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Selected Recent Publications

[Evaluation of a game-based training course to build capacity for insecticide resistance management in vector control programmes](#)

PLoS One 15 Oct 2020

Malaria control programmes are increasingly challenged with the emergence of insecticide resistance among malaria vector populations. Confronted with this challenge, vector control staff must understand insecticide resistance management, think comprehensively and react positively when confronted with new problems.

However, information on the subject is often only available through written guidelines that are difficult to put into practice. Based on the successes and strengths of educational games for health, this team developed and evaluated a novel game-based course (ResistanceSim and Resistance101) to fill the gap in training resources for insecticide resistance management. This paper describes the training resource and its evaluation in Ethiopia and Zambia.



[Insecticidal RNA interference, thinking beyond long dsRNA](#)

Pest Mgmt Sci 19 Oct 2020

The author presents a nice review of RNA interference (RNAi) technology as a candidate next generation biopesticide that promises unparalleled species specificity and biocompatibility.

[Outdoor Residual Insecticide Spraying \(ODRS\), a New Approach for the Control of the Exophilic Vectors of Human Visceral Leishmaniasis: Phlebotomus orientalis in East Africa](#)

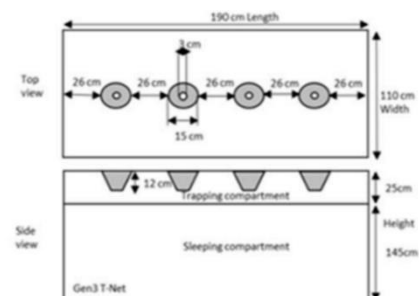
PLoS Negl Trop Dis 20 Oct 2020

Although this work is focused on sand fly control, we include it to encourage creativity and interest in exploring new approaches to target mosquitoes outdoors. The authors argue they have demonstrated the feasibility and high entomological efficacy of outdoor residual insecticide applied to household boundary fences and the exterior walls of household huts and discuss expected lower costs relative to current IVM practises. Also see below the article on a related topic, [outdoor residual spraying for malaria vectors in Myanmar](#).

[Development of an Insecticide-Free Trapping Bednet to Control Mosquitoes and Manage Resistance in Malaria Vector Control: A New Way of Thinking](#)

Insects 26 Oct 2020

In this proof of concept, the authors have demonstrated that a non-insecticidal bednet that kills mosquitoes by mechanical methods, in this case trapping, can be an efficacious “new way of thinking” vastly different from the accepted standard of using bednets treated with insecticides to prevent mosquito biting and to kill mosquitoes. In this study, the trapping (T)-Net demonstrated a 4.3 fold greater kill rate in experimental huts and a predicted 12.7 fold greater control rate at the community level for insecticide-resistant *Anopheles* mosquitoes than the insecticide treated bednet used as a control. They argue the non-insecticidal T-Net should be considered as another possible tool for malaria control as a stand-alone system and when constructed from insecticide treated textiles (an insecticide treated T-Net) could be used to improve the efficacy of insecticide treated bednets in general. They propose that, in both cases, these applications should help reduce the evolution of mosquito resistance



to both old and future new insecticide chemistries in bednets.

[A deltamethrin crystal polymorph for more effective malaria control](#)

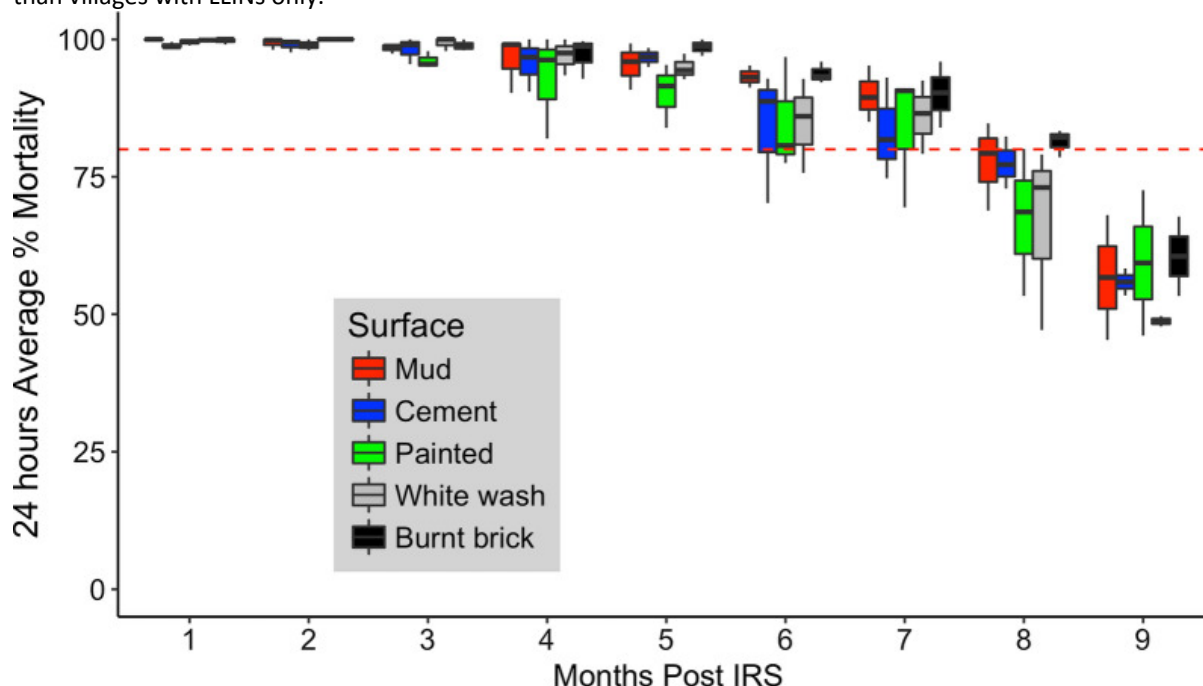
PNAS 27 Oct 2020

Significance: The use of deltamethrin faces an uncertain future, threatened by developing resistance of mosquitoes. A more active crystalline polymorph of deltamethrin, discovered here, speeds the knockdown of susceptible mosquitoes by a factor of up to 12 compared with the currently used crystalline form. The faster-acting deltamethrin polymorph is predicted to suppress malaria transmission and associated human mortality while reducing environmental exposure because less agent is required to achieve the same effect. The outstanding performance of form II promises increased serviceable use of deltamethrin crystals for indoor residual spraying.

