Selected Scientific Publications (between 1 Jan and 31 March 2023)

- *Spatial repellents: The current roadmap to global recommendation of spatial repellents for public health use*
- *Unmanned aerial vehicles for surveillance and control of vectors of malaria and other vector-borne diseases*
- *A new WHO bottle bioassay method to assess the susceptibility of mosquito vectors to public health insecticides: results from a WHO-coordinated multi-centre study*
- *Insecticides for Mosquito Control: Improving and Validating Methods to Strengthen the Evidence Base*
- *Inapparent infections shape the transmission heterogeneity of dengue*
- *Small-scale field evaluation of transfluthrin-treated eave ribbons and sandals for the control of malaria vectors in rural Tanzania*
- *Quantifying the direct and indirect protection provided by insecticide treated bed nets against malaria*
- *Assessing the variability in experimental hut trials evaluating insecticide-treated nets against malaria vectors*
- *Rapid range shifts in African Anopheles mosquitoes over the last century*
- *Seasonal dynamics of Anopheles stephensi and its implications for mosquito detection and emergent malaria control in the Horn of Africa*
- *Exploring alternative insecticide delivery options in a "lethal house lure" for malaria vector control*
- *Feeding rates of malaria vectors from a prototype attractive sugar bait station in Western Province, Zambia: results of an entomological validation study*
- *Human landing catches provide a useful measure of protective efficacy for the evaluation of volatile pyrethroid spatial repellents*
- *Laboratory evaluation of the efficacy of deltamethrin-laced attractive toxic sugar bait formulation on Anopheles stephensi*
- *Fine-scale spatial distribution of deltamethrin resistance and population structure of Anopheles funestus and Anopheles arabiensis populations in Southern Mozambique*
- *Anopheles rufipes implicated in malaria transmission both indoors and outdoors alongside Anopheles funestus and Anopheles arabiensis in rural south-east Zambia*
  Mapping current and future thermal limits to suitability for malaria transmission by the invasive mosquito Anopheles stephensi

WHO News and Publications

- *WHO Guidelines for malaria*
- *WHO prequalification of VECTRON™ T500*
- *WHO issues policy recommendation for two new types of insecticide treated nets – an important milestone for malaria prevention tools*
- *WHO certifies Azerbaijan and Tajikistan as malaria-free*
- *Vector control products targeting outdoor malaria transmission*
- *New Director of the Global Malaria Programme*
  17th meeting of the Vector Control Advisory Group (VCAG)

Webinars, websites and other resources

- *An illustrated history of the world's deadliest epidemics, from ancient Rome to Covid-19*
- *Ifakara Master Classes in Public Health & Medical Entomology*
- *PAMCA YouTube channel*
- *APMEN Webinar YouTube channel*
- *Guide to Mosquitoes in the Pacific*
- *Social and Behavior Change Guidance for Anopheles stephensi in Africa*

- *2023 PMI Malaria Operational Plans (MOPs) now online*
  MESA Forum: Responding to the threat of Anopheles stephensi invasion in Africa

In the news and social media

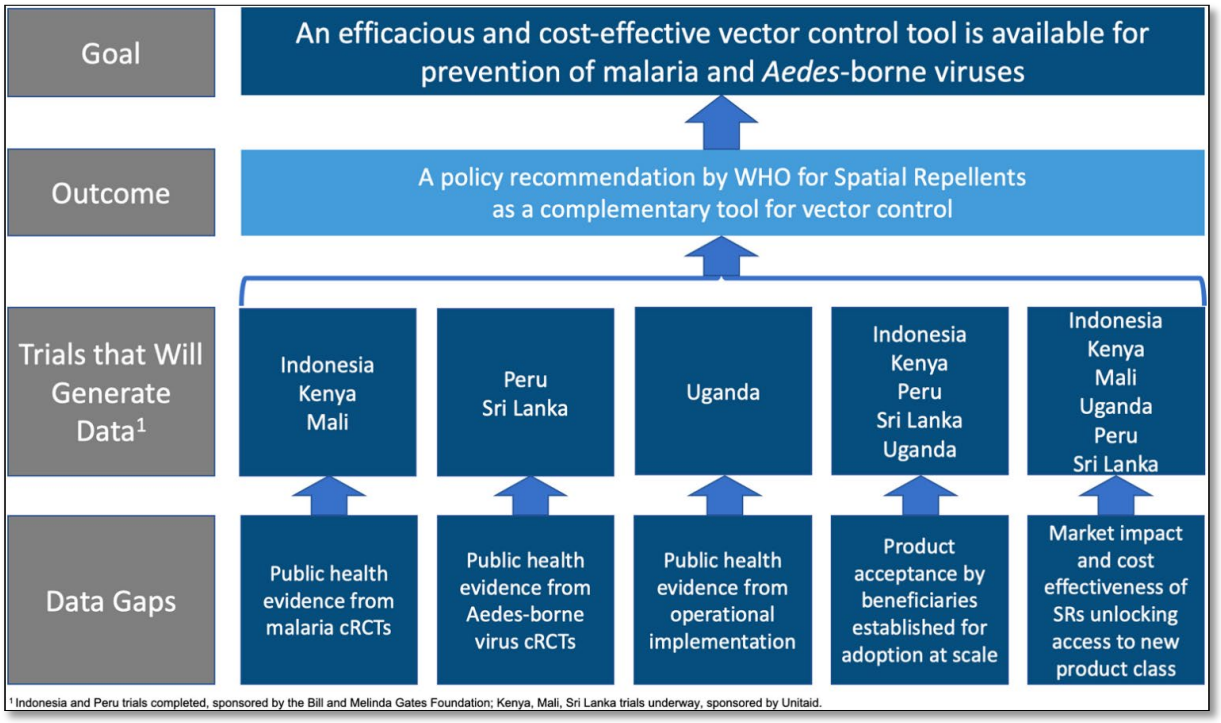
- *Abt Associates Awarded Contract to Prevent Malaria through Vector Control*
- *6 essential steps to expanding health product manufacturing in Africa*
- *Hidden 'super spreaders' spur dengue fever transmission*
- *Rwanda first African country to fully integrate drone technology in fighting malaria*
- *Paraguay shares its experience in managing the largest Chikungunya epidemic recorded in recent years in the Americas*
- *Ghana first to approve 'world-changer' malaria vaccine*
- *New entomological facility opened by Papua New Guinea Institute of Medical Research (PNGIMR)*

