

First evidence of how the Asian malaria mosquito is spreading drug-resistant malaria in Africa

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A water storage facility in a village in Ethiopia, a structure targeted by the Asian malaria mosquito (*Anopheles stephensi*). Credit: Dr Luigi Sedda

Research by Lancaster University has led to the discovery of the role

played by the Asian malaria mosquito (*Anopheles stephensi*) in the spread of drug and diagnosis-resistant malaria in Africa.

Malaria is caused by a parasite that is spread by the bite of blood-sucking mosquitoes. According to the WHO, there were an estimated 247 million cases of [malaria](#) worldwide in 2021, with over 600,000 deaths, mainly in Africa. Children under 5 accounted for about 80% of all malaria deaths in the region.

Following its first detection in Djibouti in 2012, the Asian malaria mosquito *Anopheles stephensi* spread to the Horn of Africa (Ethiopia, Sudan, Somalia, and Eritrea) and beyond (Yemen, Nigeria, Kenya, and Ghana) at a speed unknown before for similar species.

People in households/dormitories with *An. stephensi* positivity had a 270% higher risk of malaria infection than those in households/dormitories where *An. stephensi* was not detected.

In addition, two other biological threats for controlling malaria were identified: [drug resistance](#) and diagnostic resistance of the parasite.

Dr. Luigi Sedda from the Lancaster Ecology and Epidemiology Group at Lancaster University Medical School is a joint first author on the paper which is [published](#) in *Nature Medicine*.

He said, "This is a very important finding. The mosquito that has spread in the Horn of Africa from Asia drove a major urban malaria outbreak in Ethiopia. *An. stephensi* is posing important public health concerns due to the increase in geographical presence, the capacity to persist throughout the year and to resist current insecticides, and to transmit drug and diagnostic resistant parasites."

The capacity of *Anopheles stephensi* to use manmade water storage

containers, which are abundant in rapidly expanding African urban settings, coupled with its unique ecology, behavioral plasticity, and resistance to major insecticides, makes it unamenable to conventional mosquito control tools.

This latest evidence can change the prospects of malaria control and elimination in the face of any future intervention that ignores the presence of this invasive species.

Dr. Sedda concluded, "The epidemiological characteristics of *An. stephensi* driven malaria can challenge the expectations for the new malaria vaccines to reduce the burden of malaria disease and deaths in Africa, the continent that was already highly hit by malaria and where successes in malaria reduction are currently stalled."

More information: Tadele Emiru et al, Evidence for a role of *Anopheles stephensi* in the spread of drug and diagnosis-resistant malaria in Africa, *Nature Medicine* (2023). [DOI: 10.1038/s41591-023-02641-9](https://doi.org/10.1038/s41591-023-02641-9)

Provided by Lancaster University

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