[Malaria vector species composition and entomological indices following indoor residual spraying in regions bordering Lake Victoria, Tanzania](#)

Malaria Journal 28 Oct 2020

This paper presents results of an evaluation of the entomological impact of IRS with Actellic 300 CS against malaria vectors in Lake Victoria, northwestern Tanzania. Monthly cone bioassay indicated a mean residual duration of 7 months post-spraying (mortality > 80% WHO defined mortality threshold), with mortality remaining between 50–70% at 9 months post-spraying. The authors present evidence of a species shift in sprayed sites within the *An. funestus* group. They conclude that IRS had a substantial impact on malaria transmission, with the sporozoite rate in the predominant malaria vector species, *An. arabiensis*, being 59% lower in sprayed sites than in unsprayed sites. This is in keeping with a study in Kagera Region which showed that a combination of non-pyrethroid IRS together with pyrethroid LLINs resulted in fewer cases of malaria than villages with LLINs only.



[Impact of outdoor residual spraying on the biting rate of malaria vectors: A pilot study in four villages in Kayin state, Myanmar](#)

PLOS One 29 Oct 2020

Although the authors of this work acknowledge several limitations of this study including an inability to precisely determine the duration and magnitude of outdoor residual spraying (ORS) impact on malaria vector biting rates, they show that ORS with a capsule suspension of lambda-cyhalothrin rapidly decreased exophilic malaria vector biting rates in an area where pyrethroid resistance has been documented. They estimated that the HBR of primary malaria vector species was divided by 91% (95%CI = 88–96, $P < 0.0001$) immediately after applying a lambda-cyhalothrin mist to outdoor vegetation, thereby strongly suggesting that peridomestic

dense bushes in and around the village are an important resting site of malaria mosquitoes in this area. Interestingly, the HBR decreased both indoors and outdoors. Perhaps these results along with the novel approach by Elnaïem and colleagues (see sand fly ODRS paper above) will generate some creative thinking on ways to deliver residual adulticides to control exophilic vectors.

[Fitness effects for *Ace* insecticide resistance mutations are determined by ambient temperature](#)

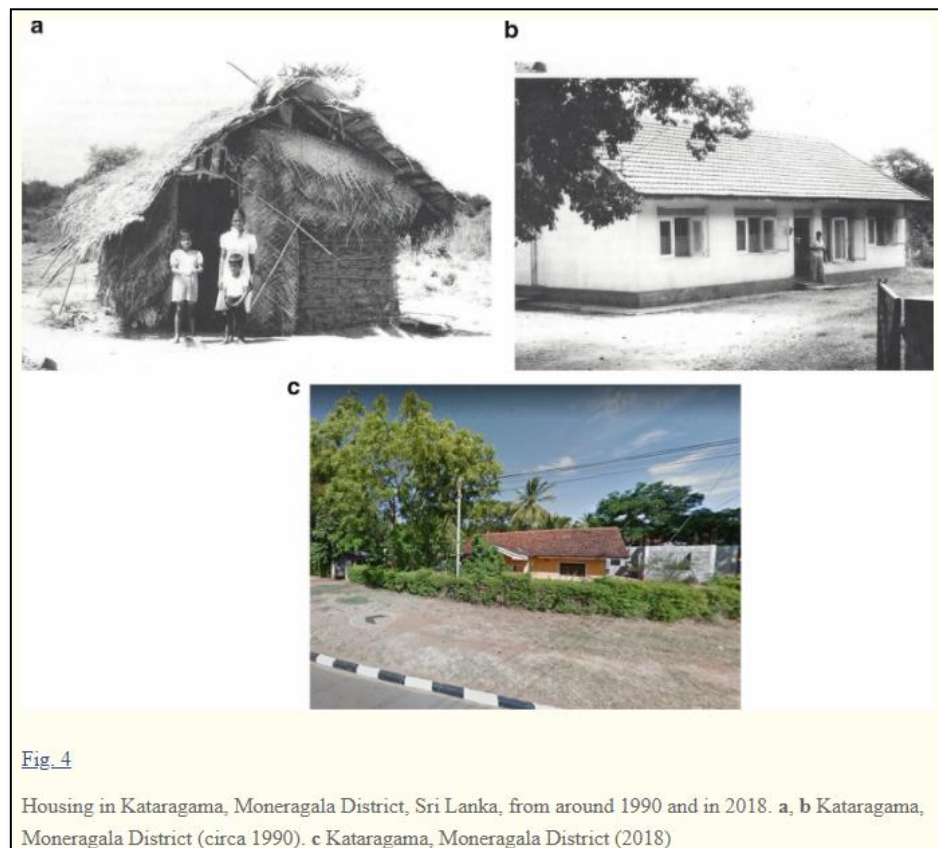
BMC Biology 30 Oct 2020

This is an interesting addition to the field of work exploring the fitness cost of maintaining mutations that confer resistance to insecticides. Although this work is in *Drosophila simulans*, there are clear implications if the patterns hold up in mosquito vector populations. The authors observed that in a cold temperature regime, *Ace* resistance mutations were strongly counter selected, but in a hot environment, the fitness costs of resistance mutations were reduced by almost 50%. They attribute this unexpected observation to the advantage of the reduced enzymatic activity of resistance mutations in hot environments.

[The role of improved housing and living environments in malaria control and elimination](#)

Malaria Journal 31 Oct 2020

The principles of malaria transmission, as formulated following the thinking of the pioneers of malaria epidemiology, Ronald Ross and George Macdonald, show how improvement in the quality of housing contributes to lower malaria risk. In the terms of a Ross/Macdonald analysis the reduced contact between humans and blood-feeding mosquitoes that is achieved through housing that is secure against mosquito entry can have a powerful effect in reducing malaria RO . The island of Sri Lanka, where malaria had been endemic, has reported no indigenous cases of malaria since 2012. Through its effects on malaria RO , improved housing is likely to have facilitated the malaria control and cessation of indigenous malaria transmission in Sri Lanka and that it will help reduce the risk of the re-introduction of malaria to the island.



[Evaluating the impact of larviciding with Bti and community education and mobilization as supplementary integrated vector management interventions for malaria control in Kenya and Ethiopia](#)

Malaria Journal 3 Nov 2020

Despite the limitations of this trial as pointed out by the authors, this paper reminds us that malaria vector control programs must be adapted to meet local conditions. This ties to a key point often overlooked by decision makers; approaches that fail in one area may work in another and vice versa. Malaria transmission is not generalizable unless the human, vector and parasite populations share similar phenotypes and ecological settings are similar. These authors assessed the effect of supplementing LLINs with either larviciding with *Bti* or community education and mobilization (CEM), or with both interventions in the context of integrated vector management (IVM). The data showed that combining LLINs with larviciding with *Bti* and CEM further reduced malaria prevalence by 50% in a low prevalence setting in Ethiopia, but not at sites with relatively higher prevalence in Kenya.

