

Selected Recent Publications

[**Eave ribbons treated with the spatial repellent, transfluthrin, can effectively protect against indoor-biting and outdoor-biting malaria mosquitoes**](#)

Malaria Journal | Published on: 17 October 2018

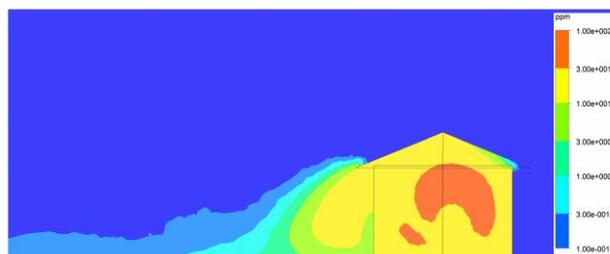
This paper builds on the topics of improved housing and passive transfluthrin emanation with some impressive results for both indoor and outdoor bite prevention. In semi-field tests, indoor-biting and outdoor-biting decreased > 99% in huts fitted with eave ribbons having $\geq 0.2\%$ transfluthrin. In field tests, the ribbons provided 96% protection indoors and 84% outdoors against *An. arabiensis*, plus 42% protection indoors and 40% outdoors against *Anopheles funestus*.



[**Controlled release spatial repellent devices \(CRDs\) as novel tools against malaria transmission: a semi-field study in Macha, Zambia**](#)

Malaria Journal Published 26 November 2018

Here is another approach to passive release of a volatile pyrethroid (in this case metofluthrin). This team includes an interesting modelling approach to evaluate distribution of metofluthrin in space.



[**Reshaping the vector control strategy for malaria elimination in Ethiopia in the context of current evidence and new tools: opportunities and challenges**](#)

Malaria Journal 5 December 2018

While this paper focuses on Ethiopia, it is a useful example of a programmatic assessment of what combination of vector control tools may be needed to reach elimination goals. The authors consider what tools are needed when LLINs and IRS are not enough to eliminate malaria and evaluate the potential of supplemental use of ivermectin administration, zooprophylaxis, odour-baited mosquito trapping, improving housing and larva control measures tailored to the local situation of malaria transmission. Unfortunately, they fall short of recommending any new tools. This appears to be driven partially by the fact that RCT results can be setting specific which leads to conclusions that new tools are not universally protective across the globe. For example, the authors cite a topical repellent RCT which demonstrated public health value in Ethiopia but still reference the Cochrane review which concludes that there is insufficient evidence concerning the effectiveness of mass distribution of repellents for malaria prevention because all results are combined.

[How house design affects malaria mosquito density, temperature, and relative humidity: an experimental study in rural Gambia](#)

Lancet Planet Health. Nov 2018

Unprecedented improvements in housing are occurring across much of rural sub-Saharan Africa, but the consequences of these changes on malaria transmission remain poorly explored. The authors examined how different typologies of rural housing affect mosquito house entry and indoor climate. Authors' Interpretation: Closing the eaves reduced vector entry in thatched houses but increased entry in metal-roofed houses. Metal-roofed houses with closed eaves were, however, protected against malaria vectors by well fitted screened doors and were made comfortable by increasing ventilation. House designs that exclude mosquitoes and are comfortable to live in should be a priority in sub-Saharan Africa.

[Screening and field performance of powder-formulated insecticides on eave tube inserts against pyrethroid resistant *Anopheles gambiae* s.l.: an investigation into 'actives' prior to a randomized controlled trial in Côte d'Ivoire](#)

Malaria Journal 22 October 2018

For those interested in following the eave tube story, this paper discusses the insecticide selection effort preceding the planned RCT.

[Field assessment of potential sugar feeding stations for disseminating bacteria in a paratransgenic approach to control malaria.](#)