Selected Scientific Publications (between 1 Jan and 31 March 2023)

Spatial repellents: The current roadmap to global recommendation of spatial repellents for public health use

Curr Res Parasitol Vector Borne Dis. 2023

This paper summarizes the Unitaid funded trials under the AEGIS programme designed to fulfil evidence needs for WHO assessment and initial projections of spatial repellent cost-effectiveness against malaria and dengue.



Unmanned aerial vehicles for surveillance and control of vectors of malaria and other vector-borne diseases

Malaria Journal 20 Jan 2023

The use of Unmanned Aerial Vehicles (UAVs) has expanded rapidly in ecological conservation and agriculture, with a growing literature describing their potential applications in global health efforts including vector control.

This review aims to summarize the currently available knowledge on the capabilities of UAVs in both malaria control and in vector control more broadly in cases where the technology could be readily adapted to malaria vectors.

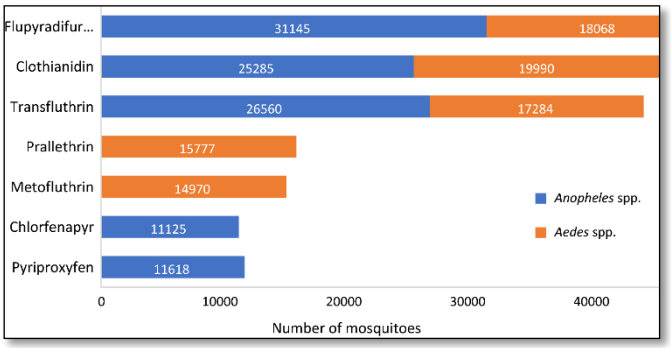
A new WHO bottle bioassay method to assess the susceptibility of mosquito vectors to public health insecticides: results from a WHO-coordinated multi-centre study

Parasites & Vectors 20 Jan 2023

This study aimed to develop and validate a new WHO glass bottle bioassay method as an alternative to the WHO standard insecticide tube test to monitor mosquito susceptibility to new public health insecticides with particular modes of action, physical properties or both. A multi-centre study involving 21 laboratories worldwide generated data on the susceptibility of seven mosquito species (*Aedes aegypti*, *Aedes albopictus*, *Anopheles gambiae* sensu stricto [*An. gambiae* s.s.], *Anopheles funestus, Anopheles stephensi, Anopheles minimus* and *Anopheles albimanus*) to seven public health insecticides in five classes, including pyrethroids (metofluthrin, prallethrin and transfluthrin), neonicotinoids (clothianidin), pyrroles (chlorfenapyr), juvenile hormone mimics (pyriproxyfen) and butenolides (flupyradifurone), in glass bottle assays.

Conclusion

Our findings, based on the largest susceptibility dataset ever produced on mosquitoes, showed that the new WHO bottle bioassay is adequate for evaluating mosquito susceptibility to new and promising public health insecticides currently deployed for vector control. The datasets presented in this study have been used recently by the WHO to establish 17 new insecticide discriminating concentrations (DCs) for either *Aedes* spp. or *Anopheles* spp. The bottle bioassay and DCs can now be widely used to monitor baseline insecticide susceptibility of wild populations of vectors of malaria and *Aedes*-borne diseases worldwide.