Wicked Solution for Wicked Problems: Citizen Science for Vector-Borne Disease Control in Africa

Trends Parasitol 3 Nov 2020 (Epub)

As the community searches for new approaches to strengthen national vector control programs not reliant on international donors and becomes increasingly aware of the need to adapt programs to local conditions, these authors argue that citizen science can help in vector control by boosting scientific data collection, tapping into local knowledge, and building durable partnerships between scientists and communities.

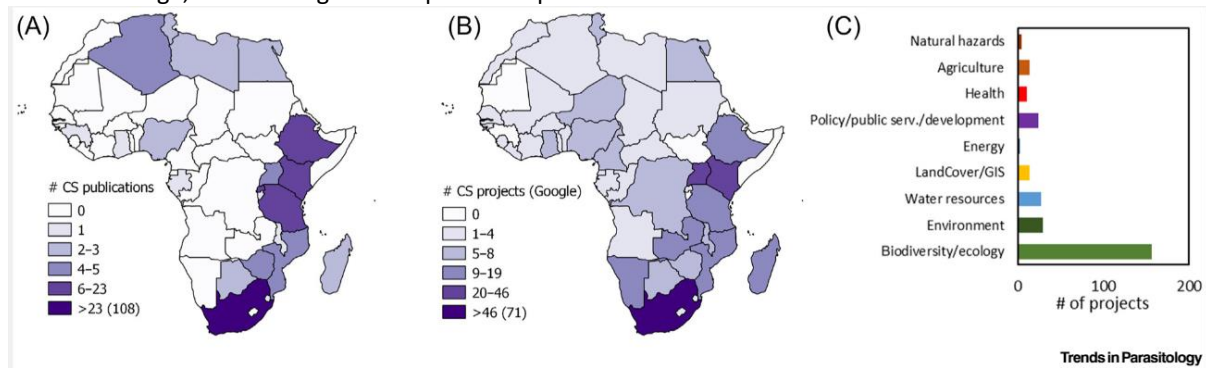
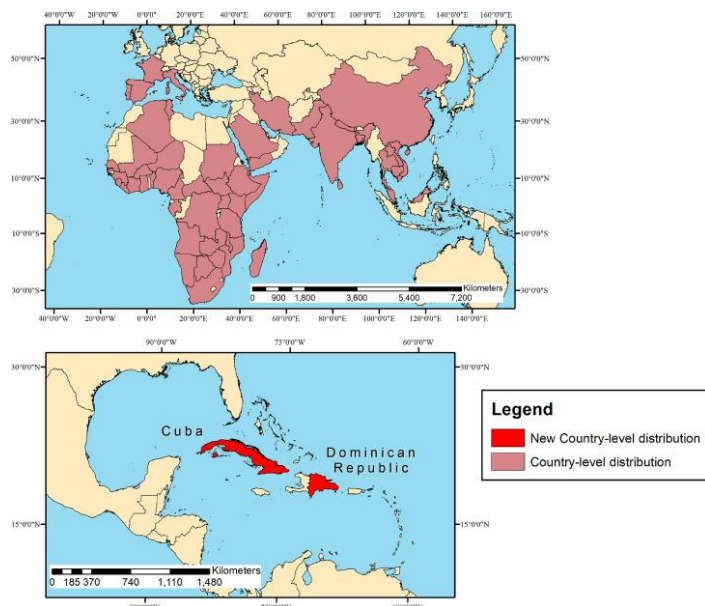


Figure 1. Geographic Distribution and Type of Citizen Science (CS) Projects in Africa. (A) The number of publications in Web of Science where title, abstract, or keywords contained the term 'citizen science' (as collected on March 16 2020) per country. A publication is ascribed to a country if one or more of the coauthors of the publication is affiliated to an institute with an address in the respective country. Affiliations and respective countries are extracted using the Bibliometrix package⁴¹. (B) The number of CS projects in Africa as the result of a nonexhaustive Google search by three individual researchers. A wide range of search terms were used, including 'citizen science', 'participatory science', 'community science', 'participatory sensing', 'voluntary geographic information', 'civic science', 'voluntary monitoring', and 'volunteered monitoring'. (C) Topic classification (based on manual classification of Google search results) of identified CS projects on the African continent; each project is only considered once if it occurred in two or more countries.

Incursion and establishment of the Old World arbovirus vector *Aedes (Fredwardsius) vittatus* (Bigot, 1861) in the Americas

Acta Tropica 4 Nov 2020 Epub

Mosquitoes on the move. If you have been following the invasion and spread of *Anopheles stephensi* in East Africa, this paper reports another mosquito invader, this one in the Americas, with potential health impacts. Routine biosurveillance efforts at the Naval Station Guantanamo Bay, Cuba, in 2019 detected two unusual mosquitoes in a CO₂-baited CDC light trap. Morphological and molecular analysis confirmed the presence of *Aedes vittatus* – the first record of the Old World dengue, chikungunya, Zika and yellow fever virus vector into the Americas – and provides evidence for its establishment in Cuba.



[Tenebenal: a meta-diamide with potential for use as a novel mode of action insecticide for public health](#)

Malaria Journal 10 Nov 2020

Broflanilide is a meta-diamide, discovered and named Tenebenal™ by Mitsui Chemicals Agro, Inc. Tenebenal™ is the first novel insecticide to be developed with the support of the IVCC programme, and represents a new mode of action and IRAC class for public health use. This paper describes work to test the efficacy and potency of Tenebenal™ against mosquito vectors of disease, both in standard laboratory assays and in tests on prototype IRS formulation and dipped nets. This study is the first to demonstrate the efficacy of Tenebenal™, indeed any meta-diamide pesticide, against mosquito vectors of disease. The paper contains a large data set worth reading. Here we call attention to one promising example result regarding longevity if IRS applications. When mortality was scored at 72 h, mortality dropped below 80% on cement in months 18 and 19 but activity was retained for the whole experiment on wood and ceramic tiles. On mud, efficacy was maintained for 12 months at the lowest two concentrations, 17 months at 0.1% and the full 20 months at 0.2%.

[Exploiting the chemical ecology of mosquito oviposition behavior in mosquito surveillance and control: a review](#)

Journal of Vector Ecology 18 Nov 2020

In this thorough review the authors summarize the roles that infochemicals play in the behavioral pattern and responses of the oviposition phase of mosquitoes. In the last decade much progress has been made in the discovery of infochemicals mediating oviposition behavior of anophelines. They conclude that there is a great potential of utilizing infochemicals mediating oviposition behavior in mosquitoes for the development of vector surveillance and control strategies.

