Health impacts of extreme weather and climate events

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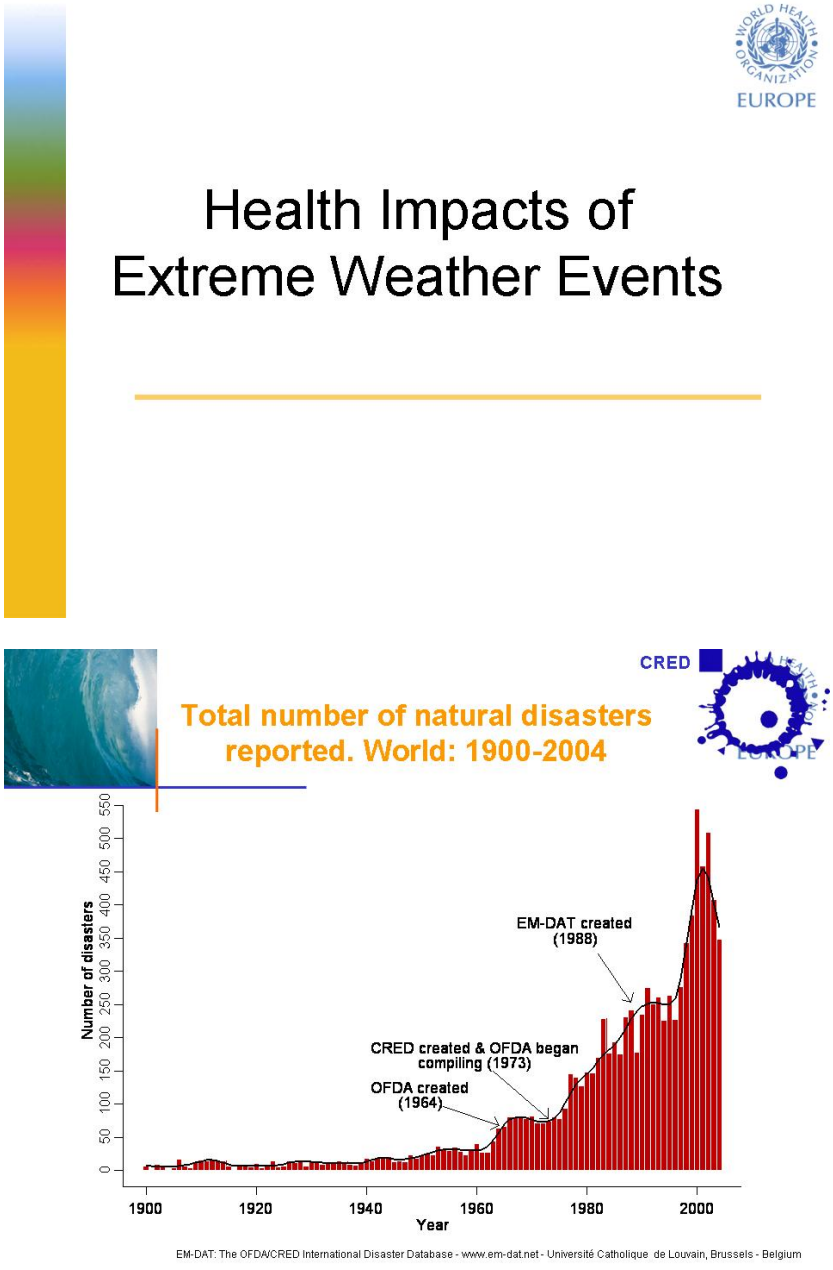
