

HOW CLIMATE CHANGE WILL INFLUENCE INDIA'S MALARIA TRANSMISSION AND END MALARIA MANDATE

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Malaria continues to be a major threat to public health in India with around 1 million cases reported in the country each year. Another major crisis that exists not only in India but worldwide is climate change. Since the prevalence of malaria and its effects are greatly exacerbated by India's "extensive geographic and climatic diversity," it is important to discuss whether or not the changing of the climate will have an effect on Malaria transmission within the country.

According to a study done by researchers at the Indian Council of Medical Research-National Institute of Malaria Research, future climate change will affect temperature, rainfall and relative humidity which will subsequently effect "the spatial spread of *Plasmodium vivax* (Pv) and *Plasmodium falciparum* (Pf) malaria with a numerical increase in the transmission window's months, and a shift in the months of transmission." In addition, variations in temperature, rainfall and relative humidity will have an effect on the lifetime of the mosquito as well as its ability to develop vectors. Since there is a complex relationship between climate change and malaria, the topic should be included in the conversation about ending malaria in India.

A UN Chronicle article writes that climate change will threaten areas that are traditionally non-malarious as well as areas where the disease has been stifled, like high-altitude areas in the

Himalayas and other northern parts of India. An increase in temperature in these areas, which are traditionally free from devastating transmission rates of malaria, will be at risk for new developments of the disease. In the same article, research about the relationship between malaria shows that in areas where the disease is already most prevalent, an increase in temperature due to global warming will allow for the faster development of mosquitos. This will lead to faster transmission which will in turn make the disease a more pressing issue than it already is.

To put further risk on the mountainous northern region of India, an increase in rice demand has led to the construction of hundreds of new dams. An article in the Lancet Global Health journal writes that this demand and the need to support it through the construction of dams will lead to an increase in malarial transmission because of the increase of water reservoirs. The same was seen in sub-Saharan Africa.

It is clear that there are multiple factors that threaten malaria transmission and the fight to end malaria in India. As a multi-faceted issue, climate change poses a huge threat to the spread and development of the disease. To combat these problems, the UN Chronicle article writes about the elimination of malaria in Europe. New methods of farming, improved irrigation systems, changes in behavior, better access to quality healthcare as well as improved socio-economic state are all ways Europe was able to eradicate malaria while also fighting a changing climate. If the Indian government can tackle these issues, they may find solid paths to not only eliminating malaria but also avoiding a worsening in the disease due to the changing climate.

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