Total numbers of *Aedes* and *Anopheles* spp. used in WHO bottle assays according to the type of insecticide

Insecticides for Mosquito Control: Improving and Validating Methods to Strengthen the Evidence Base

Insects 23 Jan 2023

Good Decisions Require Good Data

The pipeline for new vector control tools has never been richer, with a variety of product types and vector control strategies under evaluation for both epidemiological and entomological impact. This pipeline is an achievement to be celebrated, but all of these approaches will require testing methods to measure their efficacy and predict or directly determine entomological and epidemiological impact. The same rigorous approach can be applied to other phases of product development, for example in the screening of new AIs or in formulation development. In all these areas we recommend that the same considerations be taken in developing and validating the required standardised testing methods, including clearly defining the relevant endpoints, standardising or characterising inputs and testing parameters, and being clear on how to analyse, interpret and report data in order to use the results to make robust, evidence-based decisions.

Inapparent infections shape the transmission heterogeneity of dengue

PNAS Nexus 31 Jan 2023

Pathogen super-spreaders are generally inferred by quantifying the number of secondary infections generated by an infectious individual. Here, we analyze a comprehensive data set comprising six years of contact-cluster investigations to quantify Z_{AS}, a place-based measure of transmission heterogeneity suitable for vector-borne pathogens, to describe the distribution of acute dengue virus infections in the city of Iquitos, Peru. Up to 8% of contact-clusters were identified as dengue super-spreaders due to the predominance of inapparent infections and the interaction between high *Ae. aegypti* mosquito abundance and high human susceptibility to dengue.

The marked heterogeneity in dengue, caused by the disproportionate role of inapparent infections, highlight important difficulties faced by existing interventions responding to reported symptomatic cases.

Small-scale field evaluation of transfluthrin-treated eave ribbons and sandals for the control of malaria vectors in rural Tanzania

Malaria Journal 4 Feb 2023

This study aimed to evaluate the efficacy of low-cost insecticide-treated eave ribbons (TER) and sandals (TS) as supplementary interventions against indoor-biting and outdoor-biting mosquitoes in south-eastern Tanzania, where ITNs are already widely used. TERs reduced indoor-biting, indoor-resting and outdoor-biting *Anopheles arabiensis* by 60%, 73% and 41%, respectively, while TS reduced the densities by 18%, 40% and 42%, respectively. Protection against *Anopheles funestus* ranged from 42 to 69% with TER.

Conclusion

Transfluthrin-treated eave ribbons and sandals or their combination can offer significant household-level protection against malaria vectors. Their efficacy is magnified by the transfluthrin-induced mortality, which was observed despite the prevailing pyrethroid resistance in the study area.

Must read for LLIN delivery

Quantifying the direct and indirect protection provided by insecticide treated bed nets against malaria

Nature Communications 8 Feb 2023

This work adds to the existing evidence-base for the presence of a community effect [of LLINs]. It was our aim here to try to disentangle and quantify the direct and indirect protection offered from LLINs to both users and non-users into benefits afforded by the barrier distinctly to benefits from the insecticide. This allows us to estimate what is lost through the presence of pyrethroid resistant local mosquitoes that reduces the well-established critical role of the killing effect of insecticide-treated nets.

Killeen argues that prioritising vector mortality rather than universal usage may be more cost-effective if newer products, with alternative active ingredients, are more expensive (and therefore fewer can be procured for a given region). This makes sense if the killing effect is particularly potent, and nets are distributed in a way that means non-users are in close enough proximity to benefit from the reduced numbers of mosquitoes caused by the killing action of the net. It may be cost-effective to then top-up communities with untreated nets to provide some barrier protection to those members who do not have the treated net.

Assessing the variability in experimental hut trials evaluating insecticide-treated nets against malaria vectors

Curr Res Parasitol Vector Borne Dis 9 Feb 2023

Experimental hut trials (EHTs) are increasingly playing an important role in the evaluation and regulation of indoor vector control interventions so it is important to ensure that these studies are adequately powered. The level of variability present in the assay will influence whether a given study is well powered to answer the research question being considered. We utilised disaggregated data from 15 previous EHTs to gain insight into the behaviour typically observed. Using simulations from generalised linear mixed models to obtain power estimates for EHTs, we show how factors such as the number of mosquitoes entering the huts each night and the magnitude of included random effects can influence study power.

Rapid range shifts in African Anopheles mosquitoes over the last century

Biology Letters 15 Feb 2023

Here, we use one of the most comprehensive datasets ever compiled by medical entomologists to track the observed range limits of African malaria mosquito vectors (*Anopheles* spp.) from 1898 to 2016. Using a simple regression approach, we estimate that these species' ranges gained an average of 6.5 m of elevation per year, and the southern limits of their ranges moved polewards 4.7 km per year. If confirmed, the rapid expansion of *Anopheles* ranges—on average, over 500 km southward and 700 m uphill during the period of observation—would rank among the more consequential climate change impacts on African biodiversity that have been observed to date.

