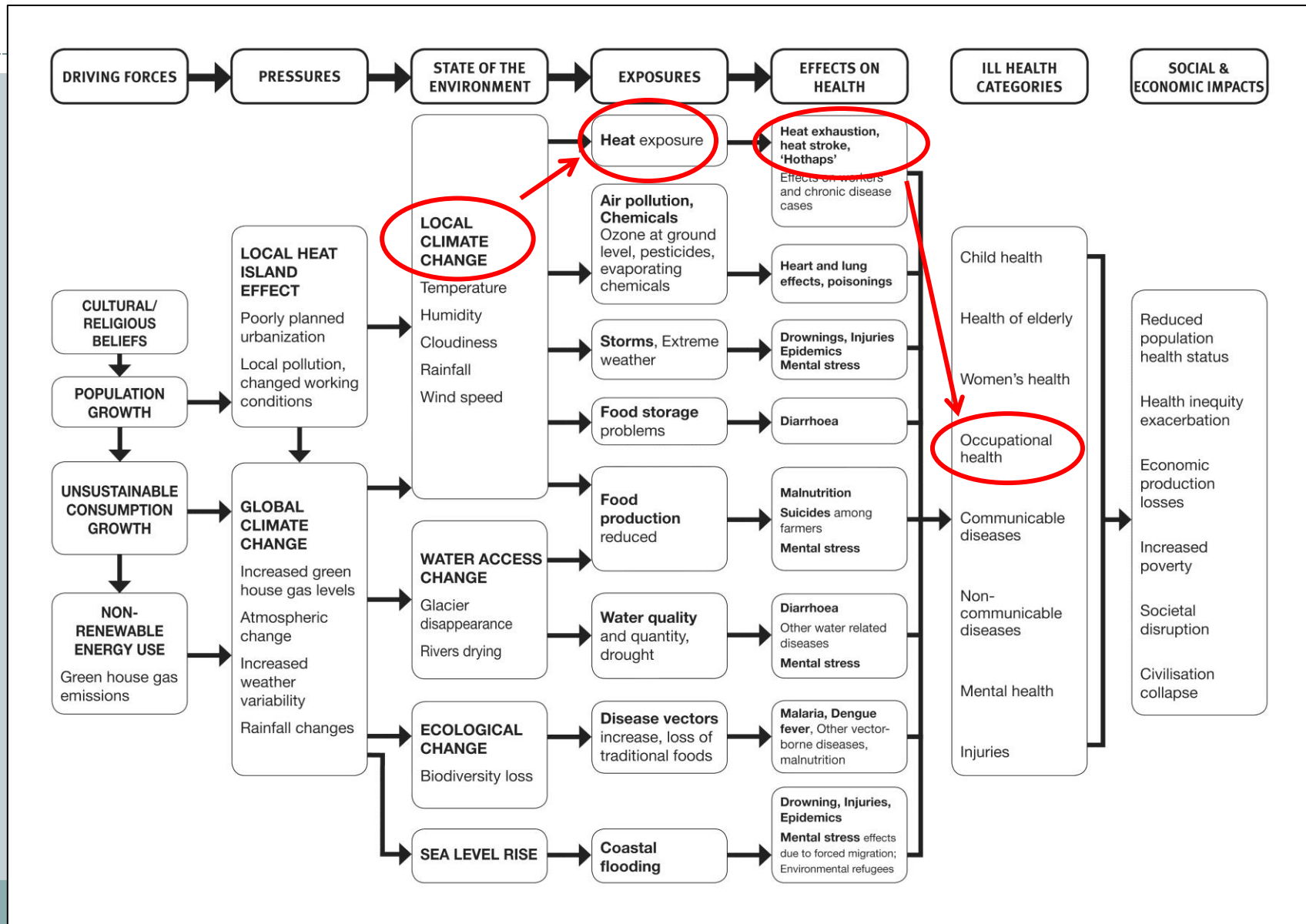
Develop an online open access service and disseminate adaptation guidelines

Specific Objective 6

Assess the effectiveness of formulated strategies



Health impacts of climate change, DPSEEA framework



Additional mortality in France – heat wave 2003

Heat wave victims by sex and age group

Age group	Number of heat wave victims			Percent distribution		
	Male	Female	Total	Male	Female	Total
0-9	19	-15	4	0,36	-0,15	0,03
10-19	-3	-20	-22	-0,05	-0,21	-0,15
20-29	40	-16				
30-39	109	-35				
40-49	246	58				
50-59	343	228				
60-69	551	456	1 007	10,52	4,80	6,83
70-79	1 326	1 888	3 214	25,32	19,85	21,80
80-89	1 849	3 593				
90 and over	759	3 371				
Total	5 238	9 509	14 748	100,00	100,00	100,00