[Nextgen Vector Surveillance Tools: sensitive, specific, cost-effective and epidemiologically relevant](#)

Malaria Journal 25 Nov 2020

This paper presents the results of an expert review in which 40 vector control experts were interviewed to assess the benefits and limitations of current vector surveillance tools and techniques. By defining the strengths and weaknesses of the current vector surveillance methods, a foundation and initial framework was provided to define the target product profiles (TPPs) for the next generation of vector surveillance methods. The next generation of surveillance tools needs to address the limitations of present tools by being more sensitive, specific and less costly to deploy to enable the collection and use of epidemiologically relevant vector data to facilitate more proactive vector control guidance. The discussion includes sections on:

- Sampling adult mosquitoes
- Mosquito identification
- Age grading
- Parasite detection in mosquitoes
- Insecticide resistance and quality assurance
- Bioassay for insecticide concentrations on treated surfaces

Surveillance Tool ^a	Informants using the tool (%) ^b	Indicators measured by surveillance tool category ^c					Insecticide Resistance frequency
		Occurrence/Density	Resting indoors ^d	Resting outdoors	HBI		
Oral aspirator	28%	●	●	●	●	●	
Battery aspirator	28%	●	●	●	●	●	
Pyrethrum spray catch	23%	●	●	●	●	●	
Artificial resting shelters	23%	●	●	●	●	●	
Barrier screens	15%	●	●	●	●	●	
Pit traps	10%	●	●	●	●	●	
Window exit trap	8%	●	●	●	●	●	

[A New Test of a Theory about Old Mosquitoes](#)

Trends in Parasitology 26 Nov 2020

Fans of Macdonald's vectorial capacity equation (and who isn't?), and its importance in guiding vector control strategies, will find this paper interesting. In vector control, it is widely accepted that killing adult mosquitoes would sharply reduce the proportion of old mosquitoes and cause the greatest changes to malaria

transmission. The principle is based on a mathematical model of the sporozoite rate (the proportion of infective mosquitoes) that emphasized changes in mosquito age. Killing adult mosquitoes also reduces mosquito population densities which are directly proportional to human biting rates (the number of bites, per person, per day). In this opinion paper, the authors argue that entomological surveillance should prioritize measuring the human biting rates (HBR).

[Efficacy of extended release formulations of Natular™ \(spinosad\) against larvae and adults of Anopheles mosquitoes in western Kenya](#)

Malaria Journal 26 Nov 2020

Among the concerns related to larviciding is the feasibility of implementation in tropical areas with large numbers of habitats and the need for frequent application. Formulated products of spinosad that are designed to be effective for several weeks may mitigate some of these concerns. The extended release granular formulation and the dispersible tablet formulations of spinosad tested here were effective against larval Anopheles mosquitoes for up to four weeks.

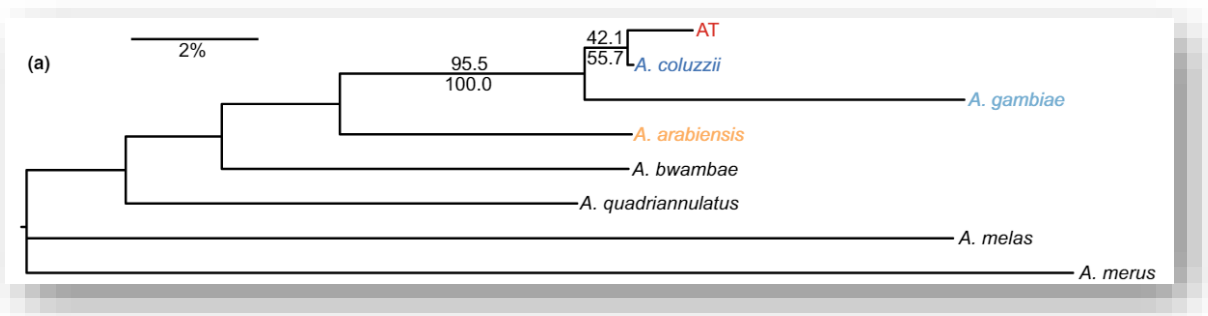
For an opinion piece on this topic published the same day as this paper, [see Zhou et al, 2020](#), who discusses the same topic of long-lasting larvicides as a promising approach to overcome cost-effectiveness and feasibility challenges of larval source management. Zhou and colleagues discuss another larvicide product with a targeted longevity of months.

[A population genomic unveiling of a new cryptic mosquito taxon within the malaria-transmitting Anopheles gambiae complex](#)

Molecular Ecology 30 Nov 2020

Just when we were getting accustomed to using *Anopheles coluzzii*...

These authors examined whole-genome sequencing data from a longitudinal study of putative *An. coluzzii* and discovered many specimens were genetically divergent from *An. coluzzii* and all other *Anopheles* species and represent a new taxon, here designated *Anopheles TENGRELA*. This is not only fascinating science but also has important potential malaria control implications. Misidentified cryptic taxa could seriously confound ongoing studies of *Anopheles* ecology and evolution in western Africa, including phenotypic and genotypic surveys of insecticide resistance. Reproductive barriers between cryptic species may also complicate novel vector control efforts, for example gene drives, and hinder predictions about evolutionary dynamics of *Anopheles* and *Plasmodium*.



The Journal of Infectious Disease has published a Supplemental Issue titled [Multisectoral Approach for the Prevention and Control of Vector-Borne Diseases](#)

1 Dec 2020

This issue contains six articles:

- *Introduction to a Landscape Analysis of Multisectoral Approaches for Prevention and Control of Infectious and Vector-Borne Diseases* (Florence Fouque, Karin Gross, Zee Leung, and Konstantina Boutsika)

- *The Role of the Private Sector in Supporting Malaria Control in Resource Development Settings* (Robert T. Jones, Lucy S. Tusting, Hugh M. P. Smith, Sylvester Segbaya, Michael B. Macdonald, Michael J. Bangs, and James G. Logan)
- *Multisectoral Approach to Address Chikungunya Outbreaks Driven by Human Mobility: A Systematic Review and Meta-Analysis* (Rashad Abdul-Ghani, Florence Fouque, Mohammed A. K. Mahdy, Qingxia Zhong, Samira M. A. Al-Eryani, Abdulsamad Alkwri, and John C. Beier)
- *Multisectoral Approach to Support Use of Insecticide-Treated Net for Malaria Prevention Among Mobile and Migrant Populations in Myanmar: A Systematic Review* (Cho Naing, Maxine A Whittaker, and Marcel Tanner)
- *Recommendations for Intersectoral Collaboration for the Prevention and Control of Vector-Borne Diseases: Results from a Modified Delphi Process* (Carl Abelardo T. Antonio, Amiel Nazer C. Bermudez, Kim L. Cochon, Ma. Sophia Graciela L. Reyes, Chelseah Denise H. Torres, Sophia Anne S. P. Liao, Dorothy Jean N. Ortega, Abegail Visia Marie C. Silang, Deinzal R. Uezono, Evalyn A. Roxas, and Maria Sonia S. Salamat)
- *Break Down the Silos: A Conceptual Framework on Multisectoral Approaches to the Prevention and Control of Vector-Borne Diseases* (Qingxia Zhong and Florence Fouque)