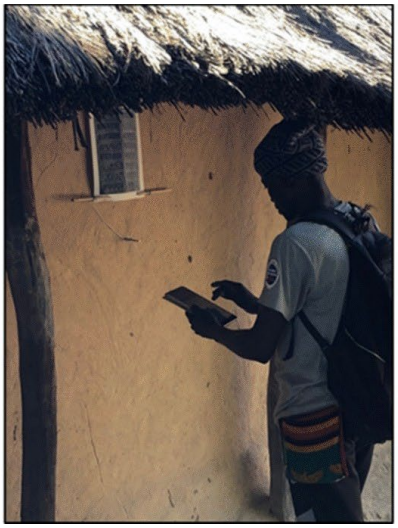
Seasonal dynamics of Anopheles stephensi and its implications for mosquito detection and emergent malaria control in the Horn of Africa

PNAS USA 21 Feb 2023

An. stephensi's temporal abundance is highly variable and, in contrast to dominant vectors across Africa, poorly predicted by patterns of rainfall, instead being shaped by temperature and patterns of land use. Our results suggest that unlike other malaria vectors in Africa, rainfall may be a poor guide to predicting the timing of peaks in *An. stephensi*-driven malaria transmission. This variation has material consequences for effective control of this invasive vector and highlights an urgent need for longitudinal entomological monitoring of the vector in its new environments.

Feeding rates of malaria vectors from a prototype attractive sugar bait station in Western Province, Zambia: results of an entomological validation study

Malaria Journal 1 March 2023


Recent proof of concept work with a prototype ATSB® Sarabi Bait Station (Westham Co., Hod-Hasharon, Israel) has demonstrated high feeding rates and significant reductions in vector density, human biting rate, and overall entomological inoculation rate for *Anopheles gambiae* sensu lato (*s.l.)* in the tropical savannah of western Mali. The study reported here was conducted in the more temperate, rainier region of Western Province, Zambia and was designed to confirm the primary vector species in region and to estimate corresponding rates of feeding from prototype attractive sugar bait (ASB) Sarabi Bait Stations.

Conclusions

Anopheles funestus and *An. gambiae* vector populations in Western Province, Zambia readily fed from the prototype Sarabi v1.1.1 ASB sugar bait station. Observed feeding rates are in line with those thought to be required for ATSB stations to achieve reductions in malaria transmission when used in combination with conventional control methods (IRS or LLIN). These results supported the decision to implement a large-scale, epidemiological cluster randomized controlled trial of ATSB in Zambia, deploying 2 ATSB stations per eligible structure.

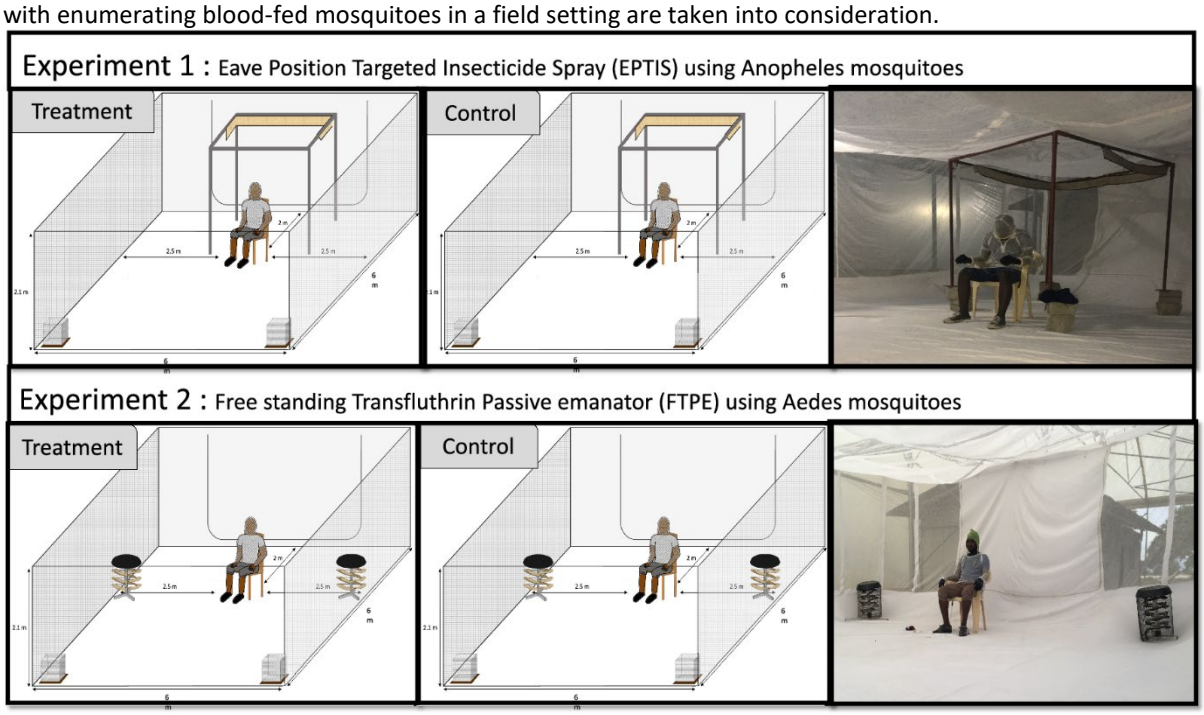
Human landing catches provide a useful measure of protective efficacy for the evaluation of volatile pyrethroid spatial repellents

