Screening mosquito house entry points as a potential method for integrated control of endophagic filariasis, arbovirus and malaria vectors.

BACKGROUND:

Partial mosquito-proofing of houses with screens and ceilings has the potential to reduce indoor densities of malaria mosquitoes. We wish to measure whether it will also reduce indoor densities of vectors of neglected tropical diseases.

METHODOLOGY:

The main house entry points preferred by anopheline and culicine vectors were determined through controlled experiments using specially designed experimental huts and village houses in Lupiro village, southern Tanzania. The benefit of screening different entry points (eaves, windows and doors) using PVC-coated fibre glass netting material in terms of reduced indoor densities of mosquitoes was evaluated compared to the control.

FINDINGS:

23,027 mosquitoes were caught with CDC light traps; 77.9% (17,929) were Anopheles gambiae sensu lato, of which 66.2% were An. arabiensis and 33.8% An. gambiae sensu stricto. The remainder comprised 0.2% (50) An. funestus, 10.2% (2359) Culex spp. and 11.6% (2664) Mansonia spp. Screening eaves reduced densities of Anopheles gambiae s. l. (Relative ratio (RR) = 0.91; 95% CI = 0.84, 0.98; P = 0.01); Mansonia africana (RR = 0.43; 95% CI = 0.26, 0.76; P<0.001) and Mansonia uniformis (RR = 0.37; 95% CI = 0.25, 0.56; P<0.001) but not Culex quinquefasciatus, Cx. univittatus or Cx. theileri. Numbers of these species were reduced by screening windows and doors but this was not significant.

SIGNIFICANCE:

This study confirms that across Africa, screening eaves protects households against important mosquito vectors of filariasis, Rift Valley Fever and O'Nyong nyong as well as malaria. While full house screening is required to exclude Culex species mosquitoes, screening of eaves alone or fitting ceilings has considerable potential for integrated control of other vectors of filariasis, arbovirus and malaria.