Malaria Journal - Published: 17 October 2018

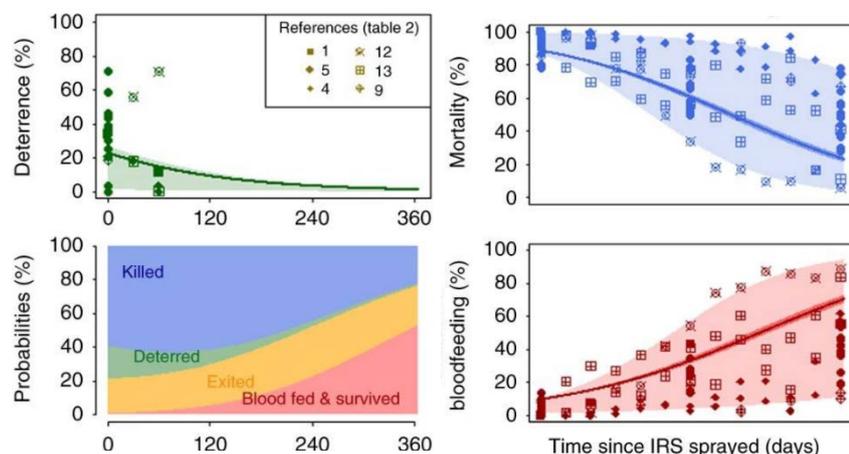
Those of you interested in mosquito sugar feeding behaviour and attractive sugar baits will find this paper worthwhile. This study aimed to assess the effectiveness of two types of sugar feeding stations to attract wild mosquitoes. Interestingly, the work was part of an exploration to deliver a genetically modified bacteria into wild mosquitoes.

[Systematic review of indoor residual spray efficacy and effectiveness against *Plasmodium falciparum* in Africa.](#)

Nat Commun. 26 November 2018

In this analysis, the authors use an extensive experimental hut trial data set to statistically assess IRS impact on

mosquito mortality, blood-feeding and deterrence (whether mosquitoes preferentially enter unsprayed over sprayed structures) and how these impacts vary over time. The impact of pyrethroid resistance on pyrethroid-IRS is quantified statistically. Using a *Plasmodium falciparum* transmission model they predict the additional number of malaria cases averted by annual application of IRS to a population with an existing level of bednet use and a defined level of pyrethroid resistance. The application of these models is demonstrated by comparing model predictions to a measured change in prevalence for a defined age-group, assessed by cross-sectional surveys in RCTs. The results indicate that non-pyrethroid IRS provides additional protection in areas where pyrethroid LLIN effectiveness is low (likely due to pyrethroid resistance). It is possible to predict RCT results of IRS trials from entomological experimental hut data using transmission models. This demonstrates the utility of the models and the potential cost-saving capacity of using models to help predict IRS



impact in locations without RCTs / pilots.

[Impact of indoor residual spraying on malaria parasitaemia in the Bunkpurugu-Yunyoo District in northern Ghana](#)

Parasites & Vectors Published on: 23 October 2018

Following a 2-year application of alpha-cypermethrin at the beginning of the high malaria transmission season...the end of high transmission season prevalence of malaria parasitaemia declined by only 9%, whilst a change of insecticide to pirimiphos-methyl yielded a decline of 57% after one year of application. The better performance of pirimiphos-methyl, compared with alpha-cypermethrin, can be explained by the high levels of pyrethroid resistance reported in the district (60–90% mosquito susceptibility to pyrethroids). The authors conclude that the use of a more efficacious insecticide for IRS can reduce malaria parasitaemia among children less than five years-old in northern Ghana.

[Novel Indoor Residual Spray Insecticide with Extended Mortality Effect: A Case of SumiShield 50WG Against Wild Resistant Populations of *Anopheles arabiensis* in Northern Tanzania](#)

Glob Health Sci Pract. 27 December 2018

In 2018, many IRS programs procured both Actellic 300CS and SumiShield 50WG deploying the two insecticides in a sub-national rotation. This study from Northern Tanzania provides one of the first published data sets of the entomological effects of SumiShield 50WG, a new, long lasting IRS product.

[Small-scale field evaluation of the efficacy and residual effect of Fludora® Fusion \(mixture of clothianidin and deltamethrin\) against susceptible and resistant *Anopheles gambiae* populations from Benin, West Africa](#)

Malaria Journal 29 December 2018

This study from Benin provides one of the first published data sets of the entomological effects of Fludora® Fusion, a new, long lasting IRS product. The present study assessed in natural conditions but on a small scale, the efficacy and the residual effect of Fludora® Fusion, a new neonicotinoid IRS formulation (mixture of clothianidin 200 mg ai/sqm + deltamethrin 25 mg ai/sqm) against populations of *Anopheles gambiae* s.s. susceptible and resistant to pyrethroids.

[ResistanceSim: development and acceptability study of a serious game to improve understanding of insecticide resistance management in vector control programmes](#)

Malaria Journal 13 November 2018

There is a widespread lack of practical knowledge of IRM and how best to utilize the new insecticides being launched. ResistanceSim is a serious game developed to improve understanding and adoption of strategies to manage insecticide resistance among vector control programmes in malaria endemic countries. The potential for this serious game to be useful in training has been demonstrated, and its utility in operational settings is currently being tested.



