

Perspective

Health risks of climate change in the World Health Organization South-East Asia Region

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Abstract

Countries in the World Health Organization (WHO) South-East Asia Region are particularly vulnerable to a changing climate. Changes in extreme weather events, undernutrition and the spread of infectious diseases are projected to increase the number of deaths due to climate change by 2030, indicating the need to strengthen activities for adaptation and mitigation. With support from the WHO Regional Office for South-East Asia and others, countries have started to include climate change as a key consideration in their national public health policies. Further efforts are needed to develop evidence-based responses; garner the necessary support from partner ministries; and access funding for activities related to health and climate change. National action plans for climate change generally identify health as one of their priorities; however, limited information is available on implementation processes, including which ministries and departments would be involved; the time frame; stakeholder responsibilities; and how the projects would be financed. While progress is being made, efforts are needed to increase the capacity of health systems to manage the health risks of climate change in South-East Asia, if population health is to be protected and strengthened while addressing changing weather and climate patterns. Enhancing the resilience of health systems is key to ensuring a sustainable path to improved planetary and population health.

Keywords: climate change, extreme weather events, health systems, infectious diseases, undernutrition

Projected impacts of climate change on health outcomes

Climate variability and change can affect the population burden of any health outcome whose occurrence and geographical range is affected by weather and climate variables, a rise in sea level, or ocean acidification. Changing weather patterns can affect the magnitude and pattern of morbidity and mortality from extreme weather and climate events and from changing concentrations of ground-level ozone, particulate matter and aeroallergens; can create environmental conditions that facilitate alterations in the geographical range, seasonality and incidence of climate-sensitive infectious diseases in some regions; and can affect the burden of undernutrition due to changes in water availability and agricultural productivity associated with a changing climate. This is particularly true in some parts of Asia.¹ In addition, mental health, migration and other factors affecting well-being can be affected by the consequences of a changing climate. While climate change will probably benefit some health outcomes in some locations in the short term, the overall balance will be detrimental, particularly in low- and middle-income countries that experience higher burdens of climate-sensitive health outcomes.¹ The pathways between climate change and health outcomes are often complex and indirect, making attribution challenging, as shown in Fig. 1.²

A recent study modelled the impacts of climate change on selected health outcomes in 2030 and 2050, under different

projected development scenarios.³ Table 1 summarizes the estimate for additional deaths due to climate change in south and south-east Asia in 2030, assuming a future world of mid-range emissions of greenhouse gases, very rapid economic growth, global population peaking mid-century and then declining, and rapid introduction of new technologies that emit fewer greenhouse gases.³

There are large uncertainties in these projections, inherent to projecting how climate could change over coming decades. All projections are statistically significant except for undernutrition, indicating that additional efforts are needed to ensure health systems are prepared to protect population health. Further, these projections are for only five selected health outcomes and there are many more climate-sensitive health outcomes whose prevalence is expected to increase with climate change.¹

Issues related to climate change and health risks in Asia

The *Fifth assessment report of the Intergovernmental Panel on Climate Change* notes that it is very likely that the mean annual temperature increased over the past century over most of Asia.⁴ It is likely that the numbers of cold days and nights have decreased, and the numbers of warm days and nights have increased since the middle of the 20th century. For most of south-east Asia, annual temperatures over the past 100 years

