### Health and Global Environmental Change SERIES, No. 2





## **Heat-waves:** risks and responses







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## Heat-waves: risks and responses

Lead authors:

Christina Koppe, Sari Kovats, Gerd Jendritzky and Bettina Menne **Contributing authors:** 

Jürgen Baumüller, Arieh Bitan, Julio Díaz Jiménez, Kristie L. Ebi, George Havenith, César López Santiago, Paola Michelozzi, Fergus Nicol, Andreas Matzarakis, Glenn McGregor, Paulo Jorge Nogueira, Scott Sheridan and Tanja Wolf







#### **Abstract**

High air temperatures can affect human health and lead to additional deaths even under current climatic conditions. Heatwaves occur infrequently in Europe and can significantly affect human health, as witnessed in summer 2003. This report reviews current knowledge about the effects of heat-waves, including the physiological aspects of heat illness and epidemiological studies on excess mortality, and makes recommendations for preventive action. Measures for reducing heat-related mortality and morbidity include heat health warning systems and appropriate urban planning and housing design. More heat health warnings systems need to be implemented in European countries. This requires good coordination between health and meteorological agencies and the development of appropriate targeted advice and intervention measures. More long-term planning is required to alter urban bioclimates and reduce urban heat islands in summer. Appropriate building design should keep indoor temperatures comfortable without using energy-intensive space cooling. As heat-waves are likely to increase in frequency because of global climate change, the most effective interventions, measures and policies to protect the health of vulnerable Europeans need to be developed and evaluated.

# Keywords CLIMATE GREENHOUSE EFFECTS HEAT STROKE - prevention and control RISK ASSESSMENT RISK MANAGEMENT INFORMATION SYSTEMS

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#### **Foreword**

This important publication, reviewing the effects of heat stress on health and potential strategies to reduce vulnerability to thermal stress, is the work of a strong collaborative team of investigators from several European countries. It is particularly timely given the high-profile effects of the heat-wave in France in 2003 that have reinforced the need for societies to cope more effectively with heat-waves.

The ageing of the European population, together with the potential effects of climate change, may exacerbate the threats to human health posed by thermal stress in the future. Heat-health warning systems offer the potential for collaboration between meteorological agencies and health authorities. However, merely issuing warnings is unlikely to substantially reduce heat-related deaths. Community outreach to vulnerable groups will be necessary, and the impact of such systems must be evaluated to ensure that they deliver the promise of reducing heat-related deaths. The challenge of reducing the effects of thermal stress, especially on elderly people, also requires commitment from policy-makers and building designers to improve indoor environments without using approaches that lead to increases in greenhouse gas emissions. Health researchers and those studying the built environment need to collaborate to determine cost-effective designs to reduce thermal stress.

This publication makes an important contribution to understanding of the effects of thermal stress and effective responses. It complements other work such as that on the health effects of floods and the effects of climate on infectious diseases that has been undertaken under the Climate Change and Adaptation Strategies for Human Health (cCASHh) project. The contributors to this publication are to be congratulated on marshalling existing evidence in an accessible form and indicating research questions that still need to be addressed.

Andy Haines
Dean
London School of Hygiene and Tropical Medicine
United Kingdom

#### **Foreword**

When the Climate Change and Adaptation Strategies for Human Health (cCASHh) project started on 1 May 2001, few people would have thought that its results would be so timely.

The heat-wave of August 2003 in Europe and its high toll of victims in various parts of Europe have made it clear once again that no one on this planet will remain unaffected by the effects of climate change. One heat-wave does not prove that the world is getting hotter, but last summer's weather fit a global trend that has seen previous records shattered with increasing regularity. Although the historical data for heat-waves may leave much to be desired, the August heat-wave in Europe has certainly broken all records for heat-induced human deaths.

This publication summarizes the findings of work package 3 of the project Vulnerability Assessment of thermal stresses. It shows that health care and social systems are ill prepared for thermal stresses and that intervention plans and effective technical intervention are lacking. The publication identifies the research gaps and formulates recommendations.

Relatively little research has been carried out on the effects of climate change on human health. This type of research requires an interdisciplinary approach. The cCASHh project is a good example. Coordinated by WHO, it comprises eight partners from six countries and brings together researchers from different disciplines.

Congratulations to all the participants for their hard work in producing this important and comprehensive publication.

Karin Zaunberger Project Officer Research Directorate-General European Commission

#### **Foreword**

Human beings are closely linked to the atmospheric environment via their heat budget. Extreme thermal conditions can harm the health of people with limited capacity for acclimatization, as was shown by the heat-wave that struck central, western and southern Europe in August 2003. Heat-waves appear to constitute a great health risk even in moderate climates.

Such extreme events are expected to occur again because of the natural variability of climate and the assumed climate change. Taking appropriate precautionary measures has thus become urgent. The key term is adaptation. The Climate Change and Adaptation Strategies for Human Health (cCASHh) project provides basic findings on the capacity of the population to adapt to extreme thermal conditions and has identified several strategies for reducing vulnerability. Heat health warning systems, with intervention measures adjusted to local conditions, can save lives in critical cases. Long-term goals should include reducing urban heat islands through climate-related urban planning and designing buildings to create favourable indoor climates without the use of air-conditioning. Maximizing the effectiveness of such adaptation measures requires intense multidisciplinary cooperation between experts in numerous fields.

Based on German Federal law, the Deutscher Wetterdienst carries out pure and applied research in public health. This is probably unique among national meteorological services, and the Deutscher Wetterdienst therefore plays an appreciated role in human biometeorology within the World Meteorological Organization. I am very happy to report that there has been close and fruitful collaboration between WHO, the London School of Hygiene and Tropical Medicine and the Deutscher Wetterdienst on this fundamental issue. I would like to thank the European Commission for funding this forward-looking research.

Udo Gärtner

President

Deutscher Wetterdienst

Permanent Representative of Germany with the World Meteorological Organization



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