[Mosquito-borne arboviruses of African origin: review of key viruses and vectors](#)

Parasit Vectors. 9 Jan 2018

Africa appears to be not only the ancestral cradle of humankind, but also the spawning ground of many zoonotic diseases, especially arboviruses. It is very likely that Africa has the greatest potential for novel zoonoses and for the next export of a previously quiescent pathogen to invade elsewhere on a rapidly changing planet. The conclusion reached is that increased human population growth in decades ahead coupled with increased international travel and trade is likely to sustain and increase the threat of further geographical spread of current and new arboviral disease.

[Alternative strategies for mosquito-borne arbovirus control](#)

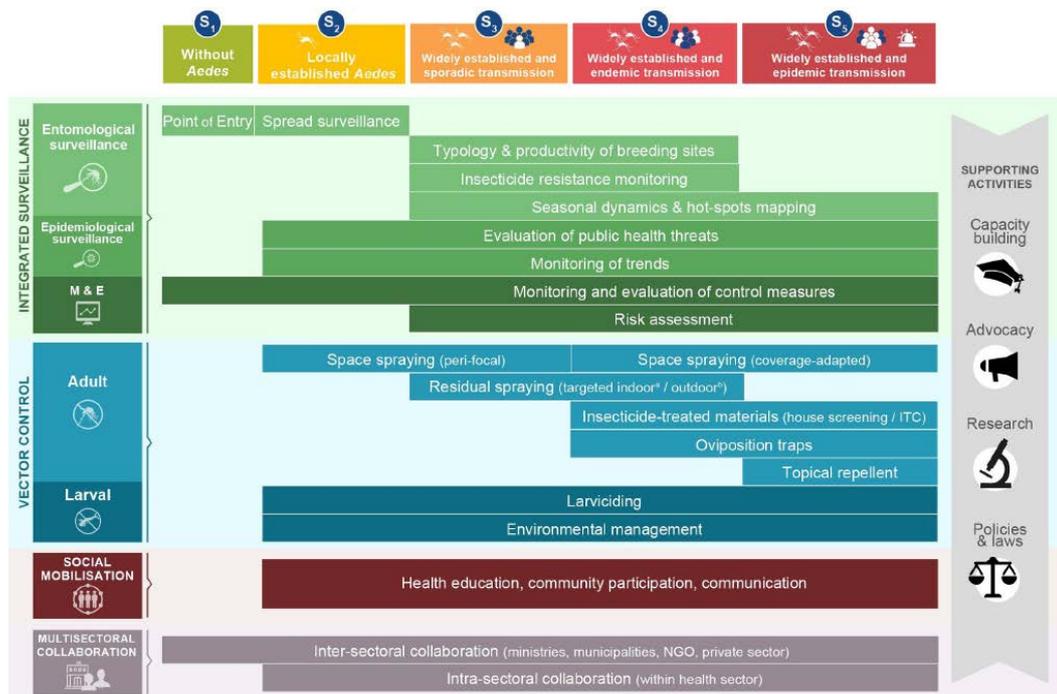
PLoS NTD 3 January 2019

This review focuses on alternative strategies mainly for control of *Ae. aegypti* and *Ae. albopictus* because these two species are arguably the primary arbovirus vectors in the world. Alternative strategies will provide additional options for arbovirus control and potentially add value to existing strategies; however, until operational effectiveness and frameworks for use are in hand, further optimization of current strategies is warranted, to include innovative delivery methods of existing products (e.g., targeted indoor residual spraying).

[Integrated Aedes management for the control of Aedes-borne diseases](#)

PLoS NTD 6 December 2018

With an increasing threat from *Aedes*-borne viruses, this is a timely review and perspective on IVM for *Aedes* vectors, referred to by the authors as integrated *Aedes* management (IAM). The authors present a framework that offers decision-making guidance based on available evidence of effective control of *Aedes* at different levels of infestation and virus transmission risk. Their work aims to strengthen the capacity of countries at risk of and/or affected by these diseases and vectors so they will be better prepared for existing and emerging *Aedes*-borne disease threats. The figure below summarizes the conceptual framework of the proposed IAM system built on 4 pillars of activities (integrated surveillance, vector control, social mobilisation, and multisectoral collaboration) and 4 supporting activities (capacity building, advocacy, policies and laws, and research). Table 2 is a nice summary of vector control tools for *Aedes* mosquito management. See this related review of [Alternative strategies for mosquito-borne arbovirus control](#) published 3 Jan 2019.



