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Climate change brings natural disasters and disease



Jai P. Narain

9 September 2009 | EN The December 2004 tsunami created wide breeding grounds for mosquitoes

We must prepare for climate change bringing more natural disasters that favour mosquito-borne disease, says *Jai P. Narain* from the WHO.

Climate change has set in, with global temperatures projected to rise up to 4 degrees Celsius by 2100. Tropical cyclones will likely become more frequent and more intense, rainfall will increase and sea level may rise by up to nearly a metre as tropical sea surface temperatures increase.

Climate change is also expected to bring more natural disasters such as drought and flooding. Such changes will inevitably affect health, particularly in the developing world, leading to more deaths from heat stress, diarrhoeal diseases and malnutrition.

The incidence of mosquito-borne diseases, in particular, is likely to change.

In some tropical regions both cyclones and floods create breeding grounds for the mosquitoes that carry malaria and dengue. Poor populations in coastal areas are particularly vulnerable to sea level rise and the associated threat of mosquito-borne disease.

Rising disease

In South and South-East Asia, the last decade has brought many disasters, including devastating floods in the Indian states of Gujarat and Mumbai, super cyclones in India, Bangladesh and Myanmar and tsunamis affecting India, Indonesia, Sri Lanka and Thailand. How natural disasters affect mosquito-borne disease varies from region to region, depending on both the environment and how people live.

With the exception of the super cyclones, all these events exacerbated mosquito-borne diseases, particularly malaria. In India, the floods disrupted health service delivery and led to profuse breeding of mosquitoes, resulting in malaria outbreaks. Drought has also been found responsible for malaria outbreaks in Sri Lanka.

The December 2004 tsunami in the region similarly created wide breeding grounds for mosquitoes, disrupted health services and left over 1.6 million people without shelter. The result was a many-fold rise in malaria in the Andaman Islands from January to April 2005.

And Chikungunya, a disease that had all but been forgotten in India, has reappeared in southern parts of the country and by May 2007 had spread to almost all districts in Kerala. Though the igniting factors could not

be pinpointed, the underlying reason is the climate changes that helped *Aedes* mosquitoes breed and survive.

Time to learn lessons...

The UK's 2006 Stern Review on the economics of climate change emphasized that without mitigation and adaptive measures, the damage caused by climate change would be far more severe than simple economic costs.

But lessons can be learnt from past events. As a start, we must document our experiences with natural disasters — what worked and what didn't — to help guide future action. The malaria outbreaks in the Andaman Islands, for example, were controlled with extensive case detection and treatment, vector control measures and rehabilitation services.

The WHO Regional Office for South-East Asia is already analyzing the relationship between climate change and health, preparing research protocols to assess how climate change might affect communicable diseases like diarrhoea and cholera as well as mosquito-borne diseases, and to assess plans for preparedness. The WHO will test these protocols in Calcutta (India) and Thimphu (Bhutan) later this year, and is considering further studies in six or seven other countries in the region next year.

...and to get ready

Other researchers and policymakers should be taking similar steps. The information we have on the relationship between natural disasters, climate change and mosquito-borne disease is still only exploratory. We need more data. And better models. Global models do not help regional or country level assessments as they are too coarse. Individual countries must study data from past disease outbreaks and assess the likely burden of climate change effects on mosquito-borne disease, in terms both of additional areas at risk and population likely to be affected.

To create the political will needed to address climate change and mosquito-borne disease, we must also tackle the practical issues relevant to policymakers, including producing socioeconomic projections and cost estimates of adaptation measures compared with likely economic gains or losses due to climate change.

Countries also need other information to identify potential sufferers and evaluate current states of preparedness. They should be assessing existing health system infrastructure, identifying the latest intervention tools available and providing the resources required to combat the health consequences of climate change. Governments must establish local communities' capacity to cope so as to determine what additional inputs are needed.

With the right research, tools and political buy-in, regions like South and South-East Asia can prepare for any rise in mosquito-borne disease caused by climate change. But it will require concerted efforts to develop the research capacity needed for assessing the threat of climate change and modelling the implications for disease.

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