[An evaluation of *Bacillus thuringiensis israelensis* \(AM65-52\) treatment for the control of *Aedes aegypti* using vehicle-mounted WALIS® application in a densely populated urban area of Puerto Rico](#)

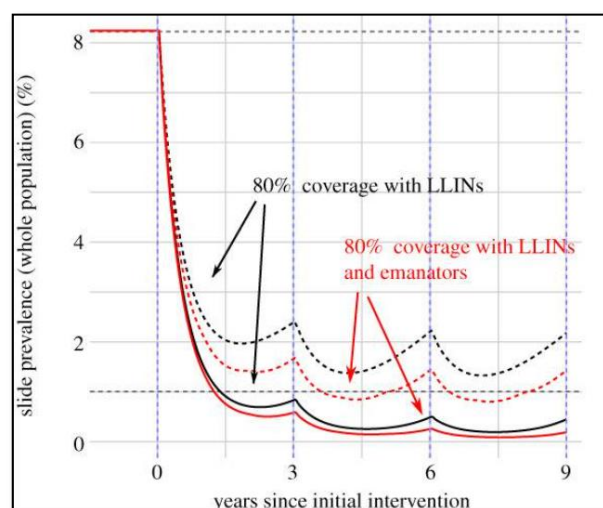
Pest Management Science 13 Dec 2020

With growing interest in improving the feasibility and cost-effectiveness of larval source management, this paper reports the results of a trial targeting *Aedes aegypti* in urban areas of Puerto Rico. Wide-area larvicide spraying has been tested, with positive results, in several other locations. The method tested here is a larvicide application strategy that uses wind-distributed aqueous microdroplets of mosquito larvicide to target cryptic larval sources across complex landscapes. The authors conclude that repeated wide-area larvicide spray application of *Bti* AM65-52 WDG to residential areas in Puerto Rico effectively suppressed dengue vector populations. The success of this trial has led to expansion of the program to other municipalities in Puerto Rico.

[Assessing the impact of low-technology emanators alongside long-lasting insecticidal nets to control malaria](#)

Philos Trans R Soc Lond B Biol Sci 28 Dec 2020 (Epub)

How effective will new vector control tools be? Here modellers from Imperial College London work with Dr. Ogoma (then with the Ifakara Health Institute) and use her field data to incorporate a low-technology transfluthrin emanator into a mathematical model of malaria transmission to predict its public health impact across a range of scenarios. Their conclusion: the public health benefit of adding emanators or spatial repellents to communities protected by insecticide-treated bednets depends heavily on the bionomics of the local mosquito population. The mathematical modelling exercise indicated that emanators provided an additional benefit over LLIN use alone in all explored scenarios. Generally, this benefit was largest in areas that where the mosquito population had a low HBI, high outdoor biting and were susceptible to the insecticides used on LLINs, suggesting that spatial repellents could be targeted to locations with specific entomological characteristics. The work also reiterates that emanators that induce mosquito mortality should be prioritized. LLINs in an area with susceptible mosquitoes are predicted to be highly effective at reducing malaria prevalence. Providing an emanator to people who use bednets will further

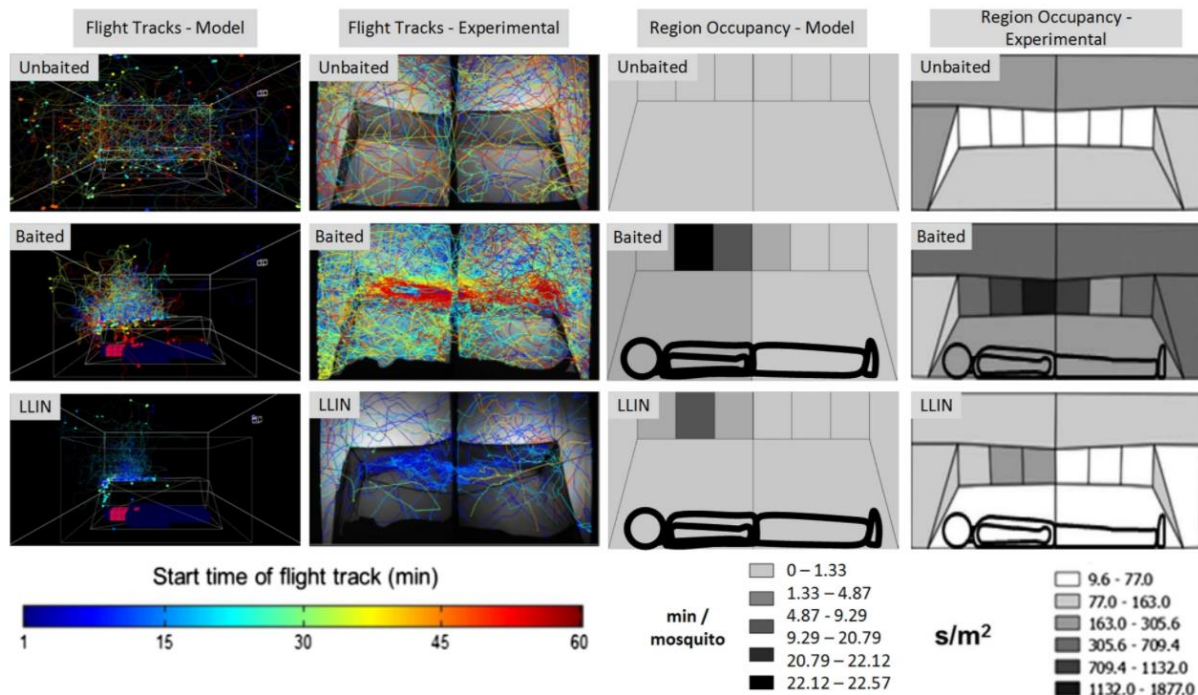


reduce disease prevalence but the added benefit is relatively low in comparison with the impact of nets. Nevertheless, distributing this type of emanator on top of LLINs is still predicted to prevent between 0.44 and 122 cases per 1000 0–5-year-olds in the first year of distribution against mosquitoes with high HBI. More cases are prevented in areas with high outdoor biting and greater transmission intensity. Emanators also prevented more cases when deployed against mosquitoes with a low HBI, preventing between 1.45 and 255 cases per 1000 0–5-year-olds.