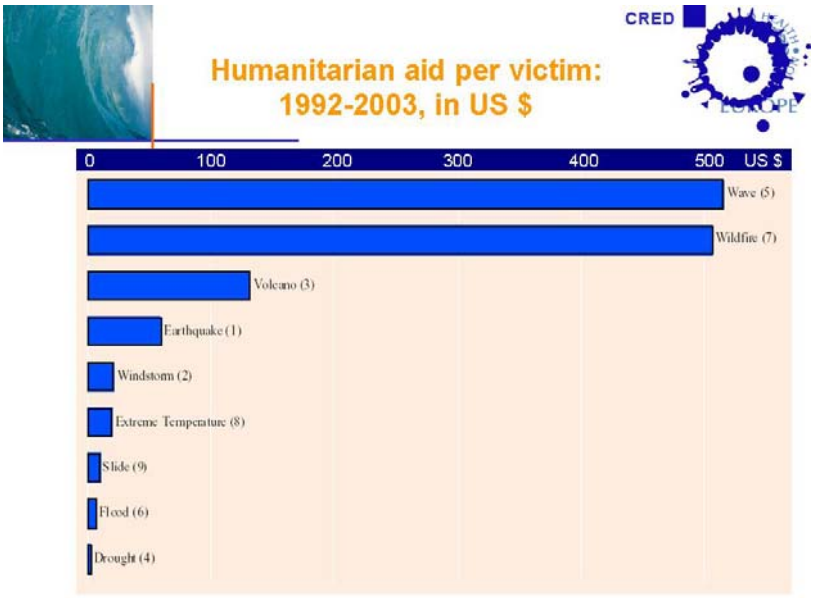
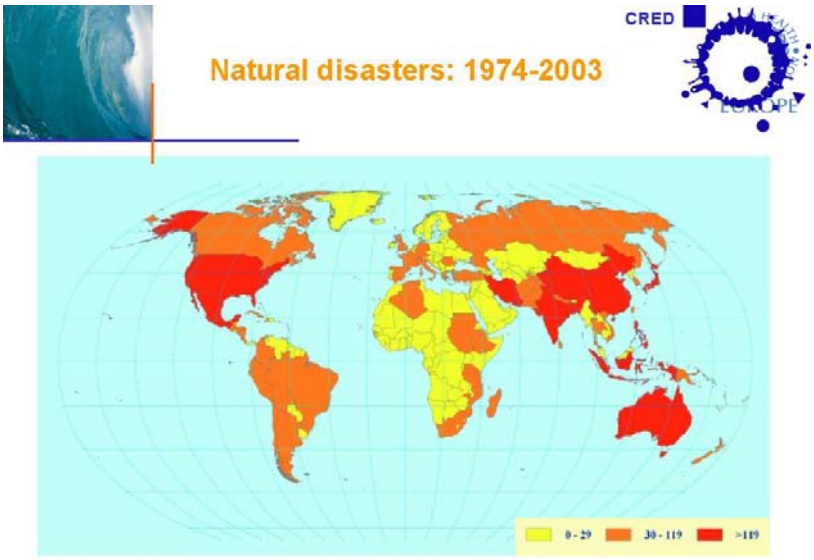
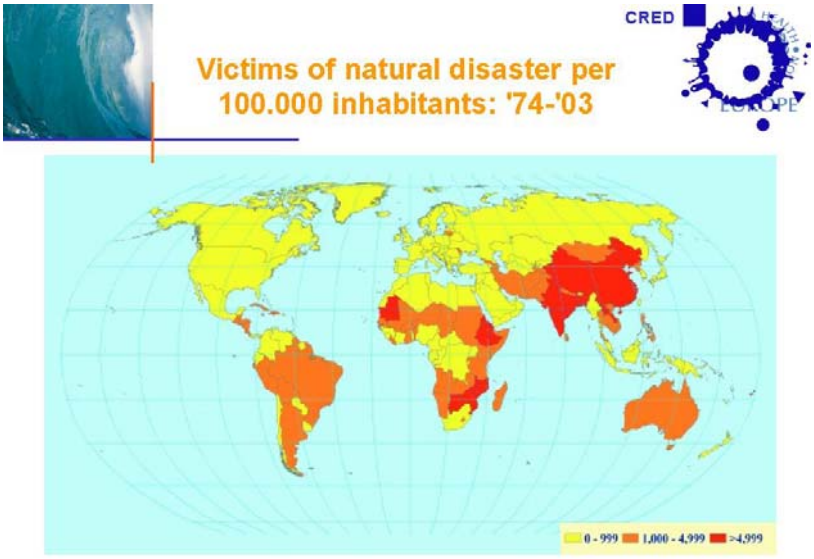
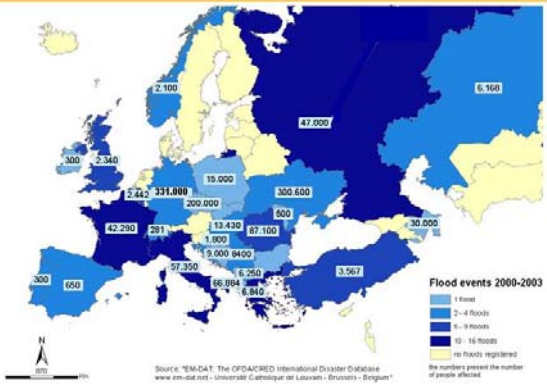



