

Deforestation's effects on malaria rates vary by time and distance

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Deforestation may cause an initial increase in malaria infections across Southeast Asia before leading to later decreases, a study published today in *eLife* suggests.

The results may help [malaria](#) control programs in the region develop better strategies for eliminating malaria infections and educating residents on how to protect themselves from infection.

Mosquitos spread the malaria parasite to humans causing infections that can be severe and sometimes deadly. In the area along the Mekong river in Southeast Asia, many residents hunt or harvest wood in the surrounding forests, which can increase their risk of infection. Yet recent outbreaks of malaria in the region have also been linked to deforestation.

"As countries in the region focus their malaria control and elimination efforts on reducing forest-related transmission, understanding the impact of deforestation on malaria rates is essential," says first author Francois Rerolle, Graduate Student Researcher at the University of California San Francisco (UCSF), US, who works within the UCSF Malaria Elimination Initiative.

To better understand the effects of deforestation on malaria transmission, Rerolle and colleagues examined both forest cover data and village-level malaria incidence data from 2013-2016 in two regions within the Greater Mekong Sub-region.

They found that in the first two years following deforestation activities, malaria infections increased in villages in the area, but then decreased in later years. This trend was mostly driven by infections with the [malaria parasite](#) Plasmodium falciparum. Deforestation in the immediate 1-10-kilometer radius surrounding villages did not affect malaria rates, but deforestation in a wider 30-kilometer radius around the villages did. The authors say this is likely due to the effect that wider deforestation can have on human behavior. "We suspect that people making longer and deeper trips into the forest results in increased exposure to mosquitoes, putting forest-goers at risk," Rerolle explains.

Previously, studies on the Amazon in South America have found increased malaria infections in the first 6-8 years after deforestation, after which malaria rates fall. The difference in timing may be due to [regional differences](#). The previous studies in the Amazon looked at deforestation driven by non-[indigenous people](#) moving deeper into the forest, while communities in the current study have long lived at the forest edges and rely on subsistence agriculture.

"Our work provides a more complete picture of the nuanced effects of [deforestation](#) on malaria infections," says senior author Adam Bennett, Program Lead at the UCSF Malaria Elimination Initiative. "It may encourage more in-depth studies on the environmental and behavioral drivers of malaria to help inform strategies for disease elimination."

More information: Francois Rerolle et al, Spatio-temporal associations between deforestation and malaria incidence in Lao PDR, *eLife* (2021). [DOI: 10.7554/eLife.56974](https://doi.org/10.7554/eLife.56974)

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