

POSTER PRESENTATION

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Consistently high baseline estimates for the proportion of human exposure to rural African malaria vector populations that occurred indoors

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Background

Insecticide treated nets (ITNs) and indoor residual spraying (IRS) are highly effective options for controlling malaria transmission in Africa because the most important vectors, which are from the *Anopheles gambiae* complex and the *An. funestus* group, prefer biting humans who are indoors at night. It is feared that sustained large scale use of ITNs and IRS can cause these vectors to shift biting in place and time where ITNs and IRS are not effective.

Materials and methods

Matched surveys of mosquito and human behavior from six rural sites in Burkina Faso, Tanzania, Zambia, and Kenya with ITN coverage ranging from 0.2% to 82.5% were used to calculate the proportion of human exposure to *Anopheles gambiae* sensu lato and *An. funestus* s.l. that occurs indoors (π_i) as an indicator of the maximum level of personal protection that ITN use can provide. The proportion of mosquitoes caught indoors (P_i) and between the first and last hours when most people are indoors (P_{fl}) were also calculated as underlying indicators of vector preference for feeding indoors or at night, respectively.

Results

The vast majority of human exposure to *Anopheles* bites occurred indoors ($\pi_i = 0.90-1.00$). Neither *An. gambiae* s.l. nor *An. funestus* s.l. strongly preferred feeding indoors ($P_i = 0.46-0.63$ and $0.22-0.72$, respectively) but they overwhelmingly preferred feeding at times when most humans were indoors ($P_{fl} = 0.84-1.00$ and $0.93-0.99$, respectively).

Conclusions

These quantitative summaries of behavioral interactions between humans and mosquitoes establish baseline values against which behaviour observed in residual vector populations exposed to high ITN or IRS coverage can be compared. Longitudinal monitoring of these quantities is vital to evaluate the effectiveness of ITNs and IRS and to evaluate the need for development of complementary measures targeting the outdoor-biting vectors.

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