[A minimal 3D model of mosquito flight behaviour around the human baited bed net](#)

Malaria Journal 7 Jan 2021

Advances in digitized video-tracking and behavioural analysis have enabled accurate recording and quantification of mosquito flight and host-seeking behaviours, facilitating development of individual (agent) based models at much finer spatial scales than previously possible. Results generated by the model are an accurate representation of actual mosquito behaviour recorded at and around a human-occupied bed net in untreated and insecticide-treated nets. This fine-grained model is highly flexible and has significant potential for in silico screening of novel bed net designs, potentially reducing time and cost and accelerating the deployment of new and more effective tools for protecting against malaria in sub-Saharan Africa.

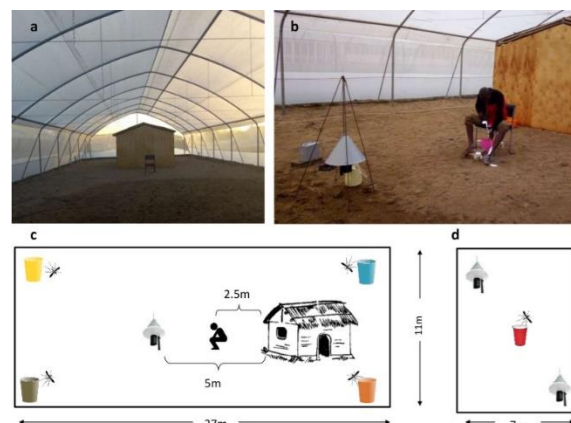


Spatio-temporal flight tracks and peri-bed net regional occupancy. Simulation (Cols 1 & 3) and experimental (Col 2 & 4) data. Track colour indicates time (scale for flight tracks indicated below Cols 1 & 2). Region colour indicates mean occupancy time indicated below Cols 3 & 4. Conditions shown are for an unbaited net (top row), an untreated net (middle row) and LLIN treated net (bottom row). Model tracks show a single mosquito for clarity and circular regions denote landing sites. Experimental images reproduced courtesy of [11]

[Evaluating putative repellent 'push' and attractive 'pull' components for manipulating the odour orientation of host-seeking malaria vectors in the peri-domestic space](#)

Parasites and Vectors 11 Jan 2021

In this study, outdoor human landing catches and trap comparisons were implemented in large semi-field systems to optimize products to use in a “push-pull” field trial. The authors tested: (i) the efficacy of Citriodiol® and transfluthrin-treated fabric strips positioned in house eave gaps as push components for preventing bites; (ii) measured the efficacy of MB5-



baited Suna-traps in attracting vectors in the presence of a human being; (iii) assessed 2-butanone as a CO₂ replacement for trapping; (iv) determined the protection provided by a full push-pull set up. Transfluthrin-treated hessian fabric strips loosely fixed around eave gaps prevented, depending on the experimental conditions, between 40 and 80% of the *An. arabiensis* bites a human volunteer would have received in the absence of the treatment. In the configuration tested, the 'pull' did not provide a valuable addition to a spatial repellent as humans remain more attractive to host-seeking malaria vectors than the attractant systems tested.

The results of the subsequent field trial are expected to be published later this year.

[A Low-Powered and Highly Selective Trap for Male Aedes \(Diptera: Culicidae\) Surveillance: The Male Aedes Sound Trap](#)

J Med Entomol 12 Jan 2021

With a growing interest in both male mosquito behaviour and in attract and kill approaches, this work offers an interesting solution with regard to *Ae. aegypti*. Could it be adapted to other species? This team has developed a Male Aedes Sound Trap (MAST) that requires minimal power and is highly species-specific. Two different versions of the MAST were developed, one that uses synthetic pyrethroid to kill captured mosquitoes (MAST Spray) and another which has an internal divider to create a killing chamber in which a sticky panel can be placed to capture mosquitoes (MAST Sticky). The prototype version of the sound lure is designed and built by Verily Life Science and consisted of an 8-ohm 0.5-watt speaker mounted to a printed circuit board (PCB).

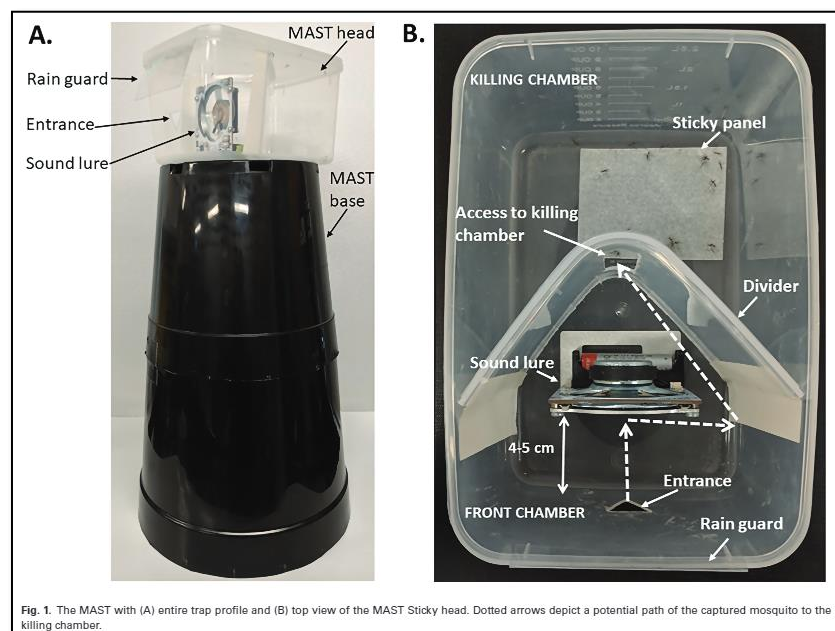


Fig. 1. The MAST with (A) entire trap profile and (B) top view of the MAST Sticky head. Dotted arrows depict a potential path of the captured mosquito to the killing chamber.

WHO News and Publications

[Malaria Policy Advisory Group \(MPAG\) meeting report](#)

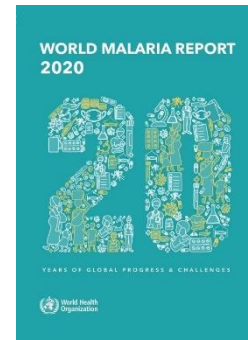
22 Dec 2020

On 3–4 December 2020, the WHO Malaria Policy Advisory Group (MPAG) convened virtually to review updates and progress, and to provide guidance on thematic areas of work by the Global Malaria Programme. The virtual meeting focused on 5 topics: 1) an update on the malaria surveillance assessment toolkit; 2) an update on the “High burden to high impact (HBHI)” approach, including a partner perspective from the RBM Partnership to End Malaria, use of strategic information to drive impact, and country support; 3) an update on the Global technical strategy for malaria 2016–2030 (GTS); 4) an update on the consolidated WHO Guidelines for malaria; and 5) an update on the Malaria Vaccine Implementation Programme (MVIP).

