

MANAGING THE HEALTH EFFECTS OF CLIMATE CHANGE

5 Extreme Events

Climate change is not just an environmental issue—it is also a health issue. The major health threats due to climate change are caused by changing patterns of disease, water and food insecurity, vulnerable shelter and human settlements, extreme climatic events, and population growth and migration.

The UCL Lancet Commission on Managing the Health Effects of Climate Change

London's leading multidisciplinary university, UCL, has teamed up with the *Lancet*, one of the world's leading medical journals, to launch a joint commission to study and report on managing the human-health effects of climate change. Chaired by Professor Anthony Costello of the UCL Institute for Global Health, the commission's membership includes 24 academics from a wide range of disciplines varying from anthropology to mathematics.

For detail and references, please see 'The UCL Lancet Commission on Managing the Health Effects of Climate Change' published in the *Lancet*, Issue 373, May 2009 (Costello *et al*).

There is a direct link between climate change, extreme natural events and health, and health impacts are typically compounded by general infrastructure breakdown in water supply, sanitation and drainage. Weather-related disasters are expected to increase in number and severity due to climate change (see Box 1). For example, more extreme precipitation and tropical cyclones that trigger widespread flooding and serious loss of life are predicted. Associated health impacts can arise from the loss or contamination of potable water leading to disease as well as destruction of crops resulting in food shortages, poor nutrition and malnutrition.

In the longer term, post-disaster mental health conditions such as depression and anxiety can also present serious problems. Because of the intrinsically destabilising effects of extreme events, the social illnesses prompted by environmental uncertainty cannot be underestimated. Increased spending on appropriate counselling or sympathetic health promotion, and the initiation of such services in poorer countries, may turn out to be as important as provisioning to reduce new disease vectors.

An increase in the frequency and intensity of extreme meteorological events is inevitable. The increase in disasters triggered by extreme weather events reflects a true rise in the breadth and severity

of such events in recent decades (see Box 1, Box 2). Therefore, better modeling of the pace and spatial distribution of future changes and more thorough and sophisticated analysis of the demographic, social and economic trends that increase human vulnerability to hazards

Box 1: Natural Disaster Statistics in Relation to Climate Change

- From 1997 to 2007 more than 2 billion people were affected by natural disasters such as heat and cold waves, floods, droughts, windstorms.
- Between 2004 and 2006, 70 per cent of all natural disasters occurred in Asia, the Pacific region, Africa and the Middle East, where the most vulnerable populations reside.
- 2007 saw the highest number of significant natural disasters ever reported, a culmination of increases that have been seen since the 1960s. Over 90 per cent of disasters in 2007 were a result of extreme-weather or climate-related events.
- 80 per cent of the total US\$82 billion of disaster-related economic losses in 2007 were due to extreme-weather or climate-related events.

are required. Adaptation and mitigation require a new approach to how extreme events are managed, focusing on improved early warning, more effective contingency planning, identification of the most vulnerable and exposed communities and, in some cases, permanent resettlement.

Current knowledge of the health impacts of extreme events is limited by weaknesses in data collection and analysis. Looking ahead, two principal challenges can be identified: (1) expanding knowledge of the factors making populations vulnerable, through improved climate modeling and vulnerability assessments at the regional and local scale, and (2) identification of the most appropriate actions and approaches for reducing extreme-event disaster risk and consequently limiting resulting health impacts. For example, improved climate modeling will help to constrain future expectations of extreme meteorological events in terms of frequency, scale and temporal and spatial distribution. Satellite technology and improved communications can help to provide short-term alerts of windstorms and floods and early warnings of droughts and heat waves, permitting more effective emergency management planning and water resource and supply arrangements.

Box 2: Meteorological Extreme Events to Rise

- By 2100 India and Australia can expect summer temperatures to peak at more than 50°C, and South-West, Midwest and southern Europe will see summer temperatures frequently above 40°C.
- The failure to adapt will result in death rates comparable to the 70,000 toll from the 2003 European heat wave becoming commonplace.

The challenges of extreme events are only likely to be met successfully where disaster risk reduction is actively incorporated into social and economic development. Effectively addressing the increasing impacts of climate-change driven extreme events requires national governments to embrace the idea that the resulting 'natural' disasters are a function of the particular societal context within which these events take place, and the portfolio of economic, social and political-institutional factors that can and should be addressed by decision-makers. The application of technological innovations will also be required to improve climate modelling and vulnerability assessments of populations and land areas most at risk. Many developing countries lack the funds and expertise required to undertake major physical and structural measures, such as improved flood defences, protection of critical infrastructure, and modifications to housing construction. In many cases, however, lower-cost alternative technologies are applicable.

Educating the general public about the uncertain consequences of climate change and extreme events is no simple matter. Campaigns and programmes must be carried out with responsibility and care, and with recommendations for alternative forms of adjustment that are real and feasible. When governments attempt to educate populations about the consequences of extreme events by dramatising them, they may actually incite the very panic and hysteria their efforts seek to limit. For example, social psychologists have blamed the 'duck and cover' programmes of the US Cold War era for contributing to the presence of panic disorder amongst children of the baby boom, and such secondary psychological implications are rarely addressed by health practitioners.

Better co-ordinated responses by international agencies will help reduce the public health impacts of extreme droughts and floods. This, in turn, will ensure a more rapid return to normality. The Hyogo Framework for Action

2005–2015 (agreed by 168 governments at the 2005 UN World Conference on Disaster Reduction) is now being used to develop indicators for disaster resilience and risk reduction at national and local levels. So far, bilateral donors and international financial institutions such as the World Bank have begun to take disaster risk reduction seriously in their grant-making and lending practices, and some national governments have started to update pertinent legislation. Much of the burden of managing extreme events, however, falls on affected communities and local organisations. The ability to cope with extreme events at the local level is highly variable, and while community-based disaster risk reduction is widely promoted and practised, systematic analysis of its effectiveness remains limited.

To reach preparedness goals we must take a holistic disaster risk reduction approach while simultaneously addressing the ways in which initiatives are blocked or watered down by a lack of political will, insufficient funds or the absence of expertise or guidance.

Conclusions

- Climate change adaptation and mitigation are central to overall development policy across government departments and should be taken into consideration for all governance actions.
- Climate change will lead to an inevitable increase in the frequency and intensity of extreme meteorological events. There is a direct link between climate change, extreme natural events and health as health impacts are typically compounded by general infrastructure breakdown, for example in water supply, sanitation and drainage.
- Post-disaster mental health conditions such as depression and anxiety may present serious problems in the long-term.
- Accountability mechanisms are crucial. New funding and networks are required to monitor what is happening in government, civil society, academia, local government and communities, especially in the most vulnerable populations.
- Better co-ordinated responses by international agencies to extreme droughts and floods will help reduce the public health impacts of these events and ensure a more rapid return to normality.
- Individuals, organisations and governments all have a vital role to play in advocating for and implementing change at a variety of levels.
- Global task forces, research and advocacy groups need to adequately represent and involve those who will be most affected by climate change.
- Health issues can play a crucial role in strengthening carbon mitigation debates and targets.
- A comprehensive solution to the health problems associated with climate change will need to move beyond responses internal to health systems. Health systems must not simply act as a platform for the delivery of clinical services, but also provide the foundation for an effective public health response to the many climate-induced threats to health.

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Managing the health effects of climate change: Changing patterns of disease and mortality

Managing the health effects of climate change: Food

Managing the health effects of climate change: Water and sanitation

Managing the health effects of climate change: Shelter and human settlements

Managing the health effects of climate change: Extreme events

Managing the health effects of climate change: Population and migration

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