[Assessing whether universal coverage with insecticide-treated nets has been achieved: is the right indicator being used?](#)

Malaria Journal Published 11 October 2018

The objective of this study was to explore reasons why the indicator “the proportion of households owning at least 1 ITN for 2 people” falls consistently far below target levels, and to evaluate the three ITN ownership coverage indicators to see which one might better reflect whether universal coverage has been achieved. Even after successful mass campaigns, the proportion of households that own 'enough' mosquito nets (at least 1 net for every 2 people) is only around 60% but the level of individual protection - the proportion of people that could use a net within their home (ITN access) - is a lot higher. Here the authors explain the discrepancy, and what it means for mosquito net distributions. Take home message - When programmes assess the success of ITN distribution activities, population access to ITNs should be considered as the better indicator of “universal coverage,” because it is based on people as the unit of analysis.

[Host Decoy Trap \(HDT\) with cattle odour is highly effective for collection of exophagic malaria vectors](#)

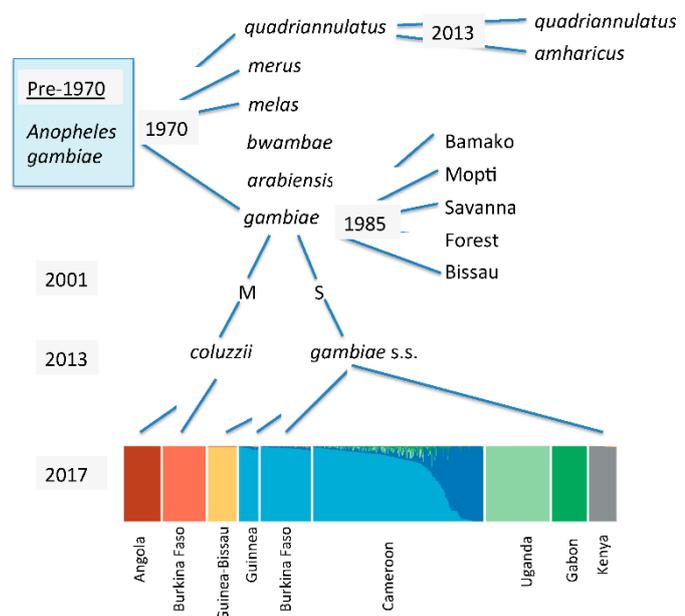
Parasites & Vectors Published: 15 October 2018

The authors report results of an evaluation of the recently developed host decoy trap (HDT) and compared it to the gold standard, human landing catch (HLC) in Kenya. They conclude: The capability of HDTs to combine host odours, heat and visual stimuli to simulate a host provides the basis of a system to sample human- and cattle-biting mosquitoes. HDT-C is particularly effective for collecting *An. arabiensis* outdoors. The HDT offers the prospect of a system to monitor and potentially control *An. arabiensis* and other outdoor-biting mosquitoes more effectively.

[Genetic Variation in Insect Vectors: Death of Typology?](#)

Insects – Published 11 October 2018

Much of the current vector biology research is founded on lab studies with relatively homogenous mosquito populations. This concept paper discusses genetic heterogeneity in vectors and how this is relevant to vector control programs, understanding variation in vector competence, genome wide association studies, identifying the origin of new introductions of invasive species, and resistance to inbreeding. The author explains how vector genetic heterogeneity can lead to failure of some approaches to vector control (e.g., there is increasing evidence that the genetic variation inherent in natural populations of vectors is likely to frustrate any such CRISPR/Cas9 type replacement programs) but can be harnessed in a vector control program based on selection for refractoriness.



[Ecology of reproduction of Anopheles arabiensis in an urban area of Bobo-Dioulasso, Burkina Faso \(West Africa\): Monthly swarming and mating frequency and their relation to environmental factors.](#)

