

Executive Summary

The World Health Organization, the World Meteorological Organization, the United Nations Environment Programme, and the United Nations Development Programme organized an inter-regional workshop on Human Health Impacts from Climate Variability and Climate Change in the Hindu Kush-Himalaya Region. Held in Mukteshwar, India from 3rd to 7th October 2005, the objectives of the workshop were to:

- Inform government organizations, nongovernmental organizations and other relevant stakeholders about the impacts of climate variability and long-term climate change in mountain regions, and in the Hindu Kush-Himalaya region in particular;
- Identify specific human health risks linked to climate variability and change in the Himalayan mountain regions and identify vulnerable populations;
- Propose strategies for integrating health with relevant sectors (e.g. water resources, agriculture, forestry), interdisciplinary research and projects oriented towards action, and intercountry cooperation; and
- Achieve consensus on a draft framework for national action in the Hindu Kush-Himalayan mountain region.

National health and environment authorities were present from the Hindu Kush-Himalayan countries of Afghanistan, Bangladesh, Bhutan, India, Nepal, Pakistan, and the Peoples' Republic of China.

The participants discussed the global environmental changes that are projected to result in rapid and profound changes in the Hindu Kush-Himalaya region over the coming decades. The projected increasing temperatures and changing precipitation patterns due to climate change are likely to profoundly influence ecosystems and the human populations that depend on them in these regions.

There is scant published information available on the possible health consequences of global climate change in mountain regions. However, it is likely that vector-borne pathogens could take advantage of new habitats

in altitudes that were formerly unsuitable, and that diarrhoeal diseases could become more prevalent with changes in freshwater quality and availability. Excessive rainfall is likely to increase the number of floods and landslides. A risk unique to mountain regions is glacier lake outburst floods, which are projected to increase as the rate of glacier melting increases. These are associated with high morbidity and mortality. Because glaciers are the source of fresh water for many mountain regions and associated lowlands, the long-term reduction in annual glacier snowmelt is expected to result in water insecurity in both regions. The extent of the impacts will depend on the effectiveness of public health interventions and other adaptations.

The participants agreed that the basic issues that need to be addressed to assess the human health consequences of these changes include:

- (1) Identifying the current distribution of climate-sensitive health determinants and outcomes in the region, quantify the relationship between climate and health, and calculate the burden of these health determinants and outcomes (with special emphasis on the most vulnerable populations).
- (2) Identifying and evaluating the effectiveness of existing policies, awareness raising, and capacity building measures to reduce the burden of climate-sensitive health determinants and outcomes (adaptation baseline).
- (3) Review the implications for human health of the potential impacts of climate variability and change on other sectors.
- (4) Estimating future health impacts under different climate change and socioeconomic scenarios.
- (5) Identifying additional adaptation measures needed to reduce estimated future negative health effects; and
- (6) Identifying approaches to mitigate the emission of greenhouse gases by ensuring a stronger engagement of the health sector in the national, regional and global climate change negotiations, and by minimizing greenhouse gas emissions from the health sector itself (such as energy efficiency, alternative fuel supplies).

The workshop participants noted that while adaptive measures and interventions to protect human health from the consequences of climate change require immediate attention, mitigation measures, in the form of reduced emissions by all countries, are vital. Countries that have contributed the majority of greenhouse gas emissions should acknowledge their responsibility for generating climate change and consequent health impacts, reduce their emissions, and support mountain regions in adapting to climate change, to help ensure the long-term sustainability of mountain regions.

The participants made recommendations to address the following areas: data, research, and resource needs; policy; adaptation options; awareness and capacity building. The participants also agreed on the immediate steps to be undertaken at country level to facilitate the implementation of the framework contents. Further activities should focus on those populations and areas that are most vulnerable to climate-sensitive health determinants and outcomes.