[World malaria report 2020](#) 20 years of global progress & challenges

30 November 2020

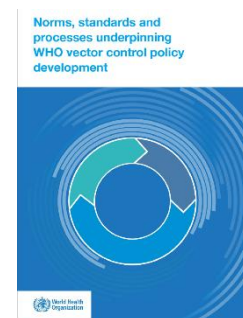
The report features a detailed analysis on progress towards the 2020 milestones of WHO’s global malaria strategy and a special section on malaria and the COVID-19 pandemic. It highlights that progress against malaria continues to plateau, particularly in high burden countries in Africa. Over the last 2 years, high burden to high impact countries have been moving away from a “one-size-fits-all” approach to malaria control opting, instead, for tailored responses based on local data and intelligence.



[Norms, standards and processes underpinning WHO vector control policy recommendations](#)

22 December 2020

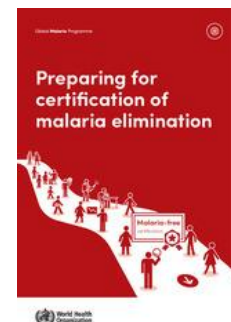
WHO have published updated guidance on how to evaluate new vector control interventions and develop policy. This document outlines the evaluation process that WHO undertakes to assess novel tools and strategies targeted at vector-borne diseases. Its aim is to articulate the link between the generation of evidence that demonstrates public health impact of novel interventions and the development of policy recommendations based on the generated data. The document defines standards for the evaluation process as well as the steps that an applicant needs to undertake along with some guiding principles that aim to support applicants in the development of submissions with WHO.



[Preparing for certification of malaria elimination](#)

4 January 2021

This document provides extended guidance to countries that are nearing malaria elimination on preparing for certification. It provides an overview of the certification process and details of activities required in national preparation for certification. It includes tools that countries can use to organize the documentation required for certification, to prepare a national elimination report and to assess their readiness for certification. Guidance on verification of subnational malaria elimination, a process overseen by national authorities, is also provided.



Webinars, websites and other resources

[PAMCA-VectorBase Students and Young Investigators Virtual Vector Meeting 2020.](#)

1-2 December 2020

PAMCA and VectorBase recently collaborated to host a free, virtual vector conference/workshop experience, primarily aimed at PAMCA student & young investigators. Several of the recorded lectures are available including presentations on VectorBase, IR Mapper, FAIR Data for Africa, how to do a gene drive risk assessment, mosquito surveillance data, data considerations and an introduction to the Global Vector Hub.



[Vector Control: Role and status of bednets, IRS and insecticide resistance in APAC | APMEN TechTalks](#)

This is the latest in the APMEN TechTalks series. Past webinars are also available at [Malaria Elimination in Asia Pacific](#) on YouTube.



[LSTM \(virtual\) Seminar: Reducing Malaria Prevalence in Africa Through New Classes of Insecticide-Treated Nets](#)

18 Nov 2020

In this seminar LSTM Professor Hilary Ranson, Professor Martin Donnelly, Professor Philip



McCall, Dr Mark Paine, Dr David Weetman, and Dr Gareth Lycett highlighted how research from the Department of Vector Biology at LSTM on the mechanisms underpinning pyrethroid resistance and the behavioural response of mosquitoes to ITNS has led to the development of new classes of ITNs mosquitoes. They discussed how, by working in partnership with different sectors, they have developed the evidence base for the public health value of these nets that has led to their widespread deployment across Africa to combat resistant mosquito populations.

[Latest from the Malaria Must Die Campaign, the Champions Fighting Malaria](#)

This campaign is led by champions playing a critical part to help end malaria. They include scientists, doctors, researchers and activists - all helping to beat this disease within a generation.

David Beckham is delivering a message of hope from a time in the future when we have ended one of the world's oldest and deadliest diseases – malaria.

Against the backdrop of the Covid-19 pandemic, David Beckham is reigniting the belief that humankind is capable of uniting to defeat diseases - creating a safer, healthier, stronger world for us all and for future generations.

The fight is harder than ever but we have the chance to change the course of history and end a disease that kills a child every two minutes.



[Global Atlas of Medical Entomology Schooling \(GAMES\)](#)

TDR and the Global Vector Hub (GVH) have developed a web-based global directory of medical entomology courses as a new resource for strengthening the capacity of scientists combating neglected tropical diseases and other vector-borne diseases. TDR has supported the development of a Global Atlas of Medical Entomology Schooling (GAMES), which lists a total of 126 medical entomology courses offered both on-campus and through distance learning in 32 countries across all WHO regions, covering seven languages. The freely available directory was developed in collaboration with the GVH and ARCTEC at the London School of Hygiene & Tropical Medicine (LSHTM), following the mapping of courses available globally. WHO's Department of Control of Neglected Tropical Diseases and the WHO Global Malaria Programme have also reviewed the directory and provided recommendations. For each course, session dates, course outline, fees, language of instruction and responsible managers are listed.

Courses ✕

Directory of courses on medical entomology available on-campus and online.
 Click "More Information" to navigate to see a course outline and further details.
 Click [here](#) to contact us.

Search:

Country	Name	Institution	Language	Keywords	Course Outline
Argentina	Entomología Experimental: Medición y Análisis de Variables Fisiológicas y Comportamentales	Universidad de Buenos Aires, Departamento de Ecología, Genética y Evolución	Spanish	Entomology; Short course; 1 week; Insect rearing;	More Information
Argentina	Reconocimiento de la Identidad en Insectos: Bases Químicas y Neuroetológicas	Universidad de Buenos Aires, Departamento de Ecología, Genética y Evolución	Spanish	Short course; 1 week; Insect behaviour; parasitology	More Information

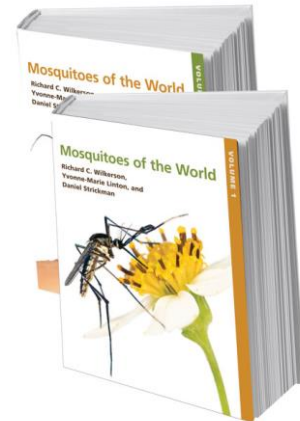
New APMEN and APLMA Websites

APMEN-APLMA begin a new year of sustaining and accelerating progress against malaria with a refreshed strategy and website. Check out our new websites [APMEN](#) and [APLMA](#) with new tools and resources!