Fig. 1. Health risks of a changing climate

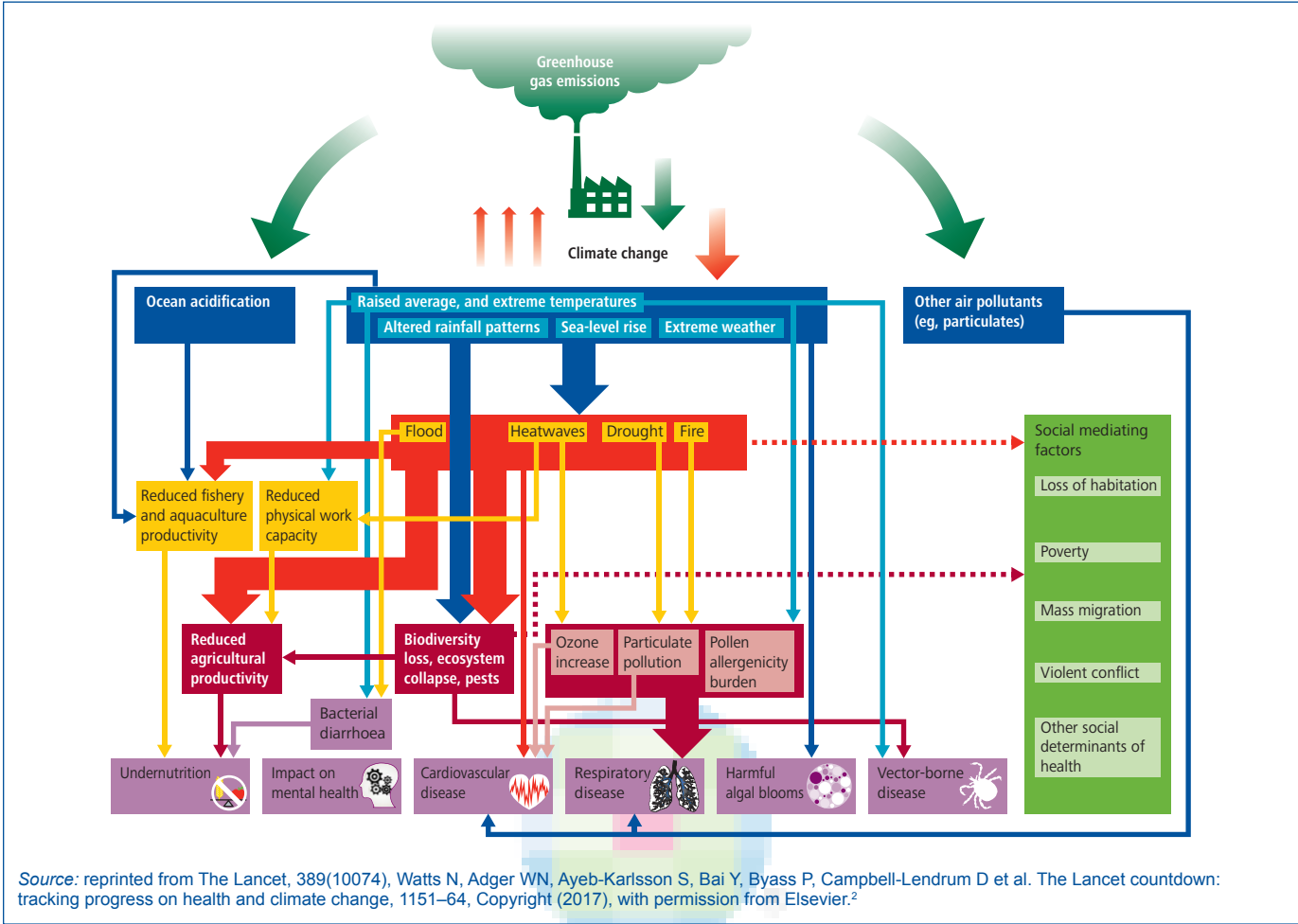


Table 1. Estimated additional deaths attributable to climate for selected health outcomes in 2030^a

Region	Undernutrition in children aged <5 years ^b	Malaria	Dengue	Diarrhoeal disease in children aged <15 years	Heat-related mortality in people aged >65 years
South Asia ^c	20 692 (–39 019 to 80 404)	1875 (1368 to 2495)	197 (101 to 254)	14 870 (6533 to 20 561)	9176 (7330 to 10 620)
South-east Asia ^d	3348 (–2635 to 9331)	550 (398 to 779)	0	765 (336 to 1105)	2408 (1629 to 3192)

^aData are mean (range) estimates, unless otherwise stated.