Parasites & Vectors 7 March 2023

The human landing catch (HLC) method, in which human volunteers collect mosquitoes that land on them before they can bite, is used to quantify human exposure to mosquito vectors of disease. Comparing HLCs in the presence and absence of interventions such as repellents is often used to measure protective efficacy (PE). Some repellents have multiple actions, including feeding inhibition, whereby mosquitoes may be unable to bite even if they land on a host. A comparison was made between the PE of the volatile pyrethroid spatial repellent (VPSR) transfluthrin determined using a landing method (HLC) and a biting method (allowing the mosquitoes that landed to blood-feed) to evaluate whether HLC is a suitable method for the estimation of the personal PE of a VPSR.

Conclusions

The HLC method led to underestimation of mosquito feeding inhibition as a mode of action of transfluthrin, and there were species- and dose-dependent differences in the relationship between landing and biting. However, the estimated PEs were similar between the two methods. The results of this study indicate that HLC can be used as a proxy for personal PE for the evaluation of a VPSR, especially when the difficulties associated with enumerating blood-fed mosquitoes in a field setting are taken into consideration.



Laboratory evaluation of the efficacy of deltamethrin-laced attractive toxic sugar bait formulation on Anopheles stephensi

Malaria Journal 11 March 2023

This study formulated an ATSB using fruit juice, sugar and deltamethrin, a synthetic pyrethroid. It was evaluated against two laboratory strains of *Anopheles stephensi*. Initial studies evaluated comparative attractiveness of nine different fruit juices to *An*. *stephensi* adults.

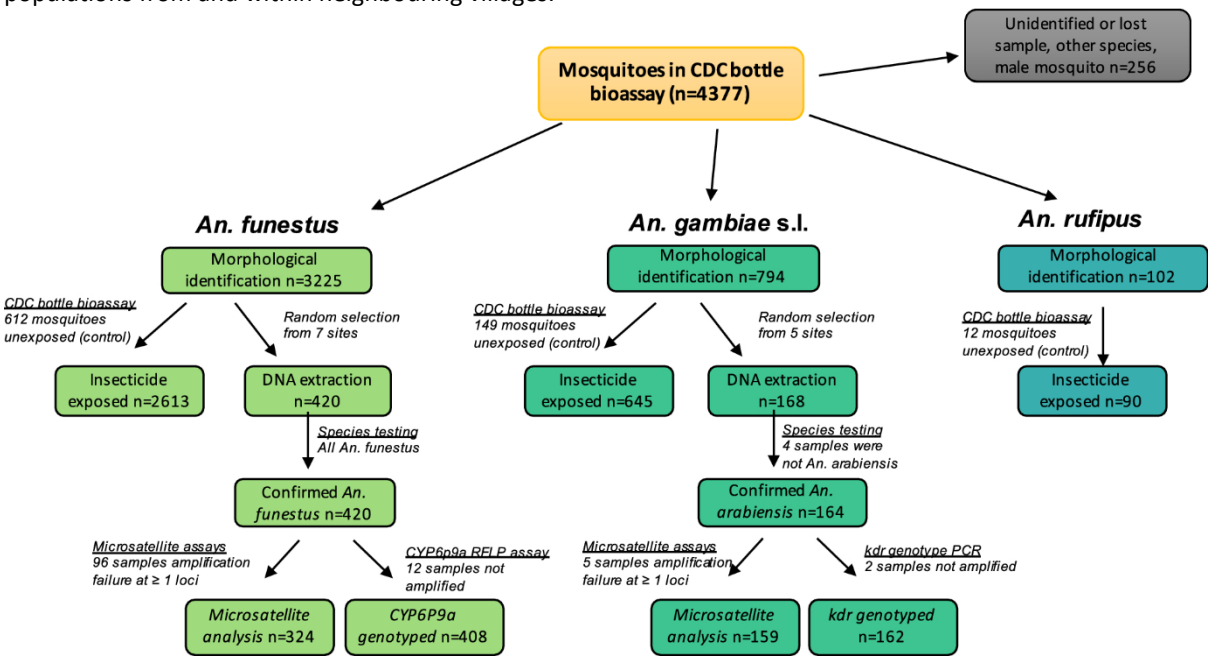
Conclusion

The ATSB formulated with guava juice-ASB and deltamethrin in 9:1 ratio showed promising results against two laboratory strains of *An*. *stephensi*. Field assessment of these formulations is being conducted to estimate their feasibility for use in mosquito control.