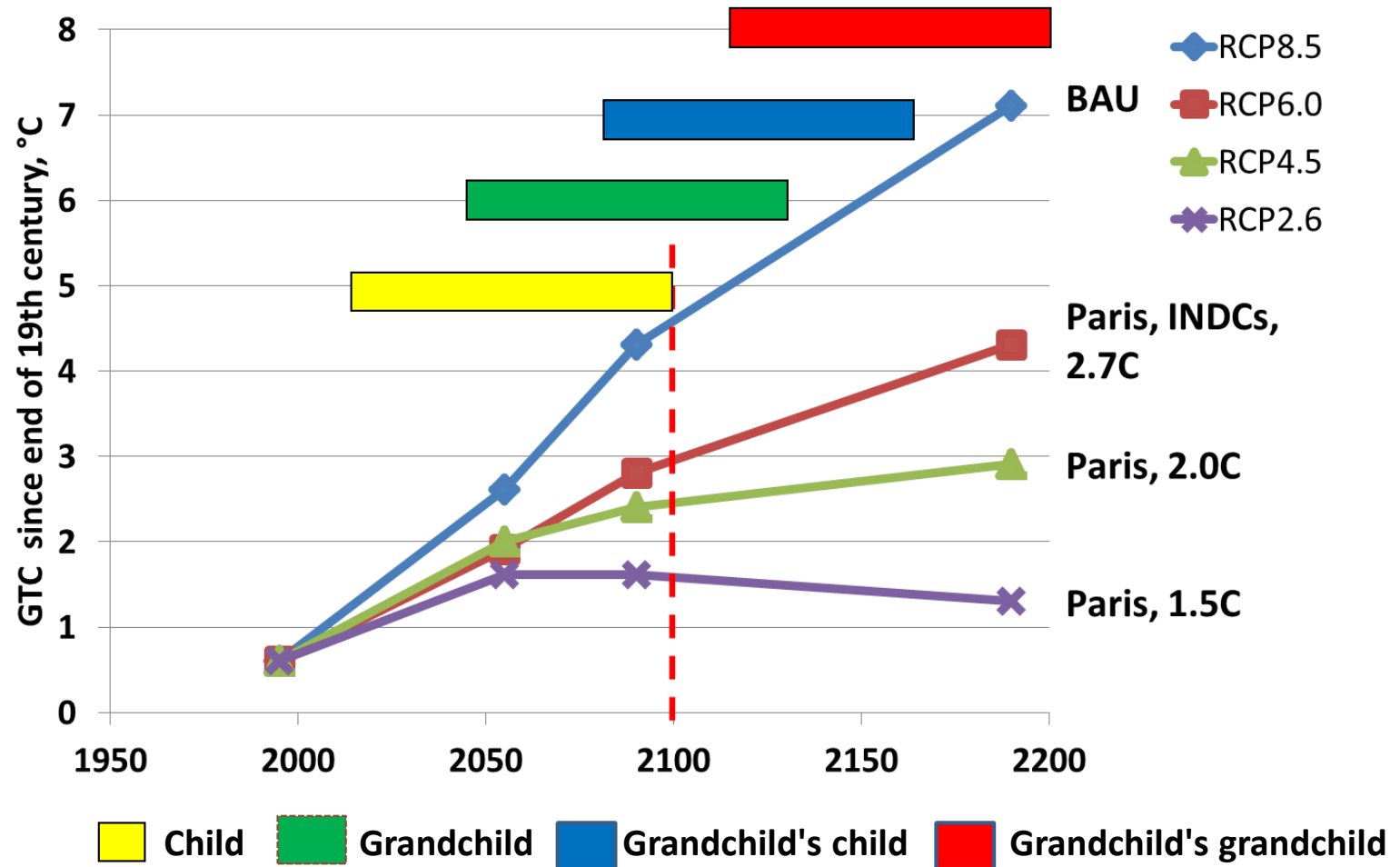
But in younger age groups, mainly male victims

.... WHY?Work?