CRED
Humanitarian aid per victim:
1992-2003, in US $
0
100
200
300
400
500
US $
Wave (5)
Wildfire (7)
Volcano (3)
Earthquake (1)
Windstorm (2)
Extreme Temperature (8)
Slide (9)
Flood (6)
Drought (4)


CRED
Natural disasters: 1974-2003
0 - 29
30 - 119
>119

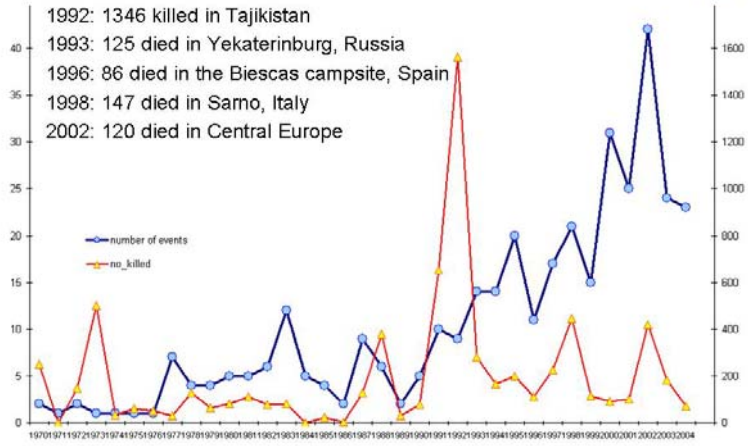

CRED
Victims of natural disaster per
100.000 inhabitants: '74-'03
0 - 999
1,000 - 4,999
>4,999

Flooding affects health in Europe



Year	2000	2001	2002	2003	2004	total 2000-2004
Events	31	25	42	24	23	145
Death	90	103	421	184	72	870
Affected	182,591	743,214	1,024,901	66,811	412,278	2,429,795

Flooding affects health in Europe



Source: "EM-DAT: The OFDA/CRED International Disaster Database, www.em-dat.net - Université Catholique de Louvain - Brussels - Belgium" Created on: May-23-2005. - Data version: v05.05 Wolf 2005

Flooding affects health in Europe

Immediate: death, injuries, hypothermia
Medium-term: gastro-intestinal infections and respiratory diseases
Long-term: mental health consequences

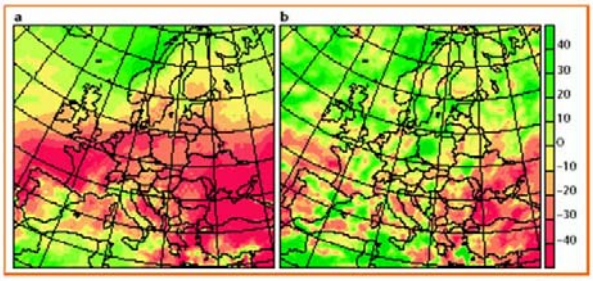
Direct effects:
Drowning, injuries,
health implications due to contact with (cold, polluted) water,
cardiovascular incidents.

Indirect effects:
- Waterborne infections;
- vector-borne diseases;
- food shortage;
- health effects of chemical pollution;
- decrease of health care and emergency service;
- psychosocial disturbances.

Menne 2000

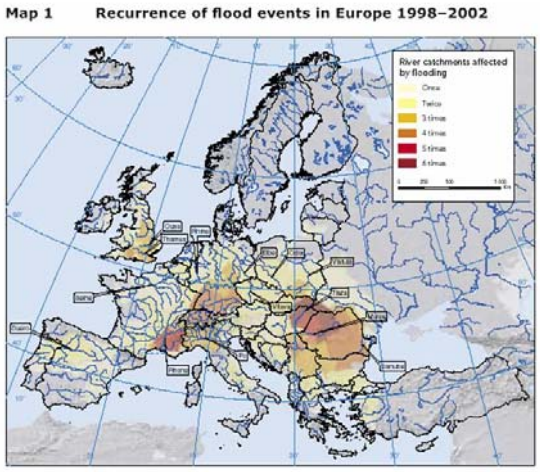
Risk of floods will increase

- Magnitude and frequency of floods are likely to increase;
- Impact of floods increases because more people live in areas at risk of flooding;
- Human activities contribute significantly to increasing the risk of floods.



