

# Towards understanding indoor and outdoor malaria transmission in Malawi

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## Background

- Malaria is a leading public health problem in Malawi vectored by *Anopheles funestus*, *An. arabiensis* and *An. gambiae* s.s. mosquitoes<sup>1</sup>.
- LLINs and IRS have been proven to be effective, but their impact is threatened by insecticide resistance which is widespread in Malawi
- Impact of vector control tools may be made worse by concurrent alteration in the behaviour of vectors so that they avoid interventions by biting and resting outdoors and feeding on non-human blood meal sources, which could sustain residual malaria transmission.
- There is a dearth of information on vector species specific behaviours in endemic areas in Malawi.
- A better understanding of behaviours of malaria vectors is crucial to determine the specific roles of species in indoor and outdoor malaria transmission in the context of malaria control.
- The proposed study aims to fully characterize host seeking, feeding and resting behaviours of *Anopheles* malaria vector species in Dedza and Chikwawa districts of Malawi

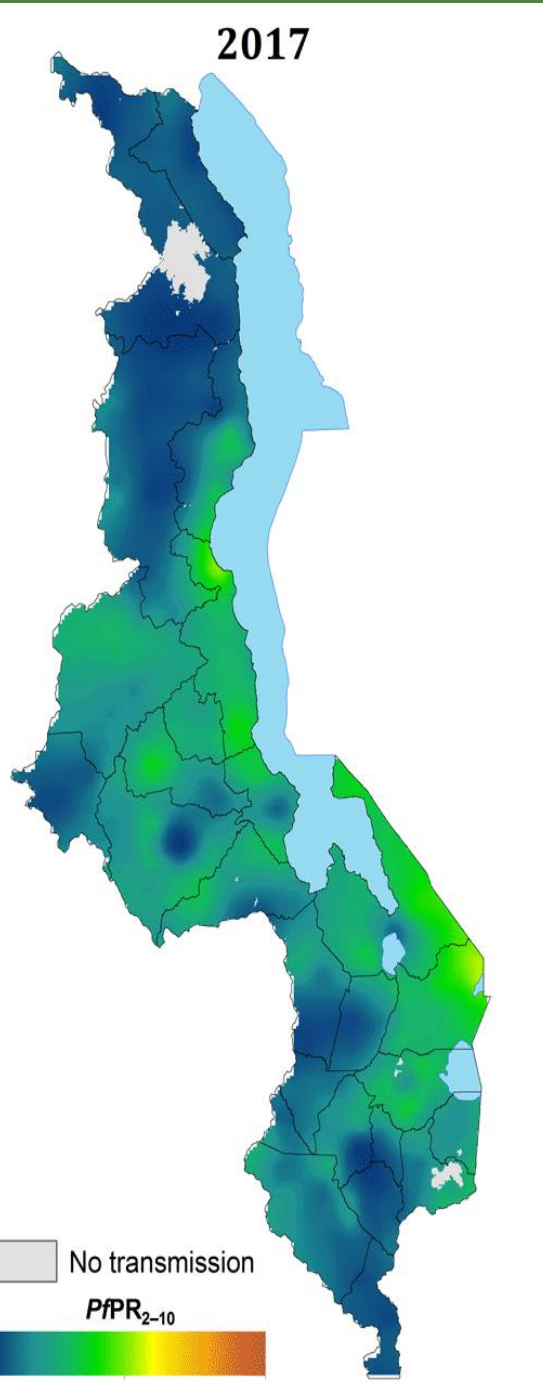


Fig 1. Mean standardized *Pf* parasite rate for 2017<sup>2</sup>

## Methods



Longitudinal entomological surveys will be carried out for a period of 12 months in the two study sites. Mosquito surveys using CDC light traps will describe vector population and ecology within the peridomestic environment.



Human landing catch studies will be conducted to quantify indoor and outdoor sporozoite rates, biting rates and entomological inoculation rates.



Backpack aspirators to capture blood-fed resting mosquitoes indoors and blood meal analyses conducted to determine mosquito host preferences.



Barrier screens will be used to capture resting mosquitoes outdoors. Blood meal analyses will be conducted on blood-fed resting mosquitoes to determine mosquito host preferences.



Hourly mean biting rates recorded during human landing catches and hourly proportion of time residents spend indoors and outdoors will be used to calculate indices of human exposure to malaria transmission.



A household-based questionnaire survey will be carried out to quantify the amount of time residents spend indoors and outdoors during times when malaria mosquitoes are active.

## Potential impact

The study will contribute to a better understanding of malaria epidemiology and species-specific vector behaviour in areas under intensive vector control for proper implementation and improvement of vector control strategies in Malawi.

## References

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