Facilitating equitable access

Advancing access to life-saving severe malaria medicines

**ISSUES**

In 2016, an estimated 445,000 people lost their lives to malaria, 90% in Africa. If left untreated, uncomplicated malaria can progress within a few hours to severe malaria — a condition that can kill. In 2011, the World Health Organization (WHO) recommended that severe malaria be treated with injectable artesunate (Inj AS) in preference to quinine or artemether, as it saves more lives.

As time is of the essence when treating severe malaria, the WHO also recommends the use of rectal artesunate (RAS) for pre-referral management of the disease in areas where comprehensive treatment and care cannot immediately be provided. A single dose of RAS significantly reduces the risk of death and permanent disability. Despite this recommendation, until 2018 no WHO-prequalified product existed, severely limiting its use.

S
ince Guilin Pharmaceutical’s MMV-supported Inj AS product, Artesun®, was WHO-prequalified in 2011 and made accessible to countries, more than 100 million vials of Artesun have been dispatched, saving an estimated 650,000 additional young lives compared to treatment with quinine.

Funded by Unitaid, MMV successfully supported scale-up and use of the drug through the Improving Severe Malaria Outcomes project in six African countries between 2013 and 2016. To ensure a sustainable global supply of quality Inj AS, MMV also worked with Ipca Laboratories, India, to submit its dossier to the WHO for prequalification in 2016.

Extending access to Inj AS, however, is only part of the story. The first point-of-care for many patients with severe malaria is a community-level healthcare worker or a primary care facility. Most of these local health posts do not have Inj AS in stock or personnel trained in its administration. As a result, patients have to be referred to higher-level facilities, creating delays in access to immediate treatment. In such cases, the WHO recommends RAS as a life-saving pre-referral intervention. Specifically, RAS is recommended for “pre-referral treatment of severe malaria in children under 6 years of age in remote areas, so that cases of suspected malaria, for example, at community level can be treated without delay, pending immediate transfer to a higher-level facility where comprehensive care can be given.” As such, RAS buys time until Inj AS can be administered and can mean the difference between life and death. As soon as the child begins to recover and is able to take oral medication, they then receive a full course of artemisinin-based combination therapy (ACT).

**ACTION**

→ Enable two pharmaceutical partners, Cipla and Strides Shasun, to develop and obtain WHO prequalification for RAS products.

→ Optimize the correct use of Inj AS and RAS in low-resource settings in Africa to help reduce mortality and neurological damage caused by severe malaria in affected children.

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3 In association with consortium partners Clinton Health Access Initiative (CHAI) and the Malaria Consortium (MC).
4 Nigeria, Cameroon, Ethiopia, Kenya, Malawi and Uganda.
Once again supported by Unitaid, MMV has been working with two Indian pharmaceutical companies, Cipla and Strides Shasun, to develop and obtain WHO prequalification for RAS products and thus create a sustainable supply. In 2016, the Expert Review Panel (ERP) of The Global Fund issued a 12-month authorization for procurement of Cipla’s product and then in 2017 for the Strides Shasun product, making RAS available to countries while awaiting prequalification. This allowed the first order of ~500,000 suppositories to be placed with Médecins Sans Frontières, President’s Malaria Initiative, The Global Fund and UNICEF. In early 2018, the Cipla product received WHO prequalification – a landmark moment – making it the first RAS product to receive this international stamp of quality.

MMV’s work in severe malaria has now extended to support the manufacturers with the registration of RAS in several high-burden African countries.7 In parallel, in July 2017, MMV joined forces with international development organization Transaid, in collaboration with the National Malaria Elimination Centre (NMEC) of Zambia on a project known as MAMAz8 Against Malaria (MAM) to improve severe malaria case management, in particular by introducing RAS at the community level. Implemented with several partners,9 the MAM project adopts innovative approaches, including the use of bicycle ambulances, as well as community theatre, song and dance to create awareness of malaria danger signs (see pp. 16–17 for real stories).

What is the goal of MAM in Zambia and how will it be achieved?

