

Dengue fever and malaria in the Himalayas

September 25 2014



Due to climate change malaria transmitting mosquitos may be able to colonize mountain valleys of Nepal. Credit: Meghnath Dhimal

Research by Nepalese and German scientists from the Nepal Health Research Council, Goethe University and the LOEWE Biodiversity and Climate Research Centre analyzes the current situation of these diseases in the Himalayan country of Nepal and highlights how they profit from climate change and globalization.

Dengue fever: high risk, little knowledge

Although the first case of [dengue fever](#) in Nepal was only reported in 2004, the country was shaken by an epidemic already in 2010. In a study published in the journal *PLOS Neglected Tropical Diseases* the researchers report that the mosquito species that can transmit dengue virus have already colonized mountains and valleys of intermediate elevations in Nepal including the country's capital Kathmandu. Survey data from lowland and highland regions of Nepal, published in the journal *PLOS One*, show that local people know only very little about the disease: Although about 75% had previously heard of dengue fever, only a few knew how the virus is transmitted and which symptoms typically indicate dengue fever. While the majority had a positive attitude towards measures to prevent mosquito breeding, their practical implementation was very variable depending on the region. "Fifty percent of the total population of Nepal live in the warmer lowlands and are particularly vulnerable because there, mosquitos can breed more successfully. Interestingly, these people take less prevention measures than those in the highlands" says Meghnath Dhimal of the Nepal Health Research Council who conducted the studies as part of his PhD research as a scholar of the German Academic Exchange Service (DAAD) at Goethe University. "One explanation could be that mosquito nuisance only recently appeared in many highland areas of Nepal in the wake of global warming and better road communication. Thus, people there show a greater interest in controlling the dangerous newcomers," adds Dr. Ulrich Kuch, Head of the Department of Tropical Medicine and Public Health at the Institute of Occupational Medicine, Social Medicine and Environmental Medicine of Goethe University and an author of the studies.

Malaria: Imported cases as a challenge

In spite of a difficult political and economic environment, Nepal has made tremendous achievements to eliminate malaria during the last fifty

years, a study by the same team in *Malaria Journal* highlights: In the mid-1980s the number of malaria cases in Nepal was around 42,000 per year; this was reduced to around 2,000 cases in 2012 with only one reported death. This success is the result of new treatments, the distribution of insecticide impregnated mosquito bed-nets and access to free health services run by the state. However, significant challenges remain. The lead author of the study, Meghnath Dhimal, cautions that an outbreak of malaria may occur any time, even in low-risk areas, following severe changes in the ecology or extreme weather events and that there is a continuous rise in the numbers of imported cases of malaria. In addition, the risk of malaria transmission in the temperate regions may increase because global warming has more pronounced effects in the higher altitudes of Nepal.

Nepal's lessons for Europe



Researchers (lead author Meghnath Dhimal, to the right) interviewed inhabitants of the lowlands and highlands of Nepal as part of their survey on dengue fever. Credit: Meghnath Dhimal

Dengue fever and malaria are also of public health concern in Europe. Apart from [climate change](#) there are other similarities to Nepal such as localized [malaria](#) outbreaks in southern Europe, a rapid spread of exotic mosquito species that can transmit [dengue virus](#), and thousands of tourists per year who return home with the virus. "With respect to dengue fever we are concerned that infected travelers returning to areas where tiger mosquitoes are already common –this is a large part of Europe south of the Alps– might be bitten and then transmit the virus," concludes Dr. Kuch. Raising the awareness of medical staff and the general population about mosquito control and the transmission and symptoms of the diseases are now increasingly recognized as important in Europe; similar to the tasks that the researchers propose for Nepal.

More information: Dhimal, Meghnath et al. "Knowledge, attitude and practice regarding dengue fever among the healthy population of highland and lowland communities in central Nepal" (2014) – *PLoS ONE*, [DOI: 10.1371/journal.pone.0102028](https://doi.org/10.1371/journal.pone.0102028)

Dhimal, Meghnath et al. "Malaria control in Nepal 1963–2012: challenges on the path towards elimination" (2014) – *Malaria Journal*, [DOI: 10.1186/1475-2875-13-241](https://doi.org/10.1186/1475-2875-13-241)

Dhimal et al. "Spatio-Temporal Distribution of Dengue and Lymphatic Filariasis Vectors along an Altitudinal Transect in Central Nepal" (2014) – *PLOS One Neglected Tropical Diseases*, [DOI: 10.1371/journal.pntd.0003035](https://doi.org/10.1371/journal.pntd.0003035)

Provided by Senckenberg Research Institute and Natural History
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Citation: Dengue fever and malaria in the Himalayas (2014, September 25) retrieved 23 April
2024 from <https://medicalxpress.com/news/2014-09-dengue-fever-malaria-himalayas.html>

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