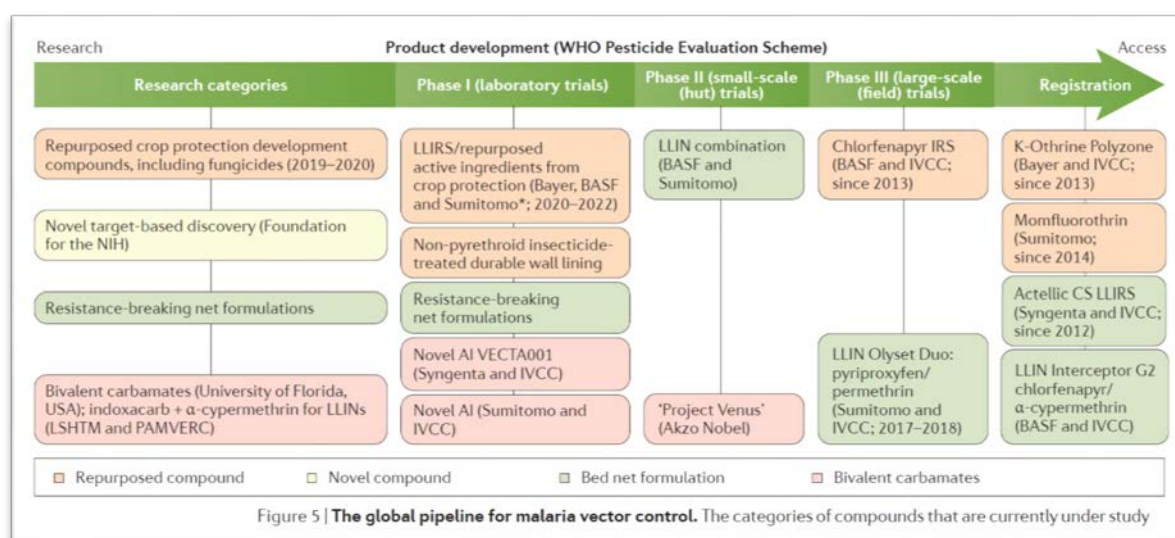


Selected Recent Publications

Malaria. Phillips MA, Burrows JN, Manyando C, van Huijsduijnen RH, Van Voorhis WC, Wells TNC. In Nature Rev Dis Primers. 3 Aug 2017.

This is a well done, broad review of malaria well worth a read to expand ones overall understanding of malaria and developments for control. Several nice figures make it even more informative and easy to read. It discusses progress in diagnostics and new treatments (drugs and vaccines), chemoprotection and chemoprevention including vector control. It is interesting to see what they have included (and missed) for the vector control pipeline.



[Chlorfenapyr \(A Pyrrole Insecticide\) Applied Alone or as a Mixture with Alpha-Cypermethrin for Indoor Residual Spraying against Pyrethroid Resistant *Anopheles gambiae* sl: An Experimental Hut Study in Cove, Benin.](#)

PLoS One. 2 Sep 2016

This study was designed to assess the efficacy of chlorfenapyr applied alone or as a mixture with alpha-cypermethrin for IRS against pyrethroid resistant *Anopheles gambiae* sl in Cove, Southern Benin. A direct comparison was made with alpha-cypermethrin alone. Cone bioassays were performed to assess the residual efficacy of the IRS applications over time. The authors (Ngufor, Critchley, Fagbohoun, N'Guessan, Todjinou, and Rowland) conclude that IRS with chlorfenapyr shows potential to significantly improve the control of malaria transmission in pyrethroid resistant areas compared to pyrethroid IRS or the mixture. They also state that the standard, 30 minute in situ cone bioassay is not predictive of the performance of chlorfenapyr IRS under field conditions. Problematic when this is what WHO uses to qualify a product.