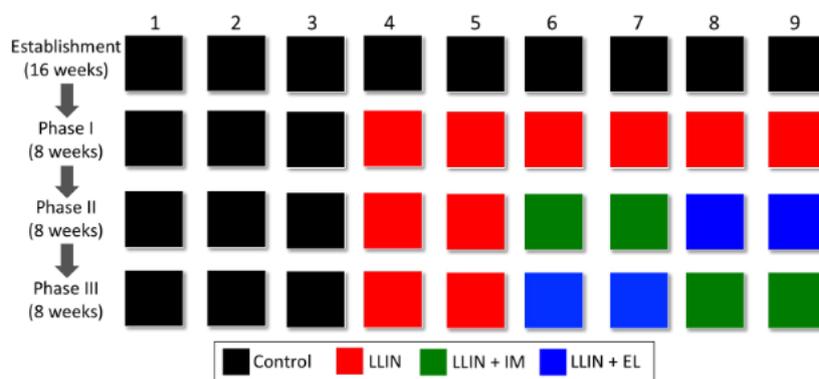
PLoS One. 7 November 2018

A better understanding of the biology and behaviour of specific mosquito populations is essential to the development of new control tools and methods. Sugar feeding, resting and mating behaviours may all be exploited to control vector populations. This paper builds on the understanding of swarming and mating behaviour and seasonality of populations of *Anopheles arabiensis* in an area of Burkina Faso.

[Mesocosm experiments reveal the impact of mosquito control measures on malaria vector life history and population dynamics](#)

Scientific Reports Published online: 17 September 2018

The authors present an approach to test products in a semi-field system to explore the impact of products alone or in combination. The impact of control measures on mosquito vector fitness and demography is usually estimated from bioassays or indirect variables in the field. Whilst indicative, neither approach is sufficient to quantify the potentially complex response of mosquito populations to combined interventions. Here, large replicated mesocosms were used to measure the population-level response of the malaria vector *Anopheles arabiensis* to long-lasting insecticidal nets (LLINs) when used in isolation, or combined with insecticidal eave louvers (EL), or treatment of cattle with the endectocide ivermectin (IM)



[Reducing contamination risk in cluster-randomized infectious disease-intervention trials](#)

Int J Epidemiol. 29 October 2018

With the significant attention on cluster-randomized trials (CRTs) to test new products and methods, this paper discusses some shortcomings of the commonly adopted “fried-egg” design used to reduce the risk of contamination between clusters and propose a novel approach for CRT design that either fully includes or fully excludes available clusters in a defined study region.

[Implications of insecticide resistance for malaria vector control with long-lasting insecticidal nets: trends in pyrethroid resistance during a WHO-coordinated multi-country prospective study](#)

Parasites & Vectors Published: 22 October 2018

This paper presents a useful and densely packed analysis of data which emerged from the WHO-coordinated epidemiological study investigating the impact of resistance on malaria infection. This paper focuses on the longitudinal monitoring of phenotypic resistance to pyrethroids undertaken in 290 clusters across Benin, Cameroon, India, Kenya and Sudan. The discussion addresses some important points including the limitations of the standard WHO test procedures.

Results: Insecticide resistance (using the WHO definition of mortality < 90%) was detected in clusters in all countries across the study period. The highest mosquito mortality (lowest resistance frequency) was consistently reported from India, in an area where ITNs had only recently been introduced. Substantial temporal and spatial variation was evident in mortality measures in all countries. Overall, a trend of decreasing mosquito mortality (increasing resistance frequency) was

recorded (odds ratio per year: 0.79 per year (95% CI: 0.79–0.81, $P < 0.001$). There was also evidence that higher net usage was associated with lower mosquito mortality in some countries. Discussion: Pyrethroid resistance increased over the study duration in four out of five countries. Insecticide-based vector control may be compromised as a result of ever higher resistance frequencies.

[**malariaAtlas: an R interface to global malariometric data hosted by the Malaria Atlas Project**](#)

Malaria Journal Published 5 October 2018

The Malaria Atlas Project (MAP) has worked to assemble and maintain a global open-access database of spatial malariometric data for over a decade. This data spans various formats and topics, including: geo-located surveys of malaria parasite rate; global administrative boundary shapefiles; and global and regional rasters representing the distribution of malaria and associated illnesses, blood disorders, and intervention coverage. MAP has recently released malariaAtlas, an R package providing a direct interface to MAP's routinely-updated malariometric databases and research outputs. malariaAtlas is the first open-access R-interface to malariometric data, providing a new and reproducible means of accessing such data within a freely available and commonly used statistical software environment. In this way, the malariaAtlas package aims to contribute to the environment of data-sharing within the malaria research community.

[**Laboratory assessment of the anti-feeding effect for up to 12 months of a slow release deltamethrin collar \(Scalibor®\) against the sand fly Phlebotomus perniciosus in dogs**](#)

Parasites & Vectors Published 27 September 2018

This work triggers thoughts of ongoing studies to explore systemic insecticides for cattle and humans and begs the question, is there a role for systemic antifeedants for mosquitoes? This study demonstrated that a slow release deltamethrin collar application to dogs reduced sand fly feeding by $\geq 94\%$, relative to unprotected control dogs, for 364 days. Thus, one collar applied to a dog can prevent or reduce the risk of sand fly transmission of *Leishmania* for one full year.