Christensen et al 2003

Flood events can be mapped:



EEA 2005

Adapt to flooding by

Primary and secondary preventive measures:

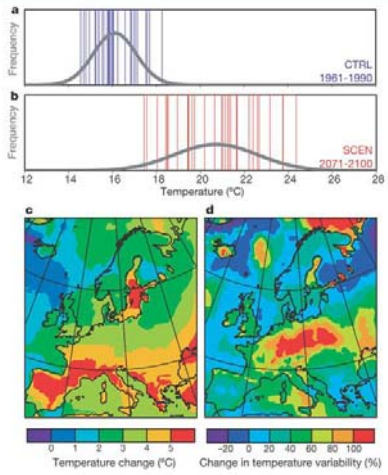
- Building codes, legislation to relocate structures away from flood-prone areas
- Planning appropriate land use
- Floodplains and flood-control structures
- Early warning systems with advice

Locally: better information, better warnings, post-event care

Research gaps have been identified

- Retrospective analysis of flood morbidity and mortality using routine data sources or pre-existing cohorts;
- Impacts of floods on European health care systems;
- Flood early warning systems, current effectiveness;
- Cost benefits of preventing injuries, deaths and morbidity from floods;

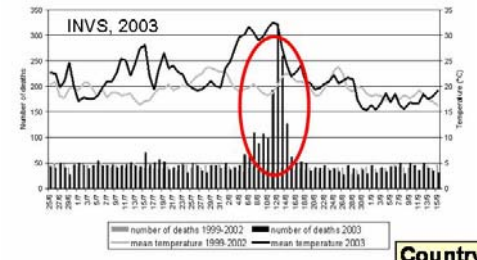
Heat is an emerging issue



Schaer et al 2004

- The hottest summers since 1880 occurred within the past 15 years;
- Heat-waves were registered in Europe 1976, 1981, 1983, 1987, 1995 and 2003;
- Extreme weather events occur more frequently.

Hot weather causes excess deaths



Country	Excess deaths
England and Wales	2045
France	14802
Portugal	2229
Spain	3166
Germany	1415
Switzerland	975

Wolf 2005, updated from : Kovats RS, *et al.* (2004). Heatwave of August 2003 in Europe: provisional estimates of the impact on mortality. *Eurosurveillance Weekly*, 8 (11).

Some risk factors are

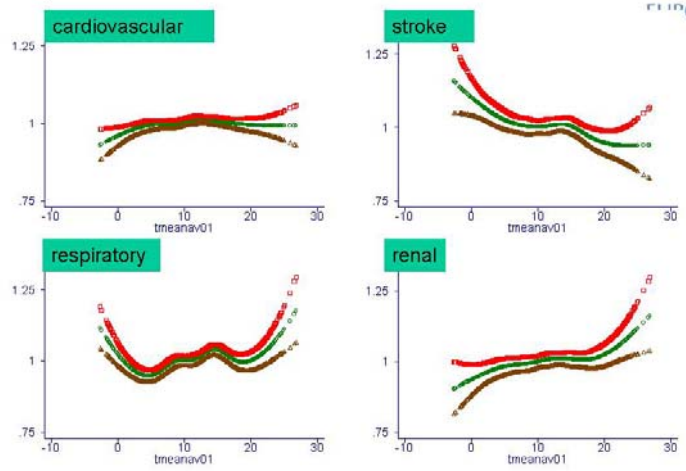
Individual:

- being over **60** (Keatinge, WR *et al.*, 2000; Basu, R. and Samet, 2002),
- suffering from **pre-existing illness**, especially heart and lung diseases;
- **mental illness** (Kaiser et al., 2001);

Social:

- working in jobs requiring **heavy labour** ,
- living in inner cities and **lower-income** census tracts, (Basu, R. and Samet, 2002);
- being exposed to **low economic status**, (Basu, R. and Samet, 2002);
- people with impaired health but also those suffering from poor social conditions are most susceptible to impact of weather changes (Ballester et al., 2003;O'Neill et al., 2003);
- Additional **behavioural risk factors** (Semenza *et al.*, 1996): living alone, being confined to bed, not being able to care for oneself, having no access to transportation, not leaving home daily, social isolation;