[Does resistance really carry a fitness cost?](#)

In Current Opinion in Insect Science, published in June 2017 (shared by Dave Malone this month)

This opinion piece addresses an ongoing debate but I felt as if the question was unanswered at the end. After a complex discussion, much of which was largely over my head technically, the authors vacillate, admitting some evidence of fitness costs but conclude by saying, "what is clear is that if the

costs of resistance are small or non-existent then resistance management strategies that rely on alternations will not work in the longer term. Therefore, in the absence of a cost, resistance can only be overcome by the introduction of a new class of chemistry to which no pre-existing mechanisms confer cross-resistance.” The authors call out these highlights:

- New resistance mutations are predicted to be costly but this is rarely shown in the field.
- Fitness costs are predicted to be offset by ‘modifier’ loci but specific examples are rare.
- Resistance mutations can be pre-existing polymorphisms or maintained by sexual antagonism.
- Duplication of resistance loci can maintain a susceptible copy in permanent heterozygosis.
- CRISPR-CAS can be used to make mutations in a defined genetic background for future fitness studies.

[A reduction in malaria transmission intensity in Northern Ghana after 7 years of indoor residual spraying](#)

Malar Journal Published: 10 Aug 2017

This paper is limited to entomological endpoints but is compelling none the less. They show a general and significant decline in the parity rates in the IRS district over the 7 years. Transmission indicators increased following the withdrawal of IRS from Tolon Kumbungu District.

[Malaria incidence among children less than 5 years during and after cessation of indoor residual spraying in Northern Uganda](#)

Malaria Journal Published: 7 August 2017

This is an interesting paper highlighting the importance of timing of IRS implementation in Northern Uganda, 2010-2014, in 10 endemic districts and the consequences when IRS is discontinued. Prior to withdrawal of IRS, there was a sustained decline in incidence of malaria among under-5-year-olds for all the months between spray operations; however, the timing of spray activities was sub-optimal.

[The development of an ivermectin-based attractive toxic sugar bait \(ATSB\) to target *Anopheles arabiensis*](#)

Malaria Journal Published: 15 August 2017

This study describes yet another group (IHI and STPH) working on an ATSB solution. In this case the authors claim to have developed a sugar-baited resting place (which they call the ATSB-RP) containing a toxic dose of ivermectin for the control of *Anopheles arabiensis*.

[The Economic Value of Long-Lasting Insecticidal Nets and Indoor Residual Spraying Implementation in Mozambique](#)

Am J Trop Med Hyg. June 2017

This article describes the findings of the Mozambique Modeling Working Group which was convened by the GF with the goal of investigating the cost effectiveness of differing allocation options of LLINs versus IRS, taking into account the heterogeneous transmission throughout the country, to inform the country’s Global Fund application. I honestly have not had time to assess the model assumptions or to digest their conclusions which are:

- Any increase in LLINs (from 80% baseline coverage) or IRS (from 80% baseline coverage) would be cost-effective
 - That LLIN coverage increases tend to be more cost-effective than similar IRS coverage increases, except where both pyrethroid resistance is high and LLIN usage is low.
 - IRS may have an important role in insecticide resistance management and epidemic control.
 - Malaria intervention campaigns are not a one-size-fits-all solution, and tailored approaches are necessary to account for the heterogeneity of malaria epidemiology.
-

[Volatile Pyrethroids as a Potential Mosquito Abatement Tool: A Review of Pyrethroid-Containing Spatial Repellents](#)

Journal of Integrated Pest Management, Published: 02 August 2017

This is an interesting review of the work to date on volatile pyrethroids which provides some insight on the spectrum of effects of these AIs. The authors discuss how volatile pyrethroids, or spatial repellents, have multiple effects on mosquito vectors, but are currently used one-dimensionally for spatial repellency. They also detail the potential for incorporating volatile pyrethroids into vector abatement efforts and describe the evidence gap with regard to the epidemiological impacts of using spatial repellents and their potential to reduce genetic resistance to insecticides.