[**An odorant receptor from Anopheles sinensis in China is sensitive to oviposition attractants**](#)

Malaria Journal Published 5 October 2018

Given the appeal of attract and kill approaches for mosquito control, oviposition site seeking olfactory attractants offer opportunities for disrupting the disease-transmission process. The authors characterized a new member of the Orco ortholog subfamily which is directly involved in identification of oviposition sites. This finding will help to elucidate the molecular mechanisms underlying olfactory signaling in *An. sinensis*.

[**Insecticide-treated nets for preventing malaria \(a Cochrane Review\)**](#)

Cochrane Database Syst Rev. 6 November 2018

The primary objective of this review was to assess the impact of ITNs on mortality and malaria morbidity, incorporating any evidence published since the previous update into new and existing analyses, and assessing the certainty of the resulting evidence using GRADE.

Authors' conclusions:

Although there is some evidence that insecticide resistance frequency has some effects on mosquito mortality, it is unclear how quantitatively important this is. It appeared insufficient to downgrade the strong evidence of benefit on mortality and malaria illness from the trials conducted earlier.

[**Insecticide space spraying for preventing malaria transmission**](#)

Cochrane Database Syst Rev. 2 November 2018

The review's primary objective was to evaluate the impact of space spraying on malaria transmission, or the incremental impact when applied in combination with other malaria control methods, in comparison to equivalent conditions with no space spraying intervention. To guide future evaluations of space spraying, a secondary objective was to identify and summarize the range of space spraying strategies that have been trialled, those which were promising and warrant further evaluation, and those which appear unlikely to warrant further evaluation. Only two trials met the inclusion criteria.

Conclusion: There is evidence that suggests an effect of space spraying on the incidence of malaria, but the certainty of the evidence is very low. Reliable research in a variety of settings will help establish whether and when this intervention may be worthwhile.

[Piperonyl butoxide \(PBO\) combined with pyrethroids in insecticide-treated nets to prevent malaria in Africa.](#)

Cochrane Database Syst Rev. 29 November 2018

This review examines epidemiological and entomological evidence on whether the addition of PBO to LLINs improves their efficacy.

The authors conclude: In areas of high insecticide resistance, pyrethroid-PBO nets reduce mosquito mortality and blood feeding rates, and results from a single clinical trial demonstrate that this leads to lower malaria prevalence. Questions remain about the durability of PBO on nets, as the impact of pyrethroid-PBO LLINs on mosquito mortality was not sustained over 20 washes in experimental hut trials. There is little evidence to support higher entomological efficacy of pyrethroid-PBO nets in areas where the mosquitoes show lower levels of resistance to pyrethroids.

[Let's 'cut to the chase' on malaria elimination in the Greater Mekong Sub-region](#)

Transactions of The Royal Society of Tropical Medicine and Hygiene, 14 December 2018

(Thanks to Sean Hewitt for sharing this timely commentary and call to action).

The Greater Mekong Sub-region has made remarkable progress towards eliminating malaria in recent years, but efforts are now faltering in some areas. The development of tools to control forest-based transmission is taking too long and efforts to control malaria amongst high-risk mobile people are failing. If countries are to meet their elimination targets and prevent the spread of multi-drug resistant falciparum malaria, urgent and radical changes will be required. This commentary proposes changes in the approach to the development and roll-out of new tools as well as changes to the management of elimination efforts targeting transmission in forests and forest-farms.

WHO News and Publications

Fludora™ Fusion Prequalified by WHO

In case you have not yet seen the new [WHO World Malaria Report 2018](#), this year's Report was released in conjunction with a new approach to jumpstart progress against malaria, focusing on the 11 countries (10 on the African continent, plus India) that together account for approximately 70% of global malaria cases.

Catalysed by WHO and the RBM Partnership to End Malaria, the "High burden high impact" response will be led by countries hardest hit by the disease. Here is a short video worth watching which describes the RBM initiative titled: [High burden to high impact: A targeted malaria response](#)



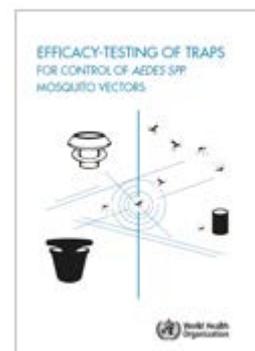
The PQT-VC team is now fully recruited and the transition of WHOPES recommended products to a PQ listing was completed in May. The PQT-VC team has convened several workshops with both industry and procurers to discuss the transition process and future plans. The PQ assessors group is also up and running and has just approved a new IRS insecticide at their last session in November.