^bMean (±1 standard deviation) of the probability function of the impact estimates.

^cSouth Asia = Afghanistan, Bangladesh, Bhutan, India, Nepal, Pakistan.

^dSouth-east Asia = Cambodia, Indonesia, Lao People's Democratic Republic, Malaysia, Maldives, Myanmar, Philippines, Sri Lanka, Thailand, Timor-Leste, Viet Nam.

Source: Hales S, Kovats S, Lloyd S, Campbell-Lendrum D, editors. Quantitative risk assessment of the effects of climate change on selected causes of death, 2030s and 2050s. Geneva: World Health Organization; 2014.³

increased by approximately 0.6 °C per decade. The projected temperature for Asia in the middle and at the end of the century depends on the pathway for emission of greenhouse gases, with an upper estimate of more than 6 °C.⁴

The pattern for precipitation is more mixed and uncertain. Most areas of Asia lack sufficient observational records to determine trends in annual precipitation over the past century. Even with this uncertainty, heavy precipitation events are increasing and light rainfalls are decreasing. In south Asia, seasonal mean rainfall has declined, with more frequent deficit monsoons. Projected changes in precipitation are highly variable, with increasing and decreasing trends observed in different parts and seasons of Asia. Precipitation

extremes related to the monsoon are projected to increase in south and south-east Asia, with precipitation likely to become more extreme near the centres of tropical cyclones making landfall.⁴

An analysis of scientific and technical evidence on the impacts, adaptation and vulnerability of populations, completed as part of the *Fifth assessment report of the Intergovernmental Panel on Climate Change*, evaluated how patterns of risks and benefits are shifting due to climate change.⁴ Fig. 2 summarizes the key risks from climate change in Asia identified in this analysis and the potential for risk reduction through mitigation and adaptation. Levels of risk are presented for the near-term era of committed climate change (2030–2040), in which

projected levels of increase in global mean temperature do not diverge substantially across emission scenarios. Risk levels are also presented for the longer-term era of climate options (2080–2100), for global mean temperature increases of 2 °C and 4 °C above pre-industrial levels. For each time frame, risk levels were estimated for the current state of adaptation and for a hypothetical highly adapted state. Adaptation issues and prospects are indicated for each key risk. Relevant climate variables are indicated by symbols. The key risks for health identified include food insecurity, water shortage, flood-related injuries, malnutrition, infectious diseases, mental disorders, deaths and heat-related mortality. While adaptation can reduce health risks, considerable residual risks are expected by the middle and end of the century.

Activities related to climate change and health outcomes in the WHO South-East Asia Region

For more than 10 years, the World Health Organization (WHO) has been advocating, supporting and guiding Member States to address the impacts of climate change on health. In the WHO South-East Asia Region, regional meetings, high-level conferences and national meetings have been, and continue to be, conducted. Since climate change and its health effects are highly specific to the local context, country-specific features and determinants of the health risks of climate change have been a focus. Countries such as Bangladesh,⁵ Bhutan,⁶ Nepal,⁷ Indonesia⁸ and India (two districts)⁹ have carried out assessments of health vulnerability and adaptation. Regional and national training on the subject has been provided. Between 2010 and 2015, Bhutan implemented a health adaptation to climate change project, resulting in a permanent focus on climate change and health outcomes.¹⁰ New projects to adapt to climate change, focusing on resilient water and sanitation services, were started in Bangladesh and Nepal in 2013. Bangladesh, Bhutan, Nepal, Maldives and Timor-Leste have prepared National Adaptation Programmes of Action (NAPAs) and submitted them to the secretariat of the United Nations Framework Convention on Climate Change.¹¹ NAPAs provide a process for least-developed countries, as defined by the United Nations, to identify priority activities that respond to their urgent and immediate needs to adapt to climate change – those for which further delay would increase vulnerability and/or costs at a later stage. All countries have developed some sort of national plan and strategy for addressing the health risks of climate change.

