Threats to malaria elimination in the Himalayas

Kinley Wangdi and colleagues (May, 2016) warn of the importation of malaria from other countries as one of the potential threats to ongoing elimination efforts in Bhutan. We identified two additional challenges to malaria elimination in Bhutan and other Himalayan countries that are worthy of consideration.

First, temperature, precipitation, and vegetation phenology have changed rapidly in the Himalayas as part of global climate change. The average annual mean temperature in the region has increased by 1·5°C and precipitation by 163 mm in the past 25 years. A surge in temperature can lead to vector species spreading into new breeding habitats in high elevations and extend the transmission season for the disease. One study has shown that an increase in average temperature of 1°C is associated with a 25% rise in malaria incidence in the region. In Bhutan, malaria has been reported in seven of 20 dzongkhags (districts) in the southern plains, which comprised roughly 42% of the country’s population (753 947 people) in 2013. The remaining districts in the highlands also have an increased risk of transmission due to the changing climate.

Second, the growing population, which was traditionally dependent on millet, barley, and maize as staples in their diet, has developed an unsustainable appetite for rice, which puts pressure on rice production. As a result, growing numbers of dams are being constructed in rivers in the Himalayas to support irrigation and hydropower generation. In India’s mountainous north, 100 new dams have already been constructed. Ten additional dams are being built in neighbouring Bhutan. Another 400 dams are proposed for construction in India, Nepal, Bhutan, and Pakistan in the next two decades.

Ongoing construction of dams to support the ongoing dietary transition and rising energy demand is likely to increase the transmission of malaria, as seen in Africa.

In view of these additional threats, not just in Bhutan, but in the Himalayas in general, malaria elimination activities should be streamlined with climate adaptation and mitigation efforts. Identification of potential hotspots and addressing the environmental drivers of malaria transmission is crucial. To accomplish these aims, closer collaboration between the health and environmental sectors is needed. A systematic approach that focuses not only on the pathogen or the vector, but also on the broader physical and social environments that affect health and disease is urgently needed.

We declare no competing interests.

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