VCAG News:

- The ninth meeting of VCAG was held 12-14 November 2018 in Geneva. The agenda and meeting documentation for this session can be accessed [here](#).
- The newly published [Efficacy-testing of traps for control of Aedes spp. Mosquito vectors](#) is now available online.

Overview

New tools to target and suppress Aedes populations are needed to protect people living in areas of risk for arboviral disease. The purpose of this document is to provide procedures and criteria for testing the efficacy of and evaluating vector traps for disease control. It includes the design of laboratory and small-scale field trials to assess the attraction and killing effects of vector traps and of large-scale community trials to determine the efficacy of traps in reducing mosquito populations in the field and disease transmission. This document is intended to support product developers, programmes and testing institutions generate robust entomological evidence of the efficacy of vector traps for control and, for a first-in-class vector trap, evidence of the public health impact in reducing arboviral disease.



The Malaria Policy Advisory Committee (MPAC) is an independent advisory group that provides strategic technical guidance to WHO as part of a transparent and credible policy-setting process on malaria. The report from the latest MPAC meeting held on 17-19 October can be found here [WHO MPAC meeting report](#),

[WHO certifies that Uzbekistan has eliminated malaria](#)

7 December 2018

After enduring a decades-long return of the malaria parasite, Uzbekistan eliminated malaria for a second time, in 2010. Now, the country has gone one step further, securing the official WHO certification of malaria-free status.



Useful websites and resources

[Alan J. Magill Malaria Eradication Symposium](#)

The recorded symposium from the ASTMH meeting can be viewed online and includes several informative speakers including a presentation from Abdisalan Noor on the WHO Malaria Burden Estimation Methods.



[Achieving innovation to impact in vector control](#)

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Institut Pasteur launches a new session of the [MOOC *Medical Entomology#2*](#), a free online course on insect and tick vectors and transmission of pathogens.

This MOOC will start on the March 18th, 2019, for 6 weeks. You can subscribe now.

The [MOOC "*Medical entomology*"](#) will teach the role of vectors in the functioning of ecosystems and how to interrupt the vector transmission chain. It is organized from an entomological perspective, with each session devoted to a particular taxonomic group of insects and ticks. The MOOC is dedicated to students in biological or medical sciences, public health advisors (human and animal health), stakeholders in vector control, researchers and NGO members.

[Online webinar from Dr Anne Wilson: Lecturer in Epidemiology – LSTM "Vector control at a crossroads: policy and implementation"](#)

Anne's presentation includes a nice summary explanation of IVM and the WHO vector control policy framework and discusses evidence generation for vector control and the role of the non-health sector in the fight against vector-borne diseases.



Vector control at a crossroads: policy and implementation

Anne Wilson, Dept Vector Biology, LSTM

16th January 2019

In case you missed the last [Vector Control Update](#) from VectorWorks...



World Health Organization Pesticide Evaluation Scheme/Prequalification Update

The process of converting the previous World Health Organization/Pesticide Evaluation Scheme (WHOPES) recommendation for vector control products into a WHO-Prequalification Team (PQT) started in 2017 and manufacturers were given a deadline

of December 31, 2017, to submit the necessary paperwork. A total of 89 applications were received; 19 were later withdrawn and 70 products were converted.

In addition, WHO-PQT held its first assessment meeting for vector control products end of May 2018 in Arusha, Tanzania, where – among others – seven new product applications and one product variation were reviewed by the experts. [Note the second PQ assessment meeting has since been held.] [The current list of all prequalified vector control products](#) is now available. It includes two WHO prequalified indoor residual spraying (IRS) product (SumiShield and Fludora Fusion), in addition to the converted products. Please check [the WHO-PQT website](#) for updates.

Vector LearningXchange Join [The Vector LearningXchange](#)

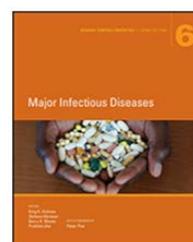
Become part of a community of malaria control stakeholders! [The Vector LearningXchanges](#) offers the most recent resources on vector control, insecticide resistance management, and IRS.

