
Climate change and health

Report by the Secretariat

1. There is now a strong, global scientific consensus that warming of the climate system is unequivocal,¹ and is caused by human activity, primarily the burning of fossil fuels which releases greenhouse gases into the atmosphere. Already, evidence from around the world shows that global warming is changing rainfall and storm patterns, and disrupting the balance of natural systems that supply the necessities of life.

2. WHO has, for several years, stressed that the health risks posed by climate change are significant, distributed throughout the globe, and difficult to reverse. Recent changes in climate have had diverse impacts on health, such as the death of more than 44 000 people during the heat wave in Europe in 2003. Climate-sensitive risk factors and illnesses are currently among the most important contributors to the global burden of disease; these include undernutrition (estimated to kill 3.7 million people per year), diarrhoea (1.9 million) and malaria (0.9 million). Such conditions and other health outcomes will be increasingly affected by accelerating climate change through its adverse effects on food production, water availability and the population dynamics of vectors and pathogens; already, for example, evidence shows that higher temperatures are increasing the risk of malaria transmission in the East African highlands.

Summary

3. Climate change will affect, in profoundly adverse ways, some of the most fundamental determinants of health: food, air and water. The warming of the planet will be gradual, but the increasing frequency and severity of extreme weather events, such as intense storms, heat waves, droughts and floods, will be abrupt and the consequences will be acutely felt. The earliest and most severe threats are to developing countries, with negative implications for the achievement of the health-related Millennium Development Goals and for health equity. It is therefore essential to formulate a clear response in order to protect human health and ensure that it is placed at the centre of the climate debate.

¹ Intergovernmental Panel on Climate Change, Fourth Assessment Report. Climate change 2007: synthesis report. Summary for policymakers. Geneva, Intergovernmental Panel on Climate Change, November 2007 (unedited copy).

HEALTH ISSUES

4. The health sector, at international, national and subnational levels, has a responsibility, political leverage and staff with many of the necessary skills to protect the public from climate-related threats to health. Health professionals bring an understanding of primary prevention (analogous to strategies to mitigate climate change¹) and secondary prevention (analogous to measures for adapting to climate change²) to the discussion of how to reduce and prevent climate-related disease, injury and death. Key concepts that should be considered in designing responses include the following.

5. **Climate change threatens public health security.** Global warming is expected to pose direct threats to health by causing more severe storms, floods, droughts and fires, with consequent disruptions in water and food supplies and medical and other services. Higher temperatures will change the distribution, and increase the burden, of various vector-borne, foodborne and water-related infectious diseases. The worsening of air quality, particularly owing to ozone pollution, increases the prevalence of asthma and respiratory infections, the number of admissions to hospital, and days of work and schooling lost. Meeting increasing energy demands by greater use of fossil fuels will tend to increase the number of cases of these air pollution-related illnesses and all-cause and all-age premature deaths. Greater frequency and intensity of heat waves will increase mortality and the incidence of heat stress and heat stroke. Evidence shows that this is already occurring.

6. **Health impacts will be disproportionately greater in vulnerable populations.** Globally, people at greatest risk include the very young, the elderly, and the medically infirm. Low-income countries and areas where undernutrition is widespread, education is poor, and infrastructures are weak will have most difficulty adapting to climate change and related health hazards. Vulnerability is also determined by geography, and is higher in areas with a high endemicity of climate-sensitive diseases, water stress, low food production and isolated populations. The populations considered to be at greatest risk are those living in small-island developing states, mountainous regions, water-stressed areas, mega cities and coastal areas in developing countries (particularly the large urban agglomerations in delta regions in Asia), and also poor people and those unprotected by health services. A major concern is the fact that some African countries have a high burden of climate-sensitive diseases and poor public health capability to respond; the effects of climate change on socioeconomic development will seriously undermine health and well-being of people in such countries.

7. **Mitigating the effects of climate change can have direct and immediate health benefits.** A number of proposed mitigation strategies may improve health. For example, lessening the reliance on coal-fired generation of power will reduce air pollution, and associated respiratory and cardiopulmonary disease and death. Providing opportunities for the use of active transport (bicycling and walking) can also reduce levels of ambient air pollution, traffic-related injury and death, and obesity rates. Production and transport of food, especially red meat in developed countries, are major emitters of greenhouse gases. Eating foods that are grown locally, and those that are lower in the food chain (e.g. fruits, vegetables and grains) will help to reduce the risk of climate change and to lower risks of coronary artery disease, stroke, hypertension, obesity and diabetes.

¹ Mitigation in this context means action to reduce human effects on the climate system: principally strategies to reduce greenhouse gas emissions.

² Adaptation in this context means adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.