Fine-scale spatial distribution of deltamethrin resistance and population structure of Anopheles funestus and Anopheles arabiensis populations in Southern Mozambique

Malaria Journal 14 March 2023

Insecticide resistance in malaria vectors can be spatially highly heterogeneous, yet population structure analyses frequently find relatively high levels of gene flow among mosquito populations. Few studies have contemporaneously assessed phenotypic, genotypic and population structure analysis on mosquito populations and none at fine geographical scales. In this study, genetic diversity, population structure, and insecticide resistance profiles of *Anopheles funestus* and *Anopheles arabiensis* were examined across mosquito populations from and within neighbouring villages.

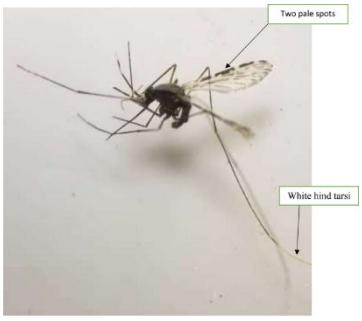


Anopheles rufipes implicated in malaria transmission both indoors and outdoors alongside Anopheles funestus and Anopheles arabiensis in rural south-east Zambia

Malaria Journal 16 March 2023

Conclusion

The findings of this study suggest that *An. rufipes* may play an important role in malaria transmission alongside *An. funestus s.s.* and *An. arabiensis* in the study location.



Mapping current and future thermal limits to suitability for malaria transmission by the invasive mosquito Anopheles stephensi

Malaria Journal 23 March 2023

In this study, the global suitability of malaria transmission by *An. stephensi* was mapped using modelled thermal limits under current and future climate scenarios. Unlike previous studies to map the distribution of malaria, the projected distributions are not limited to non-arid regions, given the life history of *An. stephensi*, and instead make similar assumptions to those for mapping *Aedes* spp. transmitted diseases.

Additionally, *An. stephensi* thermal suitability maps were combined with projected human population density estimates, enabling us to assess not only the areas that are vulnerable to malaria transmission through *An. stephensi* expansions, but also the magnitude of threat in terms of people at risk (PAR).

Conclusion

Mapping thermal suitability for malaria transmission for the invasive urban-adapted *An. stephensi* for baseline and future climate and population projection scenarios shows that much of the world is suited to continued range expansion now and into the future. While this work demonstrates that around a third of the world's population lives in areas of potential risk, understanding where range expansion is plausible, and how that

may shift in the future, provides broad scale tools for motivating surveillance and opportunities for preemptive interventions. **Of key importance, the similarity between *An. stephensi* and *Aedes* spp, and their management as urban container breeders may provide an opportunity to leverage existing vector management and control for *An. stephensi*.**

WHO News and Publications

WHO Guidelines for malaria

14 March 2023

The *WHO Guidelines for malaria* bring together the Organization's most up-to-date recommendations for malaria in one user-friendly and easy-to-navigate online platform.

The *WHO Guidelines for malaria* supersedes 2 previous WHO publications: the *Guidelines for the treatment of malaria*, *third edition* and the *Guidelines for malaria vector control.* Recommendations on malaria will continue to be reviewed and, where appropriate, updated based on the latest available evidence. Any updated recommendations will always display the date of the most recent revision in the MAGICapp platform. With each update, a new PDF version of the consolidated guidelines will also be available for download on the WHO website.

This version of the Guidelines includes recommendations on 2 new types of insecticide-treated nets.

It replaces the versions published on 16 February 2021, 13 July 2021, 18 February 2022, 31 March 2022, 3 June 2022 and 25 Nov 2022.

WHO issues policy recommendation for two new types of insecticide treated nets – an important milestone for malaria prevention tools

14 March 2023

New recommendations, published in the WHO Guidelines for malaria, cover two new classes of dual ingredient ITNs with different modes of action:

- **Pyrethroid-chlorfenapyr nets** combine a pyrethroid and a pyrrole insecticide to enhance the killing effect of the net.
- **Pyrethroid-pyriproxyfen nets** combine a pyrethroid with an insect growth regulator (IGR). The IGR disrupts mosquito growth and reproduction.

WHO prequalification of VECTRON™ T500

15 March 2023

VECTRON™ T500, a new indoor residual spray product, developed by Mitsui Chemicals Agro containing TENEBENAL™ has had its evaluation completed by the WHO Pre-Qualification vector control assessment team and has now achieved Pre-Qualifcation listing. VECTRON™ T500 represents the world's first meta-diamide active ingredient (IRAC Group 30), with a different mode of action from existing vector control products.

WHO certifies Azerbaijan and Tajikistan as malaria-free

29 March 2023

The World Health Organization (WHO) has certified Azerbaijan and Tajikistan for achieving elimination of malaria in their territories. The certification follows a sustained, century-long effort to stamp out the disease by the 2 countries.

Vector control products targeting outdoor malaria transmission

Preferred product characteristics 4 April 2023

A new preferred product characteristics document has been published by the WHO highlighting vector control products targeting outdoor malaria transmission as an unmet public health need.

New Director of the Global Malaria Programme

8 April 2023

Dr Daniel Ngamije Madandi, MD, MPH previously served as the Rwandan Minister of Health, the National Programme Officer for Malaria and Neglected Tropical Diseases (NTDs) in the WHO Rwanda country office, and the head of the National Malaria Control Programme.

