Addressing Residual Malaria Transmission in East Africa

RBM VCWG-outdoor Transmission
New Orleans, 05 November 2014
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Behavioral avoidance or physiological resistance?

“Delays in malaria eradication programs are caused more by non-response of fully susceptible vectors to attack measures than by physiological resistance, though the latter receives more attention”. ELLIOT 1972

The relative levels of attention given between the two is different
The malaria epidemiological transition in Tanzania

Loess regression line of 2193 survey data points assembled between 1980 and 2012

Residual transmission important? YES
Impact of wide spread use of LLINs

Decline in the proportion of An gambiae and raising of An arabiensis

Tanzania

Kenya

Russell & Govella et al 2011 Malar J

Bayoh & Mathias et al 2010 Malar J
An arabiensis in **western Kenya** feeds early in the evening

An arabiensis in **Pemba, Zanzibar** feeds outdoors early in the evening
Source: ZMEP

An arabiensis in **Urban Dar es Salaam, Tanzania** feeds outdoors early in the evening
Association between human outdoors activities and biting times of Vectors In Kilombero Valley Tanzania

An arabiensis avoid fatal contact with insecticides by exiting the huts immediately

Mortality of An arabiensis lower than An gambiae and An funestus

Kitau & Oxborough et al 2012. PLoS One 7(3) e31481
Additional tools are required for tackling residual malaria transmission
1. Larval Control

Application of microbial larvicide granules (bacillus thuringiensis var israensis). This programme is fully run and supported by the Government of Tanzania.
2. Environmental Management

The Importance of Drains for the Larval Development of Lymphatic Filariasis and Malaria Vectors in Dar es Salaam, United Republic of Tanzania

Marcia C. Castro¹*, Shogo Kanamori², Khadija Kannady³, Sigsbert Mkude⁴, Gerry F. Killeen⁵,⁶, Ulrike Fillinger⁷

among the strategy in the new National Malaria Control Programme 2014-2020
Strategies under efficacy Evaluation

Attracting, trapping and killing disease-transmitting mosquitoes using odor-baited stations - The Ifakara Odor-Baited Stations
Fredros O Okumu¹,², Edith P Madumla¹, Alex N John¹, Dickson W Lwetoijera¹,³, Robert D Sumaye¹

Using a new odour-baited device to explore options for luring and killing outdoor-biting malaria vectors: a report on design and field evaluation of the Mosquito Landing Box
Nancy S Matowo¹,², Jason Moore¹,², Salum Mapula¹, Edith P Madumla¹, Irene R Moshi¹, Emanuel W Kaindoa¹, Stephen P Mwangungulu¹, Deogratius R Kavishe¹, Robert D Sumaye¹, Dickson W Lwetoijera¹,³ and Fredros O Okumu¹

Protecting human when they are active outdoors
Mothers killing their own babies
Protecting human outdoors with vapour phase transfluthrin repellents

Ogoma & Ngonyani et al 2012 *Parasit & Vectors* 5:54

Lab reared *An arabiensis* > 95% Protection

Govella et al *Unpublished*

Wild mosquitoes
Establish African hub institution (secretariat) with a role to identify, or mapping members from different institution, engaging implementing partners (NMCPs) and coordinating residual transmission activities. This will facilitate communication within the region.

Establish systematic monitoring of residual transmission and how they are changing.

Develop and assess new options for tackling residual transmission.

Build entomology capacity for residents African to ensure sustainability.
Thanks very much