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# Climate change is redrawing the malaria map in Africa, study finds

Malaria is the deadliest climate-sensitive infectious disease. Yet, researchers and public health officials have debated how climate change has shaped its spread. A new *Nature* study by an international team, including the University of Cape Town (UCT), resolved this debate, providing the most comprehensive assessment to date.

The study quantified climate change's historical and future impacts on children in sub-Saharan Africa, where most cases and deaths occur. It found that climate change has slightly increased malaria overall. Looking ahead, rising temperatures could increase malaria risk in southern and East Africa while reducing it where it is most rampant today, as it becomes so hot that even mosquitoes struggle to survive.

"Governments, health systems and communities must adapt to the evolving malaria threat," said co-author Dr Christopher Trisos, director of the Climate Risk Lab and principal research officer at UCT's African Climate and Development Initiative.

"That means getting ready now to implement more aggressive anti-malaria programmes in cooler regions of sub-Saharan Africa where malaria risk is growing, and which can be less experienced at tackling it. Inclusive economic development, and global health financing of effective surveillance, disease control and better healthcare will be crucial to help confront increased malaria rates caused by climate change in eastern and southern Africa."

Dr Trisos added: "We are seeing a notable increase in the number of children contracting malaria in Limpopo, Mpumalanga and KwaZulu-Natal due to human-caused climate change. By 2050, these provinces of South Africa are projected to see some of the largest increases in malaria risk from climate change in Africa. South Africa and its global health partners need to prepare local malaria control and health systems now for this growing risk."

The study found that climate change has slightly suppressed the spread of the disease in the warm, malaria hotspots of today and will continue to do so as it gets too hot for the disease to flourish, posing other human health threats. This is especially the case in many large West African nations (Nigeria, Burkina Faso, Mali), where climate change will reduce cases by 5%. In extremely hot Sahelian countries (Niger, Gambia, Guinea-Bissau, Somalia), the disease may actually be fully eliminated.

The opposite is true in cooler regions where malaria isn't a significant problem today, such as southern Africa and high-elevation East Africa. In these areas, climate change is slowly making temperatures more suitable for mosquito-borne malaria, increasing cases by 5% in the Ethiopian highlands (Kenya, Burundi) and by similarly large increases in Angola, Zambia and northeast South Africa. By 2100, the risk could increase by 20% in regions such as the Rift Valley and coastal southern Africa, creating new challenges for malaria control.

But efforts to reduce emissions can change this trajectory. If the world meets the 2°C warming threshold, it would avert five excess cases per 1 000 children in southern Africa and more in the East African highlands. It would also reduce the other widespread climate impacts that will be felt in central and western Africa as the planet continues to heat up. Further, while mitigation is crucial, so is adaptation. The southern and East African regions expected to be hit the hardest in the future are also regions that aren't accustomed to fighting the disease today.

"Our study shows that climate change's influence on childhood malaria risk is not uniform across Africa, underscoring the difficulty and complexity of adaptation and health planning across the continent," says Romaric Odoulami, co-author and researcher at the African Climate and Development Initiative.

"Climate change isn't just making malaria worse or better, it's moving it," said co-author Tamma Carleton, faculty head of research for the Climate Impact Lab and an assistant professor at the University of California, Berkeley. "Whether a place sees elevated malaria risks or reduced burdens under climate change depends on how hot it is today. We see relief in the current hotspots and new risk nearly everywhere else."

The authors make clear that both climate mitigation and adaptation actions, including malaria-elimination strategies, will be needed.

"Malaria was one of the first health outcomes linked to climate change, but it's taken a quarter century to be sure which direction things are headed," said co-author Colin Carlson, assistant professor of epidemiology at Yale University. "The big story here is the opportunity for action: so far, elimination efforts have counteracted climate change impacts by nearly 200-fold. Malaria elimination within a generation is not only possible, but one of the best ways to protect frontline populations from climate change impacts."

The study is the first of its kind to identify where adaptation investments to help prevent and control malaria will be most needed in the future. It is part of a larger effort by the Climate Impact Lab to help decision-makers target adaptation investments.

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***Issued by: UCT Communication and Marketing Department***

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