We’re trying to reduce the number of children under 6 dying from severe malaria. We’re doing this through a pilot scheme in the Serenje District of Zambia to test the effectiveness of methods to improve case management of severe malaria using RAS and Inj AS.

The project was designed based on the “three delays” model, which states that delays in accessing treatment can occur first through the initial decision to seek care at the household level, second, in getting to the health facility and, third, the timeliness and quality of care received on arrival. In response, we’re using community activities like discussion groups and theatre to raise awareness of the malaria danger signs and to inform caregivers when to seek medical care; we’re training community healthcare volunteers (CHVs) to administer RAS and putting in place an emergency transport scheme using bicycle ambulances; and we’re ensuring healthcare workers know how to administer Inj AS at the health facilities.

The goal is that CHVs are able to recognize the danger signs, test for malaria using a rapid diagnostic test and administer RAS before the child is taken by bicycle ambulance to the district health facility where staff can administer Inj AS. When they are safe and return home, the CHV can then also continue to follow their progress.

What impact has the project had so far?

We started in July 2017 and the project will run until July 2018. As of March 2018, we have trained a pool of master trainers and begun mobilizing the communities. RAS has been successfully procured, and we’re seeing demand for it. We’re on track for the project goal for 750 children to receive RAS, with 486 having already benefited. All of these children were referred and 95% followed up afterwards. Based on baseline data, we estimate that so far the project has saved around 37 children’s lives. This is based on underestimated baseline data since many deaths in the community are not reported.

Why is the availability of RAS so important?

RAS is making a huge difference: the CHVs who live in the community have it and are ready and know how to use it. The product is really being accepted by the community, including the district management team and the traditional village chiefs, because they are seeing that it works. They see the children in their village respond in just a few hours, or a day, and that they recover rapidly from severe malaria.

What are the next steps? How will this project be transitioned for national scale-up?

It’s still early days. We will need to wait until the end of the project to see the full results, but we do have promising early results so we’ve begun paving the way for scale-up. We are implementing a statistical endline survey to ensure robust evidence of the impact and have started wider dissemination, including at the Evidence for Impact conference held in Zambia in March 2018. We’ve already produced a community training manual on RAS and would like to incorporate this into the national guidelines. The RAS and Inj AS trainers in Serenje will also be able to help train other districts. We’re also very keen to see RAS included in national malaria procurement guidelines. We very much hope the project will be scaled up nationally and are working closely with the NMEC to explore how this can be done.

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7 RAS has been submitted for registration in Uganda and Nigeria and has been achieved in DRC.
8 MAMAz: Mobilizing Access to Maternal Health Services in Zambia programme was led by Health Partners International (2010-2013), funded by DfID and MORE MAMAz, led by Transaid (2014-2016), funded by Comic Relief.
9 MAM partners: Transaid, Health Partners Zambia (HPZ), and the Zambian organizations Development Data and DisaCare, together with MMV.
Alexandria’s story

One-year-old Alexandria Katontoka from the Serenje District of Zambia fell sick on 13 December 2017 at around 10.00 am. He stopped playing with his friend and fell asleep near the doorway of his house. While picking up her (seemingly) sleepy son, Sharon Musonda realized his body temperature was very high. Worried, she immediately set off to see the CHV, Charity Mumba. With a rapid diagnostic test confirming Alexandria had malaria he was given an antimalarial and paracetamol and taken home.

At around 3.00 pm Alexandria’s big brother came running to Charity’s home in tears. He said that Alexandria had died, and he had been sent to call her. Charity ran into her house to pick up her test kits and RAS. When she arrived, Alexandria was lying on a blanket on the floor with his eyes closed. His mother, Sharon, explained that he had started vomiting severely and had been having fits.

Charity immediately administered RAS and advised for preparations to be made to go to the hospital. Just 5 minutes later, Alexandria opened his eyes and started to cry. Charity’s husband then called for a bicycle ambulance, which transferred Sharon and Alexandria to the local health facility within 2 hours.