Two Malaria Chapters in the 3rd edition of *Major Infectious Diseases, 2017*

[Malaria Elimination and Eradication](#) Chapter 12

[Malaria Control](#) Chapter 13

This free online text includes two chapters focused on malaria. Chapter 12 on Malaria Elimination and Eradication and chapter 13 on Malaria Control. The details of the vector control portfolio are outdated but both are useful references.



The [Journal of the American Mosquito Control Association](#) (JAMCA) is now being published in online open access format, free to the public. While much of the content is focused on the Americas, articles such as, *Ultra-Low Volume Application of Spinosad (Natular 2EC) Larvicide as a Residual in a Tropical Environment Against Aedes and Anopheles Species* in the latest edition, are particularly relevant to those focused on new delivery methods for mosquito control.

Recent and upcoming events of note

To evaluate the Global Vector Control Response (GVCR) progress, and to discuss further strengthening of the approach, a conference will be held in Wageningen, the Netherlands, 11-13 June 2019. The conference will be organized jointly by WHO and Wageningen University & Research.

INNOVATIVE STRATEGIES FOR VECTOR CONTROL– Progress in the Global Vector Control Response – For information, you can refer to <https://www.gvcr-2019.com/>

[The BOVA \(Building out vector-borne diseases in sub-Saharan Africa\) network](#) is holding its second meeting with the aim to formulate plans for future progress and come up with practical ideas for how to make them happen. Registration is free; however (apart from 10 sponsored places for which BOVA network members can apply), all other expenses must be covered by attendees themselves.

Please register through Eventbrite:
<https://www.eventbrite.co.uk/e/second-bova-open-network-meeting-tickets-53866727833>



Registration closes on 15 March 2019

In the news

[Bayer announces WHO pre-qualification for Fludora™ Fusion to combat malaria](#)



[Denque and antimicrobial resistance make the WHO's list of 10 global health threats for 2019](#)

[Fighting malaria in the remote reaches of Cambodia](#)

Health 11 January 2019

This short video from PBS covers malaria and drug resistance issues in Cambodia.



[Climate change, pathogens, and people: The challenges of monitoring a moving target](#)

BioScience Published: 18 October 2018

This is a light read covering changing climate and various vector-borne diseases ranging from Lyme disease to malaria.

[Oxitec to Develop 2nd Friendly™ Mosquito Strain Designed to Combat Malaria-Spreading Mosquitoes](#)

18 October 2018

Oxitec released an announcement expanding their partnership with the Bill & Melinda Gates Foundation to help fight malaria-spreading mosquitoes. This follows the earlier partnership launched in June. The newest agreement is to develop another strain of Oxitec's self-limiting Friendly™ Mosquitoes, to combat *Anopheles stephensi* mosquitoes that spread malaria in South Asia, the Middle East and now in the Horn of Africa.

[Novartis and the Big Data Institute](#) to establish world-leading research alliance using artificial intelligence to understand complex diseases and improve drug development

18 January 2019

Novartis has announced a five-year collaboration with the Big Data Institute (BDI) to establish a world-leading research alliance that will improve drug development by making it more efficient and more targeted. Using artificial intelligence (AI) and advanced analytics, the partners expect to transform how ultra large and multiple

datasets are analysed, combined and interpreted to identify early predictors of patient responses to treatments for inflammatory diseases, such as multiple sclerosis (MS) and psoriasis.

[The Insect Apocalypse Is Here. What does it mean for the rest of life on Earth?](#)

The New York Times Magazine 27 November 2018

“The feeling was so common that entomologists developed a shorthand for it, named for the way many people first began to notice that they weren’t seeing as many bugs. They called it the windshield phenomenon.” This article discusses various studies on declining insect populations. Awareness of these data has triggered hearings about protecting insect biodiversity in the German Bundestag and the European Parliament. European Union member states voted to extend a ban on neonicotinoid pesticides and have begun to put money toward further studies of how abundance is changing, what is causing those changes and what can be done. It is an interesting read in the context of our reliance on vector control for global health goals and pest control for insuring food security.



Disclaimer: Given the breadth of vector control related literature, we are unable to include all relevant work. This update is intended to focus primarily on *Anopheles* biology and a subset of control topics with global relevance. Any views expressed in this update do not necessarily reflect the views or opinions of IVCC. In many cases we directly quote sections of published work. Mention of trade names or commercial products in this publication is solely for the purpose of providing specific information and does not imply recommendation or endorsement by IVCC or its funders. This document is intended solely for the use of the individual or entity to whom it is addressed. Please do not circulate more widely without the permission of the author.