Awareness of and capacity to manage climate-sensitive health outcomes in the WHO South-East Asia Region

In 2015, in 10 of the 11 countries of the WHO South-East Asia Region (the Democratic People's Republic of Korea was not included, for operational reasons), a review explored awareness levels and understanding of the capacity of health systems to prepare for and manage the health risks of a changing climate.¹² Interviews with 35 key informants in ministries of health, environment, agriculture, water resources, finance and treasury, planning, rural development and other related sectors strongly indicated that their

countries were vulnerable to weather events, and most agreed that these weather events would become severe in the next 25 years. The majority of stakeholders could nominate at least one climate-sensitive health outcome in their respective countries, and many accurately identified the full range of health outcomes of concern. Most stakeholders agreed that these health outcomes could increase over the next 25 years with climate change, although some noted that further research was needed to better understand the magnitude and pattern of possible increases in risks in their countries. There was some degree of optimism, with a small number of stakeholders indicating that effective health systems and programmes could reduce the health risks of a changing climate. However, there was a low level of awareness of measures being taken to address the health risks from climate change. Where key informants were aware of measures, most indicated that current measures are inadequate and that additional and supportive measures are needed to prepare for any projected changes in health burdens due to climate change. With support from the WHO Regional Office for South-East Asia, country ministries of health are working to incorporate climate change into national health policies and plans.

All countries demonstrated a large array of partnerships with different organizations, including meteorological and environmental ministries and organizations, which bodes well for future collaborations. Engagement beyond sectoral and organizational silos is mandatory, to be able to understand the multiple drivers of adverse climate-sensitive health outcomes and to effectively design and implement programmes to manage those risks. There are significant opportunities for improving population health now, by using the rich meteorological and environmental information being generated to, for example, develop early-warning and response systems to dengue¹³ and heat waves.¹⁴

Action plans for climate change, including NAPAs, of all the countries identified health projects as one of their priorities. However, there was generally very little information on crucial implementation processes, including (i) the people who were going to be involved as key implementers; (ii) the time frame of the projects; (iii) the responsibilities of different stakeholders; and (iv) how the projects were to be financed. Providing specifics on each of these issues is vital to monitor the progress and success of activities for climate change and health outcomes.