On arrival at the facility, Alexandria was given three courses of Inj AS and the following day could be discharged, with a course of ACT and vitamins to be taken at home. Although it took him almost a week to walk properly, thanks to the follow-up visits by Charity, we know he has now fully recovered. RAS gave Alexandria a second chance to live.

MMV launched the Severe Malaria Observatory (SMO) in August 2017 to provide an open-access, knowledge-sharing platform for the global malaria community. As we work towards enhanced malaria control and eventually malaria elimination, it is becoming increasingly important to share knowledge, experience and guidance for the benefit of all. Through the SMO we hope to:

- disseminate best practices, toolkits, market information, guidelines, projects, outcomes etc.
- bring attention to the need for continuous research and capacity building
- support visibility and coordination of ongoing initiatives to address severe malaria.

The SMO is hosted and maintained by MMV, and populated with information made available by the global malaria community. As of March 2018, the SMO had received more than 11,500 individual views.
Josephine Mupeta lives in the Serenje chiefdom, a small community in the district of Serenje, Zambia. Josephine proudly explains, “I am a community health volunteer (CHV). I help children in my community who are sick with suspected severe malaria.”

Previously, severe malaria had a particularly devastating effect in the Serenje chiefdom. “A few years ago, we had one month where ten children died from severe malaria. But since the MAMaZ Against Malaria (MAM) project started here, not a single child has died of severe malaria, and the community is aware of the danger signs.”

One of the ways Josephine and her fellow CHVs educate their community on severe malaria is via song. Catchy and beautiful songs are accompanied by movements illustrating the danger signs.

Being a CHV is only one part of Josephine’s role in the MAM project. “I am also an emergency transport scheme bicycle rider. I have transported six children with suspected severe malaria to the health facility during this rainy season, as well as a number of women experiencing maternal complications.” Whilst Josephine makes this sound easy, the reality is that the journey would be challenging even in a 4 x 4. While the journey is arduous, the alternative would be for a parent and sick child to walk or, worse still, stay at home.

Josephine regularly receives visits from her neighbours. “Up to 15 people come to my house per day; per week I see about 50 people.” People see her as a source of knowledge, not only for malaria but for a range of illnesses. Her role is purely voluntary. She makes her living and feeds her family via her small farm.

So why, given her busy job as a farmer, did Josephine become a volunteer for the MAM project? “My elder sister died during pregnancy,” Josephine explains. “When she was in labour, there was a complication and there was no means of transport to take her to the health facility, and it was so far away.” By the time transport had been found, Josephine’s sister had passed away. “If a bicycle ambulance had been available to us at that time, my sister would still be alive today.”

“The bicycle ambulance is the best thing that has happened to this community. I see people going about their daily lives in my community who otherwise wouldn’t be alive today.”

Since the MAM project started here, not a single child has died of severe malaria.
Providing treatment options today for children with uncomplicated malaria

**ISSUE**
There are still relatively few child-friendly antimalarial formulations available today. As a result, many children still receive adult formulations – usually tablets that need to be crushed and which taste bitter, causing children to either refuse the medicine or to vomit on administration. This can lead to underdosing, resulting in incomplete cure, which in-turn can promote drug resistance.

**ACTION**
MMV and partners prioritize the development of child-friendly antimalarials and the generation of evidence of their use in real-life settings to support increased uptake.

Almost 10 years ago, MMV and its partner Novartis introduced Coartem® Dispersible (artemether-lumefantrine) – the first high-quality, child-friendly artemisinin combination therapy (ACT).

Since then, 350 million treatments have been delivered to endemic countries. In 2015, Pyramax® granules (pyronaridine-artesunate), co-developed by Shin Poong Pharmaceutical and MMV, became the second antimalarial for children to emerge from MMV’s pipeline, and the first to receive a positive scientific opinion from the European Medicines Agency (EMA) under Article 58. This paediatric formulation was added to the WHO List of Prequalified Medicinal Products in 2016 and to the WHO Essential Medicines List for Children (EMLc) in 2017. Alfasigma S.p.A., MMV’s partner and the manufacturer of prequalified, EMA-approved dihydroartemisinin-piperaquine (Eurartesim®), plans to submit a dossier to the EMA for the approval of a third child-friendly medicine, Eurartesim® paediatric, in 2018.

