






RESEARCH ARTICLE

Entomological determinants of malaria transmission in Kayin state, Eastern Myanmar: A 24-month longitudinal study in four villages [version 1; referees: awaiting peer review]

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Abstract

Background: The Thailand-Myanmar borderland is an area endemic for malaria where transmission is low, seasonal and unstable. The epidemiology has been described but there is relatively few data on the entomological determinants of malaria transmission.

Methods: As part of a pilot study on Targeted Malaria Elimination, entomological investigations were conducted during 24 months in four villages located in Kayin state, Myanmar. *Anopheles* mosquitoes were identified by morphology, and molecular assays were used in order to discriminate between closely related sibling species of malaria vectors. *Plasmodium* infection rate was determined using quantitative real-time PCR.

Results: The biodiversity of *Anopheles* entomo-fauna was very high and multiple species were identified as malaria vectors. The intensity of human-vector contact (mean human-biting rate= 369 bites/person/month) compensates for the low infection rate in naturally infected populations of malaria vectors (mean sporozoite index= 0.4 and 1.7 /1,000 mosquitoes for *P. falciparum* and *P. vivax* respectively), yielding intermediary level of transmission intensity (mean entomological inoculation rate= 0.13 and 0.64 infective bites/person/month for *P. falciparum* and *P. vivax*, respectively). We estimated that 65% of the potential infective bites are not prevented by mosquito bed nets because of outdoor and early biters.

Conclusion: This study provided a unique opportunity to describe the

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entomology of malaria in low transmission settings of Southeast Asia. Our data are important in the context of malaria elimination in the Greater Mekong Subregion.

Keywords

Anopheles, human biting rate, sporozoite index, entomological inoculation rate, parasite load, residual transmission, Plasmodium juxtanculare, zoophagy index.



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