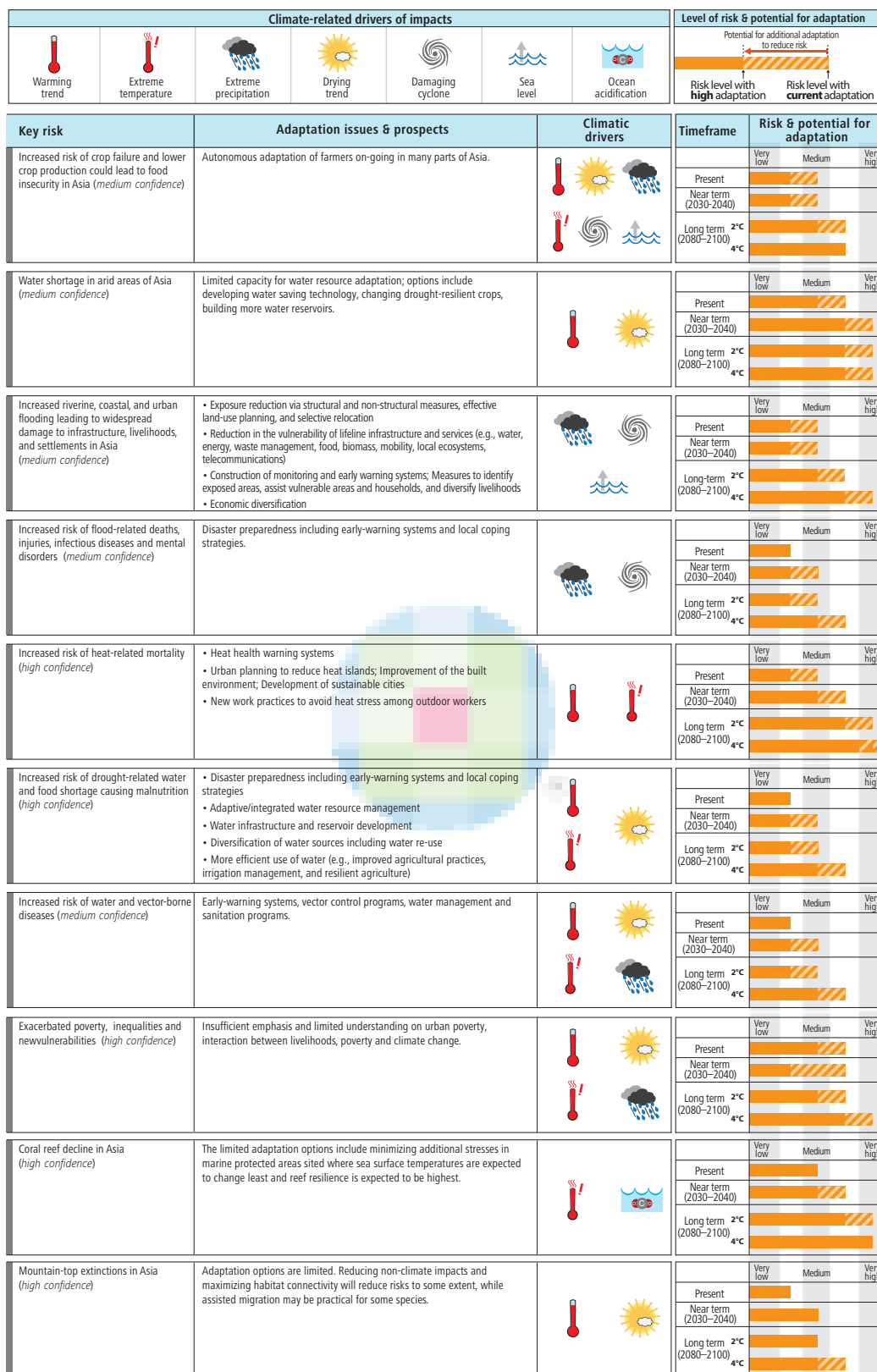
Urgent sourcing and securing of financial support, and subsequent implementation of prioritized projects for climate change and health outcomes identified in country plans, is a priority, in order to build resilience to the health risks of climate change in the region. Related to this is the gap in understanding at both country and regional levels of the main funding opportunities available, including the mechanisms for applying for such funding and associated time frames.

Lessons learnt and next steps

There have been many substantial advances in the activities of Member States of the WHO South-East Asia Region to respond to the health risks of climate change, particularly in relation to partnership building. These advances are promising

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Fig. 2. Key risks from climate change in Asia and the potential for risk reduction through mitigation and adaptation



Source: modified from Table 24.1 from Hijikawa Y, Lin E, Pereira JJ, Corlett RT, Cui X, Insarov GE et al. Asia. In: Barros VR, Field CB, Dokken DJ, Mastrandrea MD, Mach KJ, Bilir TE et al., editors. Climate change 2014: impacts, adaptation, and vulnerability. Part B: Regional aspects. Contribution of Working Group II to the Fifth assessment report of the Intergovernmental Panel on Climate Change. Cambridge and New York: Cambridge University Press; 2014:1327–70.⁴

and it is important to continue to support them. Many ministries of health and their staff in the region are pursuing activities for climate change and health outcomes with energy and enthusiasm. There are, however, areas for further support and investigation, including; (i) better understanding of how climate change and health outcomes can be linked with country-level activities related to the Sustainable Development Goals (SDGs);¹⁵ (ii) policy integration and framing; and (iii) monitoring, evaluation and learning. These challenges are briefly discussed next.

