

science summary



www.environment-agency.gov.uk

SCHO0807BNCX-E-P

The social impacts of heat waves

Science Summary SC020061/SR6

Cities may need to set up hot weather warning systems and public cooling centres as well as consider how building and urban space are designed and planned if heat waves become more frequent due to climate change, according to a new report by the Environment Agency.

The 2003 European heat wave revealed that society needs to prepare itself better to cope with extreme weather. This is particularly important given predictions of climate change and the likelihood of more frequent heat waves. To date, heat as a natural hazard has been largely ignored.

This report explores the health and social impacts of heat waves, the vulnerability of different social groups, and ways in which society could improve its response to extreme heat.

Heat waves, or periods of anomalous warmth, do not affect everyone; it is the vulnerable individuals or sectors of society who will most experience their effects. The main factors of vulnerability are being elderly, living alone, having a pre-existing disease, being immobile or suffering from mental illness and being economically disadvantaged or homeless. The synergistic effects of such factors can prove fatal for some.

Living in a city is another risk factor; during heat waves, because of an urban heat island effect, cities are usually much warmer than their rural environs. Non-English speaking communities and those without access to broadcast media may also be at a disadvantage, by missing out on warnings and advice issued by authorities once the hot weather has arrived.

Heat waves can have serious impacts on society including a rise in mortality, an increased strain on power, water and transport systems, and a possible rise in social disturbance. Critical infrastructures such as drinking water and electricity systems may fail under high demand, with power cuts greatly magnifying the number of people at risk. Emergency

staff and vehicles may be overwhelmed by the scale of an unfolding crisis – emergency staff may themselves become prone to heat stress as a result of overwork. The capacity of hospitals may soon be exhausted.

Adapting to more frequent heat waves should, where possible, avoid the widespread use of household air conditioning. Although air conditioning protects people from the adverse effects of heat, it consumes a large proportion of energy and contributes to anthropogenic heat emissions, enhancing the urban heat island effect.

Alternative measures that could be adopted include heat wave warning systems, telephone helplines and cooling centres, where air-conditioned public buildings are left open 24 hours a day. Guidance should be issued for those caring for vulnerable people at home or in elderly people's homes, hospitals, prisons and hostels. Warning systems should make use of informal methods of communication (for example, through religious groups, charities and word-of-mouth) as well as all forms of media.

The report recommends the following areas for research in the UK:

- explore the relationship between heat waves and social behaviour;
- evaluate the knock-on effects of failures in infrastructure, in particular, the consequences of a power cut leading to failure in transport and water systems;
- assess the interaction of extreme heat with other hazards such as air quality and in particular, water security for UK cities;
- explore the social processes leading to isolation and lack of information amongst vulnerable groups;
- examine possible strategies for social adaptation, in particular alternatives to private air conditioning such as greening of city space and the provision of public cooling centres;

- explore and assess the effectiveness of early warning systems.

This summary relates to information from Science Project SC020061/SR6 reported in detail in the following output(s):-

Science Report: SCHO0807BNCW-E-P

Title: The social impacts of heat waves

ISBN: 978-1-84432-811-6

August 2007

Internal Status: Released to all regions

External Status: Publicly available

Project manager: Kieron Stanley

Research contractor:

Centre for Environmental Assessment, Management and Policy (CEAMP)

Department of Geography, King's College London

This project was funded by the Environment Agency's Science Group, which provides scientific knowledge, tools and techniques to enable us to protect and manage the environment as effectively as possible.

Further copies of this summary and related report(s) are available from our [publications catalogue](#) on or our National Customer Contact Centre T: 08708 506506 or E: enquiries@environment-agency.gov.uk.

© Environment Agency