[Outbreak of human malaria caused by *Plasmodium simium* in the Atlantic Forest in Rio de Janeiro](#)

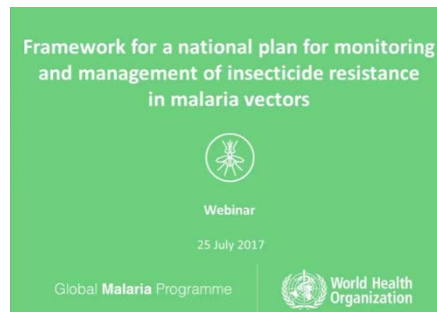
In The Lancet Global Health Published: 31 August 2017

Malaria was eliminated from southern and southeastern Brazil over 50 years ago. However, an increasing number of autochthonous episodes attributed to *Plasmodium vivax* have recently been reported from the Atlantic Forest region of Rio de Janeiro state. As the *P. vivax*-like non-human primate malaria parasite species *Plasmodium simium* is locally enzootic, the authors performed a molecular epidemiological investigation to determine whether zoonotic malaria transmission is occurring. "This unequivocal demonstration of zoonotic transmission, 50 years after the only previous report of *Plasmodium simium* in people, leads to the possibility that this parasite has always infected people in this region, but that it has been consistently misdiagnosed as *P. vivax* because of an absence of molecular typing techniques."

WHO Publications

If you missed the WHO's Global Malaria Programme (GMP) webinar held last month on the monitoring and management of insecticide resistance in malaria vectors, a recording of the webinar is available in YouTube here:

<https://www.youtube.com/watch?v=lvHeR9Ok-1Q>



Useful websites and resources

The first phase of the [Vector Learning Xchange](#) is live. It is a Roll Back Malaria collaborative site where indoor residual spraying (IRS) and insecticide resistance stakeholders from around the world can learn from one another on the most effective ways to prevent malaria. The site aims to provide best practices, tools, trainings and lessons learned on IRS operations, entomological monitoring and surveillance, environmental compliance, monitoring and evaluation, community mobilization and social behavior change, capacity building, and gender inclusion. They also plan to include the latest data on insecticide resistance (IR) and resistance management as the site is developed. It is a collaborative site so it will take time to build up the resources and we should contribute. Please visit the site and let Marlice Coleman know if you have anything you'd like to add that is IRS related.

VectorWorks is pleased to share the most recent update of the [ITN Access and Use Report](#). The report includes recently released data from Angola's 2015-16 DHS and Ghana's 2016 MIS, along with all published DHS and MIS data from 93 other surveys in 44 countries. An annex has been added

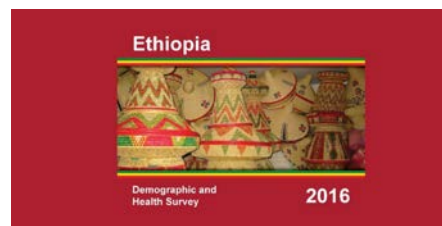
with a Stata do-file. The report is updated periodically when new datasets are released. You can always find the most up to date version at <http://www.vector-works.org/resources/itn-access-and-use/>

You may be interested in the online resources available through [MIMCom](#), a project of the Multilateral Initiative on Malaria and the National Library of Medicine, conceived by African malaria researchers in 1997 and designed and implemented by NLM in collaboration with partners in Africa, US, UK, and Europe. The mandate for Internet access to medical literature came from African scientists: "Access to e-mail and the Internet will promote rapid communication between investigators working at different sites as well as access to online literature and data available to scientists outside Africa." Having established or enhanced connectivity at 21 research sites in 12 countries, NLM's current focus is on products and databases to aid the efforts of malaria research.

(credit: Marelize Coleman)



The [Ethiopia DHS, 2016 - Final Report](#) is now available.



Recent and upcoming events of note

World Mosquito Day fell on Sunday, August 20th, marking the day in 1897 that a British Medical Officer in India, Ronald Ross, changed the course of history with the discovery of the malaria parasite in the “dapple-winged” mosquito. I am sure you all celebrated appropriately. Various organizations shared information on the day.