Despite this progress, some countries opt for bitter adult medicines, for cost reasons. Thus, children might not always receive the complete cure they need. It’s imperative that countries prioritize paediatric formulations to give children the best chance of surviving the disease.

To support optimal use of all available high-quality medicines, MMV is working with partners to generate and disseminate post-approval evidence of their safety and efficacy in the real world, especially in children. The West African Network for Clinical Trials of Antimalarial Drugs (WANECAM) carried out the first trial to investigate and confirm the real-life safety and effectiveness of four ACTs, when used for repeated treatment over a 2-year period. Further to this study, the Central African Network on Tuberculosis, HIV/AIDS and Malaria (CANTAM) is conducting a post-approval study exploring the safety and tolerability in real-life settings of Pyramax tablets and granules in adults and children.
What are the unmet treatment needs in malaria for infants and children, and how do child-friendly medicines help?

At the moment, there are limited child-friendly antimalarial options and a lack of evidence-based guidelines for treatment of malaria in the very young (≤ 6 months of age or ≤ 5 kg). Incorrect treatment – for example the wrong dose or failure to take the full course of treatment – can increase the risk of severe malaria and death in this already vulnerable population.

Formulations that make treatment easier to administer have received a positive response from caregivers and patients alike. It is of paramount importance to have good child-friendly formulations available to improve compliance.

Why is it important to have a range of quality-assured treatment options for children?

First, quality-assurance of treatments by the WHO and inclusion in the Model List of Essential Medicines for Children are important steps in the process of improving uptake of child-friendly medicines. Second, giving non-child-friendly medicines to children significantly increases the risk of non-compliance, and, as a consequence, the risks of severe malaria and death. Third, the availability of multiple first-line treatment combinations, and partner drugs with different mechanisms of action, might also delay the appearance of resistance.

The introduction of Pyramax granules will provide additional treatment options for children in Central Africa. Pyramax tablets and granules provide particular benefit as dosing is unaffected by food intake, an important consideration in this region.

The cost of the child-friendly formulation compared with the adult one is a potential limitation, however, as some regions may be less likely to switch to the more expensive formulation. MMV has already had a positive impact in this area by increasing the market supply of child-friendly formulations, but it is important that this and other work to address the issue continues.

What is the goal of the CANTAM study and how is it progressing?

The CANTAM study is a phase IIIb/IV study, designed to gather safety and tolerability information about Pyramax in ‘real-life’ settings, including in young children (under 1 year). The study was requested by the EMA to be carried out in parallel to the launch/scale-up of Pyramax in malaria-endemic countries.

The increased breadth of pharmacovigilance and range of safety data collected is expected to support the wider uptake of both Pyramax tablets and granules at country level.

Recruitment has been progressing very well, with over 3,000 patients, including 70 children under 1 year of age, recruited by the end of May 2018 in the five participating countries, including almost 800 in Gabon, up to April 2018 (planned recruitment: 8,572 malaria episodes). The results are expected in 2020.

What is it like to partner with MMV on this study?

It is a privilege to partner with MMV. MMV’s involvement with antimalarial trials and their drug development pipeline are very important factors. The improved laboratory facilities and good clinical practice-compliant environment created for the study with support from MMV, make a great contribution to capacity building in our African research settings – I look forward to further collaborations with MMV.

1 Pyramax® granules is the paediatric formulation of Pyramax®, which is presented as a tablet formulation.
Seasonal malaria chemoprevention (SMC) was recommended by the World Health Organization (WHO) in 2012 to protect children from being infected in areas of high seasonal malaria in the Sahel region of Africa. However, in 2014, fewer than 5% (~3 million) of all eligible children benefitted from SMC. At this time, there was no child-friendly formulation available either, making administration a challenge. Infants and very young children are generally unable to swallow pills; as such, tablets needed to be crushed and mixed with water before administration, leading to possible under-dosing. Some tablets also had an unpleasant bitter taste, causing children to spit them out.