Linking with the Sustainable Development Goals

The signing of the SDGs in 2015 signalled an unprecedented international policy window for addressing global sustainability and human development.¹⁵ The SDGs differ from their predecessor – the Millennium Development Goals – in that they concern all countries (not just least-developed countries) and aim to comprehensively link human development goals and environmental sustainability under a single global agenda. The SDGs therefore provide an opportunity to synergize global efforts to tackle climate change and its health impacts, as well as providing the framework to do this in a manner that is collaborative among countries. The integral systems approach that the SDGs necessitates means that planetary health (human health and the natural systems that underpin it) can also link with and adopt this framework. In addition, global health efforts have the potential to be stronger if they can be connected to a process such as the SDGs, with clear targets, indicators and time frames.

Policy integration and framing

One clear policy lever to promote appropriate and effective responses to the health risks of climate change is the inclusion of climate change as a key consideration in national public health policies. Unless the health risks arising from climate change are clearly articulated in policies, it is difficult to (i) develop appropriate responses; (ii) garner the support from partner ministries (such as water, agriculture, etc.) for activities for climate change and health outcomes, the bulk of which are inherently cross-sectoral; and (iii) access funding for activities for climate change and health outcomes. Issues related to climate change have often been identified indirectly in public health policies, such as via disaster risk management and food security measures; however, it is imperative that these concerns are linked (where possible) to issues of weather and projected climate change. Unless this is clear, then there are likely to be many missed opportunities to coordinate and collaborate with such programmes to ensure policies and programmes promote health and well-being, and to seek joint adaptation funding. There is an opportunity here to encourage and bolster countries to explore different and culturally appropriate advocacy pathways for such policy integration to occur.

Monitoring, evaluation and learning

Indicators for monitoring, evaluation and learning (traditionally termed M&E) are needed, to assess and track over time the ability of health systems to prepare for and effectively respond to the health risks of a changing climate. M&E indicators can also facilitate identification of good practices for replication and scaling up, key barriers to progress, and enabling conditions.

This information can enhance understanding of the past performance of given activities and help ensure that future adaptation actions are appropriately designed and executed. Health systems have a long history of monitoring health-outcome-specific morbidity and mortality, and of identifying which individuals, communities and regions are particularly vulnerable to an exposure. What is different is that climate change is likely to change where and when cases of climate-sensitive health outcomes occur. Surveillance systems may need to be modified to ensure data are collected in new locations and at new times of year. In some countries, surveillance systems may need to begin collecting data on emerging or re-emerging threats. Doing so proactively will help to prevent outbreaks before they occur.

In addition to outcome indicators of climate-sensitive health outcomes, indicators are needed to monitor resilience to the health risks of climate change. It would be helpful to develop a common set of indicators for countries in the WHO South-East Asia Region, to track and facilitate quantification of the effectiveness of adaptation policies and measures over time. In addition, each country may have unique indicators to track specific issues of concern.

Conclusion

Gaps in preparedness to manage the health risks of climate change are evident in Member States of the WHO South-East Asia Region. At the heart of the challenges lies the importance of genuine collaboration, within and between health and related ministries, as well as across levels of governance (local to national) and types of organizations. Climate change and health outcomes is an issue that demands collaboration to develop the synergies needed to produce powerful responses. A variety of actors outside the public sector and the health sector already respond to the threats posed by climate change, and inclusive decision-making processes and policy and programme development will harness the energies of these important organizations.

Critically, climate change must be robustly included in health policies and planning processes, with detailed timelines and identification of the required human and financial resources and partners. For many countries, additional capacity-building on climate change is needed within their ministry of health, and within other ministries, on the health risks of climate variability and change. Opportunities should be promoted to improve the visibility and representation of the health sector on national- and regional-level working groups and committees for climate change. Reporting frameworks are needed to support all ministries to report on activities for climate change and health outcomes. Addressing these gaps would not only improve population health now but also increase resilience to a changing climate.

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