17th meeting of the Vector Control Advisory Group (VCAG)

Meeting Report published 25 January 2023

The meeting took place from 3-6 Oct 2022 and focused on:

- Aedes SIT & IIT approaches
- Endectocides (BOHEMIA)
- Spatial repellents (AEGIS)
- Interceptor G2
- Royal Guard
- Gene drive (population suppression)

This report details the proceedings and outcomes of the meeting, including advice provided to applicants working on interventions in the following intervention types: sterile males, population suppression induced by gene drive, insecticide treated nets, endectocides and spatial repellents.

Webinars, websites and other resources

An illustrated history of the world's deadliest epidemics, from ancient Rome to Covid-19

Bulletin of the Atomic Scientists 16 January 2023

The history of human civilization is riddled with grizzly stories of epidemics. This website includes an interactive globe and a timeline with facts surrounding some of the known historic epidemics and pandemics that resulted in more than one million deaths. It is interesting but not surprising that malaria is not on the list. It should be.

Ifakara Master Classes in Public Health & Medical Entomology

Hosted by Fredros Okumu (Ifakara Health Institute), the recorded Q and A sessions with experts in the field on various topics are available on YouTube and well worth viewing. Recent topics include:

- 28 Jan 2023 – *Preventive therapies for malaria*

NEW

PAMCA YouTube channel

We are delighted to share that the PAMCA YouTube Channel is now up and running with lots of interesting content to watch.

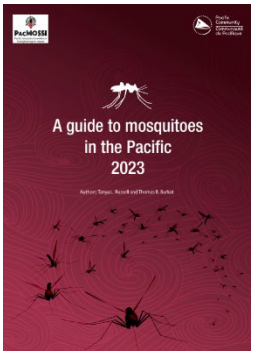
APMEN Webinar YouTube channel

APMEN hosts a webinar series to provide a platform for discussing a variety of topics of interest and sharing information related to malaria elimination. Recorded sessions are available on their YouTube channel. Recent topics include:

- 26 Jan 2023 – *Sustaining malaria responses beyond elimination: Mobilizing domestic resources & planning continuity*
- 23 Feb 2023 – *Community contribution to malaria elimination: What do we expect, and what is realistic* | TechTalks
- 4 Apr 2023 – *Malaria: What happens Post-Elimination? Prevention of Re-establishment* | APMENxChange

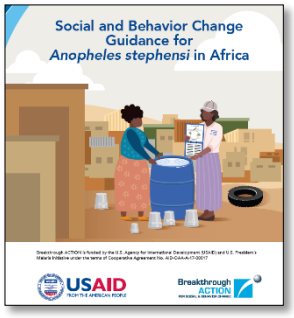
Guide to Mosquitoes in the Pacific

This new handbook provides practical and basic biological information on the behaviours and distribution of the mosquitoes of the Pacific region as they are presently known. This guide is a foundational reference for all those working towards reducing the transmission of mosquito-borne diseases in the region. An overview of the diversity and distribution of mosquitoes throughout the Pacific, including checklists for the species present in each of the 22 Pacific Island countries and territories, is provided.



Social and Behavior Change Guidance for Anopheles stephensi in Africa

February 2023



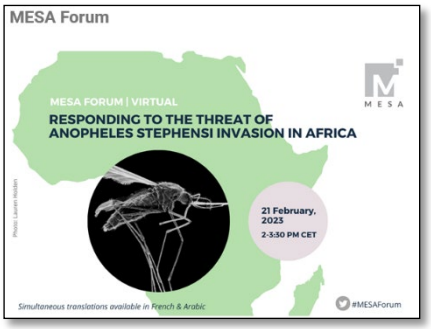
This document provides evidence-based guidance on individual, household, and community level behaviors for potential support of *Anopheles stephensi* mitigation and control interventions in Africa. *Anopheles stephensi*, a dominant malaria vector in south Asia and Arabian Peninsula, has been identified by researchers in Africa in recent years, and has the potential to threaten malaria control and elimination efforts. Social and behavior change will play a critical role in the response to this growing threat.

2023 PMI Malaria Operational Plans (MOPs) now online

The PMI Malaria Operational Plans are detailed 1-year implementation plans for PMI focus countries. Each plan reviews the current status of malaria control and prevention policies and interventions, identifies challenges and unmet needs to achieve PMI goals, and provides a description of planned PMI-funded activities. Each Malaria Operational Plan has been endorsed by the U.S. Global Malaria Coordinator and reflects collaborative discussions with the national malaria control programs and partners in country. Changes to these plans are reflected in revised postings.

MESA Forum: Responding to the threat of Anopheles stephensi invasion in Africa

22 Feb 2023



Watch the recording of a virtual forum to raise awareness and facilitate information sharing among malaria stakeholders involved in the fight against this threat. The forum highlighted the importance of *An. stephensi* invasion in the context of broader challenges facing malaria control. It provided an opportunity for actors dealing with *An. stephensi* globally to come together and engage in a discourse about measures used to come to grips with *An. stephensi* and apply the best course of action to face the challenge of this invasion in Africa.

