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Abstract

Background: Long lasting impregnated nets (LLINs) are the most common and successful method of malaria vector control in Africa. However, the continued success of this approach is being threatened by the emergence of insecticide resistance and/or behavioural changes in vector populations that reduce their contact with LLINs. Insecticide resistance has now been detected in malaria vectors throughout Africa, with high levels occurring in Burkina Faso. Understanding the consequences of resistance for malaria control programmes is crucial in this context. We aim to characterise the ecology, population dynamics, biting and resting behaviour, and transmission potential of insecticide-resistant malaria vectors during a longitudinal study in Burkina Faso.

Methods: Since September 2016, we initiated a 3-years longitudinal malaria vector surveillance within 12 villages of south-west where insecticide resistance levels are high. Malaria vectors were collected two days per month at each village. Host-seeking mosquitoes were collected indoor and outdoor from 7pm to 6am using the gold standard of Human Landing Catch (HLC) and the Mosquito Electrocuting Trap (MET), a novel exposure-free alternative method. Resting bucket traps were used to sample vectors resting in and out of houses. Here are described the first 4-months results.

Results and discussion: We collected 8252 *Anopheles sp* from all 12 villages with 87.90% being *An. gambiae sl*. The abundance of host-seeking malaria vectors varied significantly between sites; ranging from less than 1 bite per person/night to a maximum of ~60 bites per person/night. Typically considered to be indoor biters, 56.1% of *An. gambiae sl* was found biting outdoor; indicating they may exhibit behavioural avoidance strategies that limit their contact with LLINs. The sampling sensitivity varied between inside and outside. The MET is collecting fewer mosquitoes relative to HLC regardless of trap position but performed well with an efficiency of 54% indoor and 70% outdoor compared to the HLC.

Conclusion: We found a high degree of outdoor biting in the vector population. Longer-term investigation and analysis are underway that will further explore how insecticide resistance and behavioural phenotypes are impacting vector control and the final results are expected current 2019.