[Mosquitoes of the World](#)

Richard C. Wilkerson, Yvonne-Marie Linton, and Daniel Strickman
 Published 19 January 2021

After decades of work, this definitive reference on the biology, evolution, ecology, and diversity of all known species of the world's mosquitoes is in print. Readers will discover that some mosquitoes undertake courtship rituals, while others guard their eggs, feed solely on earthworms, or can survive as immatures under ice sheets or in salt-encrusted pools. Hundreds of drawings and high-resolution, close-up images illustrate the text. This is likely the most complete reference work on mosquitoes ever produced. Volume 1 is a great reference for entomologists, public health professionals, and epidemiologists across the world. Volume 2 consists of an incredible taxonomic catalogue detailing the current taxonomic and systematic status of all 3,698 valid mosquito species. Well done Rick, Yvonne and Dan!



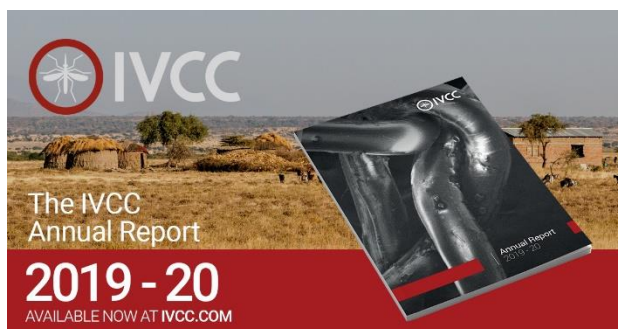
[Identification keys to the Anopheles mosquitoes of South America](#)

This new 4-part collection investigates the identification keys to the *Anopheles* mosquitoes of South America (Diptera: Culicidae) and explores the challenges encountered by the research aimed at mosquito identification, malaria control and elimination.

[Identification keys to the Anopheles mosquitoes of South America \(Diptera: Culicidae\). I. Introduction](#)
[Identification keys to the Anopheles mosquitoes of South America \(Diptera: Culicidae\). II. Fourth-instar larvae](#)

[Identification key to the Anopheles mosquitoes of South America \(Diptera: Culicidae\). III. Male genitalia](#)

[Identification keys to the Anopheles mosquitoes of South America \(Diptera: Culicidae\). IV. Adult females](#)



The [IVCC Annual Report 2019-2020](#) has been published. The report showcases IVCC's work to facilitate innovative approaches to preventing vector-borne diseases and tackle the growing threat of insecticide resistance. With activities across the globe and spanning research and development and market access, we are accelerating the process from innovation to impact. The report is a reminder of the importance of collaborative working and

the progress laid out in it is testament, too, to the commitment of our partners from industry, academia, the public sector and advocacy. We are grateful for the support of all of our funders who make life-saving vector control possible.

IVCC has also recently published a document title [Vector Control: 10 Challenges and 10 Solutions](#) describing some of the major challenges to malaria vector control and discussing what the partnership is doing to solve those challenges.



The MESA team continues to expand their online resources. Now in addition to [MESA Track](#), a living database which captures research projects and institutions' portfolios in malaria elimination and eradication, the team collates a growing archive of learning papers, conference abstract books and presentations, and a [calendar for funding opportunities and Requests for Proposals](#).



Upcoming events

An online list of vector-related conferences is maintained on the [infraVec2 website](#).



This year the RBM VCWG annual meeting will be replaced by five virtual sessions during the months of March and April.

The dates of the virtual sessions are on:

18 March and 15, 20, 22, 29 April. All sessions will start at 15.00 Geneva time (CET) and will run for 3 hours each. The registration will open on Thursday 18 February.

[7th Pan - African Mosquito Control Association \(PAMCA\) Annual Conference](#) has been postponed until later in 2021.

[The 87th American Mosquito Control Association Annual Meeting](#) will be online March 2-5, 2021. The [agenda is now available](#).

The AMCA Annual Meeting is an excellent education and networking event for researchers, educators, vector control professionals, industry representatives, and students in mosquito control. Every year since 1935, hundreds gather to hear the latest research, share ideas, and form collaborations. An educational sessions and exhibit hall helps to put attendees on the cutting-edge of this ever-expanding field.

In the news and social media

[Restructuring of the RBM Vector Control Working Group](#)

The decision to restructure the VCWG work streams was borne from both the need to revitalize certain activities and from valuable feedback from VCWG members after the last two annual meetings. We have, therefore, taken the opportunity to capitalize on streamlining of related activities, focusing energies on priorities and trying to support the delivery of tangible outcomes supporting the needs of the malaria vector control community, complete with a specific Focus Group on Vector Control for Humanitarian Emergencies. The Working Group will now be based around three primary work streams:

1. Enhancing Impact of Core Interventions
2. Expanding the Vector Control Toolbox
3. Implementing the Global Vector Control Response

[See more detail on the new VCWG work stream structure and leadership here.](#)

[New Hosting Arrangements for APMEN Working Groups to drive malaria elimination in Asia-Pacific](#)

ANNOUNCEMENT 18 January 2021

Vector Control Working Group (VCWG): The [Malaria Consortium](#) has been an APMEN partner for several years, including serving as the host of its Vector Control Working Group (VCWG). Malaria Consortium was established in 2003 and has since been a leading health-support NGO in both Africa and Asia. MC's mission is to improve lives in Africa and Asia through sustainable, evidence-based programmes that combat targeted diseases and promote child and maternal health. MC has had a strong presence in Asia for almost a decade with offices in Cambodia, Thailand and Myanmar and a strong network of collaborating partners throughout Asia. Malaria Consortium has demonstrated its commitment to bring benefits not just through its various projects fighting malaria, dengue, and various diseases that have particular impact on mothers and children, but also capacity building through programmes such as its Dr Sylvia Meek Scholarship grants for MSc students each year.

[Call for Nominations: Chairs for APMEN Surveillance & Response, Vector Control and Vivax Working Groups](#)

Government officials from Ministries of Health and National Malaria Programs interested in chairing any of the APMEN Working Groups are requested to send a Nomination to the APMEN Secretariat (pshein@aplma.org) by February 15, 2021.

[The new mosquito bringing disease to North America](#), the discovery of a novel mosquito on Guantanamo Bay reveals how globalisation is threatening to unleash the next pandemic.

BBC 18 Jan 2021

This BBC Future article tells the story of the discovery of *Aedes vittatus* in the New World as published recently in *Acta Tropica*

[Incursion and establishment of the Old World arbovirus vector *Aedes \(Fredwardsius\) vittatus* \(Bigot, 1861\) in the Americas](#)

Note this issue covers the period from mid October 2020 through mid January 2021.

Disclaimer: Given the breadth of vector control related literature, we are unable to include all relevant work. This update is intended to focus primarily *Anopheles* vectors 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 abstracts and other 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. Readers may view copyrighted publications shared here provided that the information is only for their personal, non-commercial use.