PANELISTS:

Chair: Fitsum G Tadesse - Lead Scientist, Armauer Hansen Research Institute (AHRI) Ethiopia

- Seth Irish - World Health Organization
- Gudissa Assef - National Malaria Elimination Program Director, Ministry of Health, Ethiopia
- Sinnathamby Noble Surendran - Professor of Zoology, University of Jaffna
- Ashwani Kumar - Director ICMR-Vector Control Research Centre, India
- Sarah Zohdy - U.S. President's Malaria Initiative Entomology Team Lead

In the news and social media

Abt Associates Awarded Contract to Prevent Malaria through Vector Control

3 Jan 2023

The U.S. Agency for International Development (USAID), the lead agency for the U.S. President's Malaria Initiative (PMI), has named Abt Associates to lead the new PMI Evolve project. PMI Evolve builds on the prior projects PMI AIRS and PMI VectorLink. The new project will strengthen the capacity of local institutions, including national malaria programs, district health offices, and research institutions, to independently conduct vector control programs. PMI Evolve is also responsible for program evaluation and conducting operations research on new vector control innovations.

6 essential steps to expanding health product manufacturing in Africa

16 Jan 2023

- Africa has been largely reliant on other regions for medical supplies.
- Stronger local production would mean more equitable access to life-saving health products.
- Strengthening global health security means developing a sustainable, local manufacturing industry on the African continent.
- This article outlines six key steps to take.

Footnote: Since this article was written anouncements of planned *malaria vaccine production in Ghana* and *spatial repellent production in Kenya* have been made.

Hidden 'super spreaders' spur dengue fever transmission

Emory News Center 21 March 2023

For mosquito-borne diseases such as dengue fever, the abundance of the insects in places where people gather has long served as the main barometer for infection risk. A new study, however, suggests that the

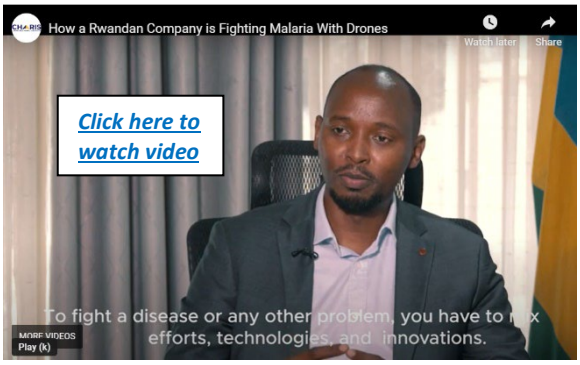
number of “hidden” infections tied to a place, or cases of infected people who show no symptoms, is the key indicator for dengue risk.

PNAS Nexus published the research led by scientists at Emory University, which drew from six years of data collected in the Amazonian city of Iquitos, Peru.

The results found that 8% of human activity spaces in the study accounted for more than half of infections during a dengue outbreak. And these “super spreader” spaces were associated with a predominance of asymptomatic cases, or 74% of all infections.

Rwanda first African country to fully integrate drone technology in fighting malaria

The New Times 28 March 2023



In a world still grappling with malaria elimination, Rwanda was the first country to integrate and deploy drones in the most malaria endemic zones of the country for an accelerated outcome.

In 2019, the government partnered with Charis Unmanned Aerial Solutions (UAS) to introduce an innovative approach to tackle the increasing malaria cases due to changes in Anopheles mosquito behaviors toward outdoor biting, and scaling-up of irrigation agriculture. Drone- based larviciding has already had a significant impact in 2020, with the Rwanda Biomedical Center reporting a reduction in malaria cases in Jabana Sector by 90.6% from 12,041 cases to 1,129 cases, in only 8 months of drone intervention.

Paraguay shares its experience in managing the largest Chikungunya epidemic recorded in recent years in the Americas

PAHO 5 Apr 2023

Ghana first to approve 'world-changer' malaria vaccine

BBC News 13 April 2023

Ghana is the first country to approve a new malaria vaccine that has been described as a "world-changer" by the scientists who developed it. The vaccine - called R21 - appears to be hugely effective, in stark contrast to previous ventures in the same field.
Ghana's drug regulators have assessed the final trial data on the vaccine's safety and effectiveness, which is not yet public, and have decided to use it.
The World Health Organization is also considering approving the vaccine.
The Serum Institute of India is preparing to produce between 100-200 million doses per year, with a vaccine factory being constructed in Accra, Ghana.

New entomological facility opened by Papua New Guinea Institute of Medical Research (PNGIMR)

IVCC 14 April 2023

On 28th March, Papua New Guinea Institute of Medical Research (PNGIMR) officially opened the Belna Natnat Haus, a new entomological facility in Madang province on the north coast of the country.