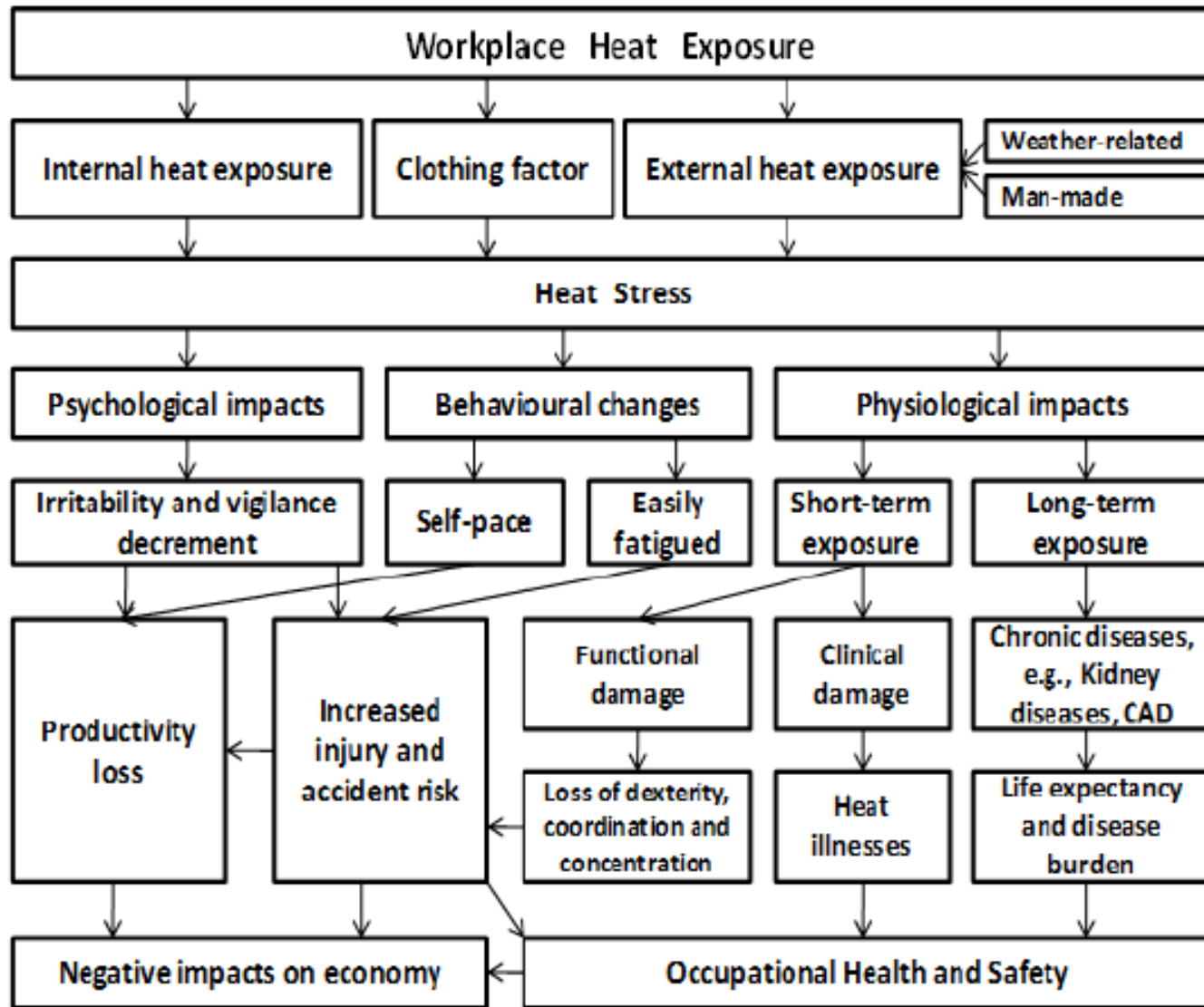
Overall mainly elderly women victims



Time trends of modeled global temperature change; Data in IPCC report and Paris (COP21) agreements



