ANOPHELES STEPHENSI IN AFRICA.
AN OVERVIEW

An. stephensi is an international biological threat and could halt or even reverse progress made on malaria control and elimination in Africa over the last two decades

To ensure investments in global malaria are resilient against shocks, the global challenge of *An. stephensi* as an invasive species must be addressed

- ***Anopheles stephensi*** is an invasive malaria mosquito on the African continent. In its native range it is found in South Asia and the Arabian peninsula
- It was first detected in **2012** in **Djibouti**
- In **2016** it was detected in **Ethiopia** and **Sudan**
- In **2019** it was detected in **Somalia**
- In **2020** *An. stephensi* was detected outside of the Horn of **Africa** in **Nigeria**
- In **2022** the species was detected in **Kenya**

In Ethiopia *An. stephensi* has been shown to be resistant to all adult mosquito insecticides used in malaria control **organophosphates, pyrethroids, carbamates** (Balkew et al. 2021)

An. stephensi is a competent vector of both ***Plasmodium falciparum*** **and** ***P. vivax***

In **2022** WHO launched an initiative to stop the spread of *An. stephensi* through: collaboration, enhanced surveillance, information exchange, guidance development, and research.

Habitats that *An.stephensi* larvae use

Unlike other African primary malaria vectors (mosquitoes) that use natural breeding sites like rice paddies and puddles, *An. stephensi* can also thrive in artificial containers like

wells, cisterns, and water storage towers

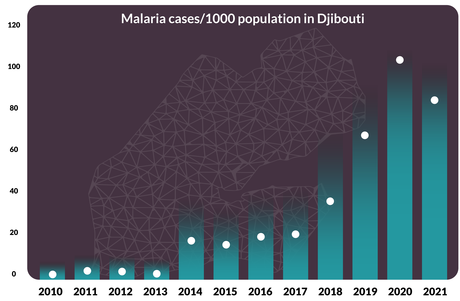
making it better suited to urban environments

Photo Credit: Lauren Bishop

This means that *An. stephensi* could shift malaria in Africa from a rural to an urban disease which could halt or reverse progress made in global malaria control and elimination

If *An. stephensi* continues to spread throughout Africa, an additional 126 million people will be at risk of malaria (Sinka et al. 2020)

Field surveillance in Ethiopia shows overlap between confirmed and predicted suitable habitats for *An. stephensi*.



In 2011, Djibouti was progressing toward malaria elimination, with **<2,000 cases reported per year.**
Malaria cases in Djibouti have since increased over 30-fold, with **73,535 confirmed cases in 2020 alone.** From 2018 to 2020, the number of suspected malaria cases jumped from **104,000 (2018) to 214,000 (2019) to 310,000 (2020).**

Unlike other African malaria vectors that are often sampled using adult collection methods, **larval surveillance** is the best tool for *An. stephensi*

An. stephensi is thought to be transported along major transport routes and is often found in seaports and dry ports

In Ethiopia the invasive populations of *An. stephensi* seem to have originated in Pakistan and are likely the product of at least two independent introductions (Carter et al. 2021)

An. stephensi is often found in livestock shelters or close proximity to livestock and it is known to feed on animals (cattle, goats, etc.) when they are present, but in the absence of livestock, such as in urban environments, they readily feed on humans (Balkew et al. 2021)

A modeling study extrapolated *An. stephensi* data from Djibouti to Ethiopia, predicting a **50%** increase in *P. falciparum* malaria annually, which would cost **$72 million USD** annually in vector control (Hamlet et al. 2022)

When compared to endemic vector *An. gambiae*, more of Africa is suitable for malaria transmission by *An. stephensi* based on thermal thresholds (Villeba et al. 2022)