- Helen Jamet of Vestergaard coordinated production of a [World Mosquito Day Video](#) acknowledging the day (and of course advertising their products)



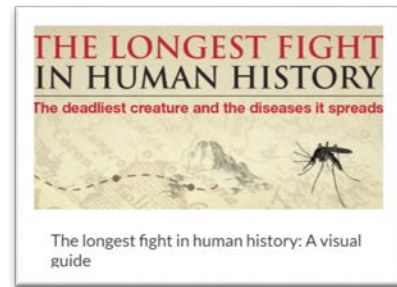
- Sumitomo Chemical Company released a good-looking product describing our fight against mosquitoes.

[The longest fight in human history: A visual guide.](#)



- Bill Gates posted an article and a video called **[Mosquito Wars](#)** on

his personal online blog GatesNotes where he emphasizes the need for new approaches to eradicate malaria including mapping, eave tubes, genome editing and ATSBs.



In the news

[Malaria outbreak kills over 4,000 in S. Sudan: official](#)

August 21, 2017 (JUBA) - An outbreak of malaria in South Sudan has killed over 4,000 people since February, a senior health official disclosed last week.

“This year’s malaria is the most severe the country has ever seen,” Dr. Isaac Mapeer, the deputy head of Malaria Control Program at South Sudan’s Ministry of Health, told Anadolu Agency on Thursday. A total of over 900,000 malaria cases had so far been registered, according to Mapeer.

“4,073 deaths were recorded since February, while 2,000 deaths were reported in 2016”, he stressed.

In Pakistan **[Global Fund pledges \\$13.8m support to control malaria in 66 endemic districts](#)**

National News August 30, 2017

ISLAMABAD: After much postponement, the Global Fund (TGF) has finally pledge \$13.8 million for malaria control interventions in 66 high malaria endemic districts of Pakistan. Some of the key activities that will include a National Malaria Prevalence Survey; distribution of Long Lasting Insecticide Treated Nets (LLINs) to sustain universal coverage; malaria programmatic review; updating national and provincial strategic plans; impact assessment exercise; and a mass media campaign, among others.

[East Africa Region Streamlining Drug Regulatory Procedures To Speed Access To New Products](#) 30 August in Bloomberg

"One of the world's poorest regions is making itself more friendly to new products from Novartis AG, Roche Holding AG, and other drugmakers by combining the pharmacy regulators of six countries. The East African Community Medicines Registration Harmonization program allows Bayer AG, Merck KGaA, and rivals to speed products to market, while easing patients' access to new medicines. Drugmakers would like to see the scope of the project, which started in 2012, widened to more countries..."

[World's biggest drone drug deliveries take off in Tanzania](#)

Reuters 29 August 2017

Tanzania is set to launch the world’s largest drone delivery network in January, with drones parachuting blood and medicines out of the skies to save the lives of women giving birth and children struck by malaria, in a country larger than Nigeria. California’s Zipline will make 2,000 deliveries a day to more than 1,000 health facilities across the east African country, including blood,

vaccines and malaria and AIDS drugs, following the success of a smaller project in nearby Rwanda.

[Update on the CDC for Africa](#)

The Africa CDC was officially launched in January of this year. It is a growing partnership that aims to build countries' capacity to help create a world that is safe and secure from infectious disease threats. This article doesn't have much detail of value but I wanted to keep this topic fresh as we watch the organization develop.

[Assisting partners to increase IRS coverage](#)

16 AUGUST 2017

This story is featured on both the IVCC and AIRS websites and highlights the return of IRS to a high burden district of Ghana thanks to the NgenIRS partnership and Unitaid funding... "The main reason for the return was a drop in the price of the insecticide used for indoor residual spraying (IRS)."



Quote

O million-murdering Death.
I know this little thing
A myriad men will save
- *Sir Ronald Ross*
