

RAM Scientific Committee Coordinator Report September 2020

Scientific Developments (not exhaustive):

a) Vaccine Future Use Scenarios

In 2014, the WHO set the preferred characteristics of malaria vaccines: with an efficacy of 85% and duration of protection of a least two years ([World Health Organisation, 2015](#)). Widespread use of a malaria vaccine with these characteristics, if achieved, would offer the prospect of malaria elimination through “sterilisation immunity” but field trials of candidate vaccines, including the RTS,S vaccine with adjuvant AS01 (RTS.S/AS01) have fallen short of the 85% efficacy and two year protection target. Accordingly, attention has now turned to how best to use vaccines with lesser efficacy and shorter protection times in combination with other malaria reduction and intervention strategies to achieve the best overall malaria “health goals” in different settings. In a recent paper (Follow this link: [Future use-cases of vaccines in malaria control and elimination](#)) the authors used modelling to assess the effects of mass vaccination alone (with a partially protective vaccine), mass drug administration alone, or a combination of both interventions over a range of coverage and transmission scenarios across a three-year period. The results suggest that if interruption of transmission is not achieved prevalence resurges to initial levels after intervention ceases, and there is added benefit to consider dual rollout of mass drug administration and anti-infective vaccines when they become available.

Relevance to RAM: Even when malaria vaccines become available their use in the field will not be straightforward. The use of vaccines will have to be combined with other interventions such as vector control, chemoprevention and chemotherapy to achieve overall “malaria health” goals rather than specific efficacy and duration targets alone.

b) Artemisinin Resistance Emerges in Africa:

Cases of resistance to the anti-malarial drug Artemisinin were identified in Rwanda for the first-time last month, the first emergence of such resistance in Africa. The resistant parasites found in Rwanda did not spread from Asia where Artemisinin resistance is widespread but developed locally. The spread or independent emergence of artemisinin resistance could pose a global public health threat as no alternative treatment is as efficient or tolerable, according to the WHO.

Link: https://www.scidev.net/global/malaria/news/malaria-artemisinin-resistance-emerges-in-africa.html?utm_source=Global+Health+NOW+Main+List&utm_campaign=3c95afe781-EMAIL_CAMPAIGN_2020_08_26_03_40&utm_medium=email&utm_term=0_8d0d062dbd-3c95afe781-2883217

Relevance to RAM: At present there are no convenient drugs other than Artemisinin for the treatment of the most severe cases of malaria, although Intravenous (IV) artesunate received approval from the U.S. Food and Drug Administration in May 2020. Detailed drug discovery studies continue to identify promising leads for potential therapeutic drugs. However, any such therapies are still a long time away from surviving the drug development and registration process. In the meantime, RAM will have to continue doing the best we can with the traditional tools available (bed nets, residual indoor spraying, breeding site destruction, etc.).

c) When is a Parasite-Infected Mosquito an Infectious Mosquito?

There is a discrepancy between exposure to infected mosquito bites and malaria incidence which raises the question of the minimum salivary gland sporozoite density that is required to achieve malaria infection following a mosquito bite. Oocyst prevalence on mosquito midguts and sporozoite prevalence in salivary glands are commonly used to confirm successful malaria transmission, assuming that these are reliable indicators of the mosquito's capacity to give rise to secondary infections. In a recent paper potential bottlenecks for successful transmission were investigated, leading to the conclusion that a better understanding of the events that lead to successful inoculation of sporozoites by mosquitoes is critical to designing effective interventions to shrink the malaria map.

Link: <https://doi.org/10.1016/j.pt.2020.05.011>

Relevance to RAM: No direct relevance in the short term but something to keep in mind if our next PhD project extends research into mosquito biting behaviour and secondary malaria transmission rates.

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