8. **Adaptation is needed because some degree of climate change is inevitable, even if greenhouse gas emissions were abruptly capped. Failure to respond will be costly in terms of disease, health-care expenditure and lost productivity.** Estimated direct and indirect health-care costs and lost income due to several environmental illnesses (e.g. those caused by air pollution) often match or exceed the expenditure needed to tackle the environmental hazard itself.

ACTIONS

9. The overarching goals for the international response to protect health from climate change are: (a) to ensure that concerns about public health security are placed at the centre of the response to climate change; (b) to implement adaptive strategies at local, national and regional levels in order to minimize impacts of climate change on the health of human populations; and (c) to support strong actions to mitigate climate change and to avoid further dramatic and potentially disastrous impacts on health. These goals can be achieved by working through existing public health frameworks with the following specific objectives.

10. **Raise awareness of the need to ensure public health security by acting on climate change.** Strong, evidence-based and consistent advocacy by the global health community will be needed to raise awareness that global public health needs to be protected from climate change. Such awareness raising will call for health-sector professionals to show leadership in supporting rapid and comprehensive actions, promoting mitigation and adaptation strategies that both improve health now and reduce future impacts of climate change. The case for public health security should be made more clearly in national and international processes that guide policy and resources for work on climate change, such as preparation of National Communications and National Adaptation Programmes of Action, and the global Nairobi work programme on impacts, vulnerability and adaptation to climate change, under the United Nations Framework Convention on Climate Change. WHO can support this objective through its own advocacy within and outside the United Nations system, and by providing guidance to Member States' health sectors on how to engage more effectively in the above processes.

11. **Strengthen public health systems to cope with the threats posed by climate change.** Increased investment in public health systems is already necessary in order to meet the health-related Millennium Development Goals, whose achievement will be further compromised by the impact of climate change. For this reason, additional system strengthening and forward planning will be required. Within this broad context, at national level the health sector should: (a) assess the potential impacts of climate change on health; (b) review the extent to which existing health systems can cope with the additional threat posed by climate changes, and (c) develop and implement adaptation strategies to strengthen key functions that already protect against climatic risks. This approach will need to encompass interventions within the formal health sector, such as control of neglected tropical diseases and provision of primary health care, and actions to improve the environmental and social determinants of health, from provision of clean water and sanitation, to enhancing the welfare of women. A common theme must be ensuring health equity and giving priority to protecting the health security of particularly vulnerable groups. WHO can provide technical support for building capacity to assess vulnerability and plan adaptive measures, and can mobilize and guide international support for the necessary strengthening of public health systems.

12. **Enhance capacity to deal with public health emergencies.** There is a particular need to strengthen systems to be able to respond to acute shocks associated with climate variability, including the health consequences of natural disasters, and more frequent, severe and wide-ranging epidemics.

WHO can assist this effort through existing international programmes on health action in crises, and disease surveillance, reporting and response.

13. **Promote health development.** National and subnational health agencies can promote health through assessment of the health implications of decisions taken in other sectors, such as urban planning, transport, energy supply, food production, land use and water resources. In this way, they can support those decisions that provide opportunities for improving health and at the same time reduce emissions of greenhouse gases that cause climate change; these opportunities include new investment in sustainable transport in developed and rapidly developing countries and in clean domestic energy in developing nations. WHO's role could be to provide technical guidance and adapt tools (such as cost-benefit analysis and health impact assessment) for global and regional assessments of the implications for health of policies in sectors such as energy, transport and water and sanitation.

14. **Enhance applied research on health protection from climate change.** Better evidence is needed of the effectiveness and efficiency of public health measures to protect health from climate change. Such activities require systematic, interdisciplinary applied research in Member States. WHO can assist by working with research bodies throughout the world to define and promote a common research agenda, and facilitating information exchange among countries.

15. **Monitor and evaluate delivery.** National and subnational agencies should improve identification and monitoring of the health status of vulnerable groups, and evaluate the effectiveness of interventions aiming to protect health better from climate change. WHO can support this work through technical guidance in many areas including design of indicators, and working closely with existing international mechanisms for monitoring progress towards attainment of the health-related Millennium Development Goals.

16. **Foster cross-disciplinary partnerships.** In order to ensure wide-ranging and effective mitigation and adaptation, Member States should build partnerships at the national and subnational levels, exploiting the expertise of government agencies, intergovernmental and nongovernmental organizations, and community, industry and professional groups for health protection. WHO can support this process at national and international levels through further development of the multisector and cross-disciplinary "healthy settings" approach (e.g. healthy homes, schools, public spaces and work places).

ACTION BY THE EXECUTIVE BOARD

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