

Rotarians Against Malaria (RAM) Scientific Committee Coordinator Report August 2019

Updates on Scientific Research in Malaria Disease Control

Preamble:

As Coordinator of the Scientific Committee my main function is to keep abreast of developments of relevance to RAM emerging in the research, development and field deployment arenas, and to advise the RAM Executive and members of developments worthy of note. It should be noted that many scientific research projects are at the very early phase of academic curiosity and years away from any possible deployment in the field alongside our tried and true malaria minimisation and elimination strategies. As such the intention with this report is to focus on developments of practical relevance to current and future RAM endeavours. Whilst RAM has a focus on Timor Leste, the Solomon Islands, Papua New Guinea and, more recently, Vanuatu, this report will also touch on developments outside of countries of immediate focus if they have implications for our future activities. Broadly this report will touch on some of the following:-

- Malaria Elimination
- Drug and Insecticide Resistance
- Vaccine Development
- Diagnostic Methods
- Treatment and Therapy
- Epidemiology
- Vector Control

Malaria Elimination

Malaysia is set to achieve malaria elimination by 2020, 10 years ahead of schedule. Malaysia was once the home to some of Asia's highest rates of malaria infections, but had zero cases of indigenous malaria last year. The success is attributed to widespread mosquito net distribution and increased funding for malaria research through the Asia Pacific Malaria Elimination Network. Malaria rates have fallen by 59% between 2010 and 2017 throughout Southeast Asia.

Reference: [Global Citizen](#)

Each US\$1 spent on Thailand's malaria elimination strategy would return between US\$2 and US\$15, according to Thai and US researchers.

Reference: [The American Journal of Tropical Medicine and Hygiene](#)

Malaria elimination in Papua New Guinea can yield health, social and economic benefits nine times greater than the associated costs. Eliminating malaria in PNG by 2030 can lead to over 7,000 lives saved, 3.86 million cases averted and a 9:1 return on investment.

Reference: www.shrinkingthemalariamap.org

Drug and Insecticide Resistance

An “alarming” decline in the effectiveness of go-to malaria drugs in Southeast Asia could signal their eventual failure across the globe, according to 2 new studies. The Mekong Delta region has been the birthplace of resistance to many generations of malaria drugs; the current go-to artemisinin combination treatment is no different. One study found that the drug had a 50% overall failure rate; another tracked how resistance has spread from Cambodia to parts of Thailand and Vietnam. While the resistance is largely confined to the Mekong Delta region, there’s no reason these parasites can’t spread elsewhere.

References: [Wellcome Sanger Institute](#) and [Mahidol Oxford Tropical Medicine Research Unit in Bangkok](#)

Vector Control

The effort to strengthen vector control faces many challenges, including ensuring the effective deployment of current vector control interventions, the development and market access of appropriate new tools to address, for example, insecticide resistance and residual transmission, and maintaining capacity and expertise to ensure sustained impact of these tools against malaria and other vector-borne diseases. Partner organizations convened in Geneva recently for the 14th Annual Meeting of the RBM Partnership to End Malaria Vector Control Working Group. It drew more than 270 partners from 52 countries, endemic country programs (and their operational partners), research institutions and the private sector to share best practices around the challenges and opportunities faced in delivering on the WHO Global Vector Control Response.

The discussions highlighted promising signs, including the pipeline of new vector control tools (arguably richer now than ever), the emphasis on greater collaboration and an approach that recognizes the need for cross-sectoral engagement beyond the traditional scope of public health.

Reference: <http://www.rollbackmalaria.org/organizational-structure/working-groups/vcwg>

A warming planet means more mozzies: If greenhouse gas emissions continue apace, by 2050 49% of the global population will live among disease-spreading species *Aedes aegypti* and *Aedes albopictus*, according to new prediction models.

Reference: [Global Health News Wire](#)

Family Planning for Mosquitoes - As mosquitoes become increasingly resistant to existing control methods, “mosquito birth control” could be the future for controlling their numbers—and the deadly diseases they spread. Scientists at the University of Arizona scientists have found that by blocking a protein key to hatching their young, female mosquitoes could no longer lay viable eggs. It is hoped that within 5 years the discovery will usher in a new generation of insecticides, curbing mosquito-borne disease without harming bees and other beneficial insects—or wiping out mosquitoes entirely; after all, they are pollinators in the ecosystem.

Reference: [Thomson Reuters Foundation](#)

Epidemiology

Malaria's Sudden Surge in Burundi: Malaria has claimed more than 1,800 lives in Burundi so far this year—roughly the same toll as the yearlong Ebola outbreak in the DRC that has captured global attention. Cases of malaria have nearly doubled in Burundi this year to 5.7 million, according to a recent UN situation report. The country has a population of 11 million. The movement of people from mountainous areas where there is low immunity, along with climate change and a paucity of mosquito nets and other preventive resources are behind the surge in cases, according to the UN Office for the Coordination of Humanitarian Affairs.

Comment by Bruce: The Burundi situation is of potential relevance to RAM and to RAM PNG with movement of people from mountainous areas to lower lying areas.

Reference: [AFP via Al Jazeera](#)

Vaccines

A vaccine against fatal pregnancy malaria passed a phase 1 human-testing trial. The vaccine was shown to be safe and induced the right antibody response in a randomized, double-blind clinical trial. The discovery of a protein hook in the placenta of pregnant women that malaria parasites may attach to sparked the work. In the next phase, the researchers will work to document that it prevents pregnancy malaria in African women who would otherwise have contracted the disease.

Reference: [University of Copenhagen](#)

Diagnostics

A team in Kenya is collecting used rapid diagnostic test kits for a secondary analysis of malaria positive test to see if any of the malarial parasites detected are carrying genes that have been shown to be involved in the development of resistance to the artemisinin combination therapy widely used in sub-Saharan Africa. Of 1,390 used kits positive for malaria-causing parasites, 13 to 87 percent contained genes for causing antimalarial resistance. The aim of the exercise is to stay at least one step ahead by varying the treatment regime in particular areas if resistance begins to develop to the existing drugs.

Comment by Bruce: This work is very preliminary and the results can vary widely depending upon how well the used diagnostic tests are handled and stored before the secondary screening for drug resistant genes.

Reference: [SciDev.Net](#)

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