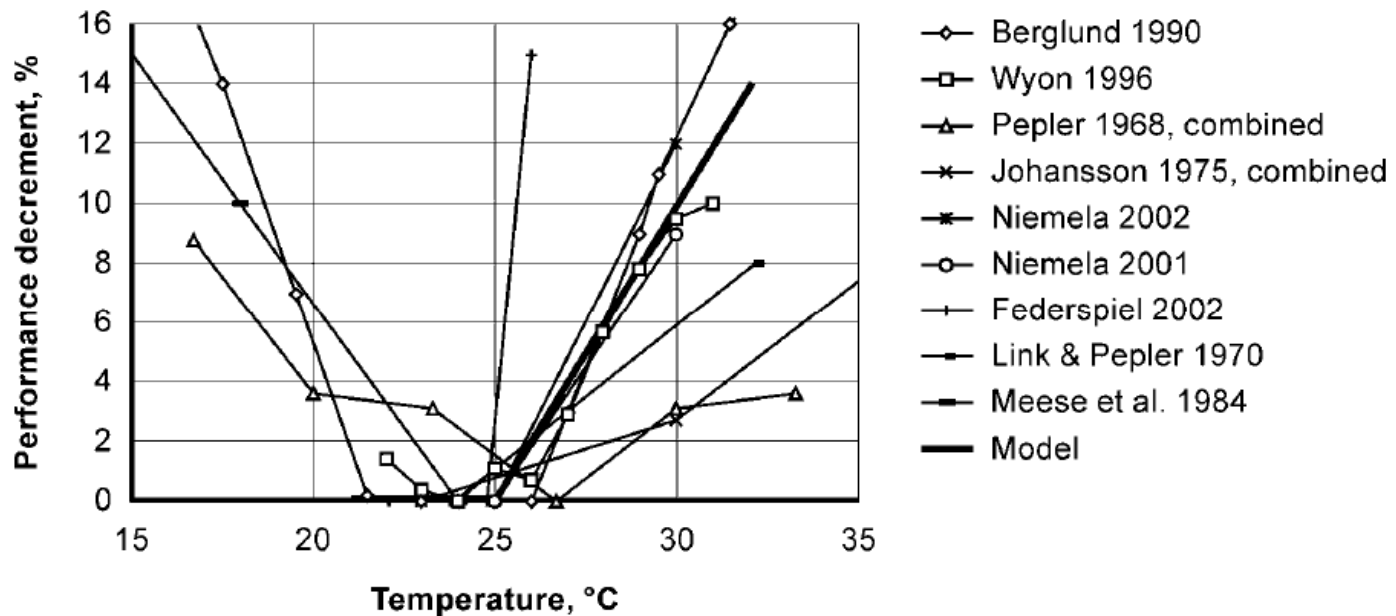
Workplace heat exposure and its impact



Productivity



Performance decrements vs. temperature



Seppanen (2004) review: 'This relationship has a high level of uncertainty; however, use of this relationship may be preferable to the current practice which ignores productivity.'

Example of Heat-related illness risk factors

(Niosh, 2016)



Vulnerable groups



Developing countries:

Working people in tropical and sub-tropical countries during the hot season, particularly if working in hot sunlight

Workers who need to work continuously at high physical intensity

Workers in slum workshops

Europe:

Agricultural workers

Construction workers

Transport workers

Manufacturing workers without cooling systems

Tourism activity workers

.... and special groups: Emergency workers, Migrant workers



T1.3 Development of a prototype for a pre-operational warning system



2



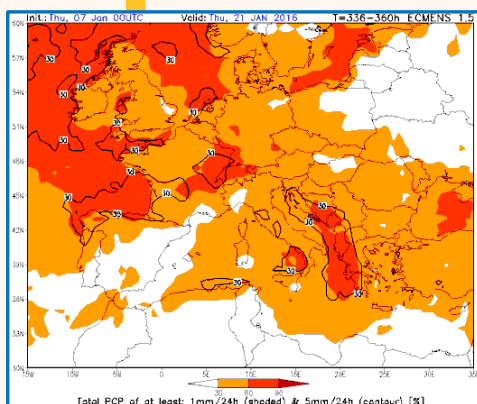
Web-site with some information
(ex. Heat index maps, WBGT maps in shadow/sun.....)

1

Prototype of an occupational health-warning system

3

Weather climate forecast



Workers Warning system

Specific weather warnings for Employers and Workers



Contacts



Name: Prof. Lars Nybo
Institution: University of Copenhagen
Country: Denmark
e-mail: nybo[at]nexs.ku.dk

Name: Dr. Andreas Flouris
Institution: University of Thessaly
Country: Greece
e-mail: andreasflouris[at]gmail.com

Name: Prof. Lučka Kajfež-Bogataj
Institution: University of Ljubljana
Country: Slovenia
e-mail: lucka.kajfez.bogataj[at]bf.uni-lj.si

Name: Prof. Tord Kjellstrom
Institution: CETRI
Country: Cyprus
e-mail: kjellstromt[at]yahoo.com

The work was supported, in part, by the European Union Horizon 2020 Research and Innovation action (Project number 668786: Heat Shield).

We are indebted to Profs. Lars Nybo, Andreas Flouris and Tord Kjellstrom for their assistance.

<http://heat-shield.eu/>
<https://www.facebook.com/HEATSHIELD.eu/>