Relationship between temperature and emergency hospital admissions in London



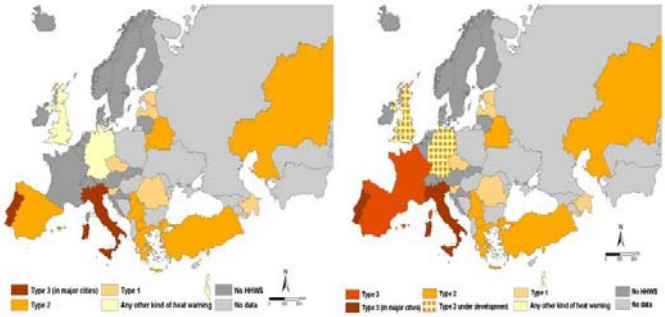
Why was France so badly affected?

- Temperature extreme
  - high minimum temperatures for a long time
- Surveillance
  - Delayed detection of the increase in mortality
- Institutional failures
  - Poor communication
  - Hospital/ care home staff on holiday
  - Lack of cooling facilities
- No experience/knowledge
  - no public health measures in place

Measures

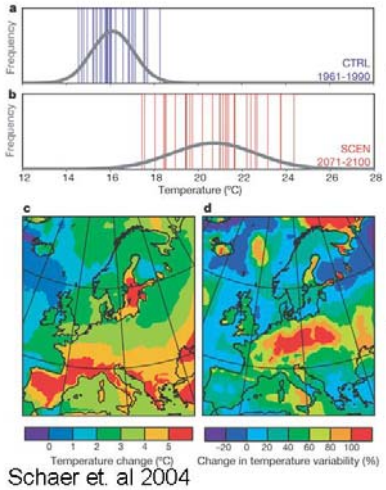
Purpose of measures	Strategies	Sector involved	Level	How does it work?
To reduce the urban heat island	Increasing green areas; Reduce building density; Maintain and improve ventilation paths through changing the layout and width of streets, orientation of streets in relation to prevailing winds	Public urban planning	Municipal /Regional	Increases, reflection of short-wave radiation; Reduces heating of urban structures by reducing heat release during night time and energy consumption Provides shade and cooling Allows cool air to enter the city and increase the wind speed
To reduce indoor heating of the buildings	Use of building materials with a high albedo and low heat storage capacity; High thermal insulation; Shading of the windows; Building compact houses with small surface areas of the walls for a given floor area Building orientation	Public urban planning, architecture, Private construction firms	Municipal and Private	Reduces solar heating of the building (max. difference of surface temperature between white and black roof: 40 K. Natural ventilation during night
To develop Heat health warning system	Meteo and public health offices development of a heat health warning system	Meteorological and health services-…	Municipal National	To warn the population and health care services some hours in advance
	Heat advice to the general public, medical staff and City managers on behavioural measures	Media Health care facilities, hospitals (national, municipal level)		Ensure preparedness and awareness of the problem to reduce exposure to heat
	Medical advice to patients	Health care staff		Prevent people from dehydration, control medical treatment, increase patient surveillance, etc
	Create a telephone hot line for advice	Local		Provide access to information
To protect the elderly	Systems to look after elderly	Health care facilities, hospitals (national, municipal level		To ensure that the vulnerable group has access to a cool environment and will take enough liquids
	Information of hospitals, nurseries etc.			To ensure that heat related morbidity is identified and treated in a appropriate way
	Education	Schools, media, health care facilities, families All levels		Ensure appropriate behaviour in case of extreme heat events (liquid intake, reduction of exposure to heat etc.)
	Adapt working hours to outdoor thermal environments (e.g. siesta)		National–firms	Reduce exposure to heat

Heat warning systems



Heat health warning systems before and after 2003

Heat is an emerging issue



Schaer et. al 2004

- Climate change includes warming and increasing climate variability
- Extreme weather events occur more frequently
- The hottest summers since 1880 occured within the past 15 years

Prevention is possible with

Actors
City planners
Unions
Housing developers
National Weather Service

Media/ network
Social services
Flyers
Neighbourhood meetings
Local TV and Radio
Internet

Physical action
Heat shelters
Changing roof Tops
Planting trees
Forecasting

Social action
Risk communication
Community heat education
Community "buddy" system

Thanks for your attention!

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http://www.euro.who.int/globalchange

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