

Climate Change Fueling Malaria in Kenya, Experts Say

Eliza Barclay in Tumutumu, Kenya
for [National Geographic News](#)

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Esther Njoki lay on a slender cot in the women's ward of Tumutumu Hospital, lucid for the first time in days after being ambushed by fever and delirium. The emaciated 80-year-old had survived a bout of malaria, but her doctor said it nearly killed her.

Malaria has long been endemic to [Kenya's](#) humid coast and swampy lowland regions, but it has only rarely reached Njoki's village on the slopes of Mount Kenya (see [Kenya map](#)).

In recent decades, however, scientists have noted an increase in epidemics in the region, as well as in sporadic cases like Njoki's.

Many medical and environmental experts attribute the spike in malaria to climate change, in the form of warmer temperatures and variations in rainfall patterns. (See a [map of global warming's effects](#).)

"We are now finding malaria in places that we did not expect to find it, particularly the highland regions that used to be too cool for malaria," said Dorothy Memusi, deputy director of the Malaria Division in Kenya's Ministry of Health.

Parasites, Mosquitoes Affected by Climate

Malaria is an infectious disease caused by parasites in the blood system. Symptoms include fever, severe joint pain, and in extreme cases, anemia—a deficiency in red blood cells—because the parasites use red blood cells to reproduce.

Changes in temperature can affect the development and survival of malaria parasites and the mosquitoes that carry them, according to a joint 2004 study by the State University of New York, Buffalo, and the Kenya Medical Research Institute.

Rainfall also influences the availability of mosquito habitats and the size of mosquito populations, the research found.

Shem Wandiga is a professor of chemistry at University of Nairobi who has studied the relationship between climate and malaria.

He said malaria epidemics first appeared in Kenya's highlands in the 1920s, but during the last 20 years, the frequency of outbreaks in the region has been more pronounced.

"The best climate conditions for malaria are a long rainy season that is warm and wet, followed by a dry season that is not too hot, followed by a hot and wet short rainy season," Wandiga said.

"Two to three months after that pattern, you see the onset of a malaria epidemic."

The recent outbreaks are particularly worrying because people have not built up immunity to the malaria parasite, according to K. M. Bhatt, an infectious and tropical disease specialist at the University of Nairobi.

"Epidemics are now more deadly, particularly for humans who do not have immunity and are taken by surprise when they're bitten," she said.

"[Patients] can get cerebral complications and lung and kidney failures if they do not get immediate treatment."

Wandiga noted that immunity to malaria develops over generations of people living with the disease.

"The second curse for highlanders who get malaria is their inability to access good medical facilities that would diagnose disease early enough and treat it," Wandiga added.

Other Causes?

While environmental and public health experts express alarm over the effects of climate change on malaria's spread, others are still skeptical of the role of climate in the epidemics in the East African highlands.

Bob Snow is a professor at the University of Oxford based at the Kenya Medical Research Institute-Wellcome Trust Research Program. He said that rising malaria rates are more likely the result of increased drug resistance in malaria parasites and the infrequent use of pesticides in mosquito breeding grounds.

Part of the Kenyan government's strategy to control malaria includes a renewed pesticide spraying program, the distribution of more than 3.4 million mosquito nets, and the use of combined-drug therapies called ACTs, he pointed out.

"Since 2000 there has been a precipitous decline in hospitalization from malaria [that is] coincidental with expanding [mosquito] net coverage and adoption of ACTs," Snow said.

(Read related story: "[Malaria Aid, Research Ramp Up to Tackle Africa Crisis](#)" [July 21, 2005].)

Wandiga countered that the Kenyan highlands have not experienced an epidemic in the last three years because weather conditions have not been conducive to mosquito propagation.

But he said he remains concerned that the region will continue to see health effects from climate change.

"We expect the frequency of diseases to increase and hence the need for early warning and early detection systems," he added.

"We need to improve health delivery services to communities to cope with these sudden increases."

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