Protecting the most vulnerable

Despite the intensive efforts of the global malaria research community, the challenges of developing a malaria vaccine with at least 75% protective efficacy[1] have yet to be overcome. In the absence of such a vaccine, the WHO recommends seasonal malaria chemoprevention (SMC) for young children[2] and intermittent preventive treatment (IPTp) for pregnant women. MMV and its partners are working hard to maximize access to currently available quality-assured preventive antimalarials while seeking new alternatives for these vulnerable groups.

Seasonal malaria chemoprevention

In 2012, the WHO recommended SMC to protect children aged 3 months to 5 years in areas of seasonal malaria transmission in the Sahel region of sub-Saharan Africa. The medicine used for SMC, sulfadoxine-pyrimethamine plus amodiaquine (SPAQ), is administered once a month throughout the rainy season, and in clinical trials has demonstrated a 75% reduction in the incidence of all malaria.[3]

In 2018, 81 million monthly courses of SPAQ treatment were shipped during the SMC season – estimated to have provided protection for more than 20 million children and bringing the total number of treatment courses distributed since its launch in 2014[4] to 250 million.

Only one WHO-prequalified SPAQ product is currently available. To increase the number of quality-assured suppliers and thereby help to provide security of supply, MMV is supporting S Kant Healthcare to develop its child-friendly, taste-masked, dispersible SPAQ product. On 19 February 2019, The Global Fund's Expert Review Panel (ERP) granted approval of S Kant's SPAQ,[5] which allows international organizations to procure the product while it undergoes WHO-PQ evaluation (the dossier was submitted to WHO in July 2018). In 2019, S Kant aims to attain market approval of the product in four countries, with the first deliveries occurring by year end.

Over the next 5 years, MMV's SEAMACE[6] programme will explore the possibility of reaching up to 9 million additional children in 15 eligible countries in the Sahel region.[7,8] To mitigate against the risk of resistance to sulfadoxine–pyrimethamine (SP) and permit the potential expansion of SMC to other regions of Africa impacted by seasonal malaria, MMV is considering new combinations of existing therapies as alternatives to SPAQ. In addition, MMV is investigating new treatment strategies for long-duration prophylactic treatments (>1 month), including intramuscular formulations of prodrugs[9] and potential new therapies based on monoclonal antibody technology.[10]

Intermittent preventive treatment in pregnancy

The WHO recommends IPTp using SP for all pregnant women during antenatal visits, starting as early as possible in the second trimester. Despite adoption of this policy in 39 African countries, access to IPTp remains disappointingly low. According to the World Malaria Report 2018, among the 33 countries that provided data in 2017, only ~22% of eligible pregnant women received the three recommended doses of IPTp, clearly showing the extent of the coverage gap.

MMV is exploring ways to close this gap by strengthening SP supply chains, and by improving acceptance and compliance among pregnant women taking SP. MMV is working to develop adapted packaging for quality-assured IPTp. So far, this new packaging has been tested in Democratic Republic of the Congo, Nigeria and Mozambique, helping to improve perceptions of SP as a quality medicine for chemoprevention during pregnancy.

Furthermore, for regions where SP resistance is a concern, MMV is working to identify potential substitutes for the drug in IPTp, including supporting work to repurpose existing treatment drugs. In 2014, a study to assess the cardiac safety of Eurartesim® (dihydroartemisinin-piperaquine) in pregnant women began in Tanzania to evaluate its potential as an alternative to SP.[11]

1 WHO Preferred Product Characteristics (PPC) for Malaria Vaccines, 2015: https://www.who.int/immunization/documents/innovation/WHO_IVB_14.09/en/
2 The WHO also recommends intermittent preventive treatment in very young children, aged 3–9 months.
3 WHO policy recommendation: seasonal malaria chemoprevention (SMC) for *Plasmodium falciparum* malaria control in highly seasonal transmission areas of the Sahel sub-region in Africa, 2012: https://www.who.int/malaria/publications/atoz/smc_policy_recommendation_en_032012.pdf?ua=1
4 Fosun Pharma's SPAQ product achieved WHO prequalification in October 2014.
5 ERP approval of SPAQ valid until 18 Feb 2020.
6 SEAsonal MAlaria Chemoprevention Extension.
7 Areas eligible for SMC are those where the majority of malaria transmission falls within a short rainy season of no more than four months, and where resistance to SMC drugs is low.
8 Depending on WHO review, the outcomes of SEAMACE may translate into SMC policy changes.
9 Prodrug: a precursor of a drug that must undergo chemical conversion by metabolic processes in the body before becoming an active pharmacological agent.
10 This was the subject of a recent review paper authored by a team of MMV's in-house scientists: Macintyre F *et al.* "Injectable anti-malarials revisited: discovery and development of new agents to protect against malaria." *Malar J.*17(1):402 (2018).
11 This study is being conducted by MMV in partnership with the London School of Hygiene and Tropical Medicine, UK.

Tenin's story

Living happily, protected from malaria

Tenin Keita is 3 years old and lives with her family, including her baby brother Moussa, in the Dabola prefecture of the Faranah Region of Guinea. This region is plagued with malaria, especially during and just after the rainy season from July to October. Today, SMC is being rolled out to protect children like Tenin and her brother from malaria, and the results are impressive. Tenin and Moussa's mother, Fatoumata Binta Diallo, happily explains that none of her children suffered from malaria in 2018.

This wasn't always the case. The year before there had been many more cases of malaria in the village. "Yes, it's changed," explains Fatoumata. "My neighbour's daughter was really very ill last year. Now she's ok. She's been better since we got the medicines. The children don't cry, it's fine. They take them without any problem."

SMC was provided to all eligible children in the Dabola prefecture, Guinea, for the first time in 2018. The director of the Dabola area hospital explained that there had been a 25% reduction in malaria-related hospital admissions between 2017 and 2018 – since the implementation of SMC. As a practical illustration, he also noted there had been an important decrease in the demand for blood bags for transfusion, which he attributed to a decrease in the number of children with severe anaemia caused by malaria.

↓ 3-year-old Tenin Keita

↑ A healthcare worker prepare the medicines for Tenin and Moussa

→ Tenin receives her dose of SPAQ