MMV’s partner Guilin Pharmaceutical has developed a child-friendly dispersible formulation for the oral administration of sulfadoxine–pyrimethamine and amodiaquine (SPAQ). As part of the Unitaid-funded ACCESS-SMC project initiated in 2014, MMV has been contributing to efforts to overcome barriers to the scale-up of SMC. The project was completed in 2017, and MMV continues to support SMC scale-up in the Sahel region. MMV is working with manufacturers to increase the supply of child-friendly SMC medicines and is working towards the development of a new generation of drugs for this intervention.

SPAQ is a cost-effective drug combination shown in clinical trials to prevent approximately 75% of malaria episodes during the transmission season. Currently, MMV’s partner Guilin Pharmaceutical is the sole prequalified supplier of SPAQ. In 2016, Guilin’s child-friendly formulation became the first paediatric SPAQ product to be validated by The Global Fund Expert Review Panel for purchase by international donors. To ensure a sustainable supply of dispersible SPAQ, MMV is supporting a second manufacturer, S Kant HEALTHCARE Ltd. (India), to obtain WHO prequalification of its product. In parallel, MMV is leading the collection of scientific and stakeholder input on the desired attributes of next-generation SMC drugs as alternatives to SPAQ.

Working closely with national malaria control and elimination programmes across the Sahel region, MMV is part of the SMC working group created to coordinate countries’ efforts to adopt and implement SMC policy. It has also developed a multi-country forecasting tool to improve stock management of SMC drugs, tracking key data by year, country, number of eligible children and drug volumes required.

To date, 12 countries have integrated SMC into the package of interventions provided by community health workers and volunteers. Based on data from studies in five ACCESS-SMC countries, SMC was associated with an 89% reduction in malaria incidence for 4 weeks after treatment (62% from 5 to 6 weeks after treatment), compared with children who had not received SMC or whose last dose was more than 6 weeks earlier. Furthermore, 180 million courses of monthly treatment have been delivered to children in over 12 countries in the Sahel region since the 2014 scale-up, to the end of 2017, of which 68 million were delivered in 2017, enough to protect 17 million children.

180 million courses of monthly treatment have been delivered to children in over 12 countries in the Sahel region since 2014.

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3 The UNITAID-funded ACCESS-SMC Consortium includes: the Malaria Consortium (prime recipient), Catholic Relief Services (joint lead), MMV, Management Sciences for Health, Speak Up Africa and the London School of Hygiene & Tropical Medicine.
4 Burkina Faso, Cameroon, Chad, Gambia, Ghana, Guinea, Guinea Bissau, Mali, Niger, Nigeria, Senegal and Togo.
What has been the impact of SMC in Niger so far?
Since the implementation in 2013, based on testimonials from health workers and mothers, we have seen a decrease in the number of severe malaria cases and deaths, as well as a reduction in attendance at health facilities during high-transmission periods. However, we cannot say definitively that this is due to SMC – we will have to do an impact study in 2018 to validate this.

What were the main challenges you faced in implementing SMC? How did you overcome them?
In previous years, the main challenges were the coordination and harmonization between various partners, each with their own procedures and requirements, as well as variance in epidemiological data obtained using multiple data-collection tools. Before the introduction of the dispersible formulation, we also observed enormous problems in treatment compliance from patients, difficulty in administration (due to a sugar shortage), as well as limited availability of the drug. These challenges resulted in significant additional costs.

The Ministry of Public Health has since set up an SMC-coordinating committee to plan, supervise and oversee the project. It will standardize data collection tools and disease awareness materials, synchronize campaigns with neighbouring countries, as well as manage stock levels.

What has been the impact of the dispersible formulation in Niger?
With the ease of administration of the dispersible formulation, we have seen better acceptance by children, with less vomiting and rejection. There are also significant reductions in cost and logistics associated with removing the need for a pestle and mortar, and consumable items such as sugar.

With the ACCESS-SMC project now complete, what are the next steps in implementing SMC in Niger?
SMC started in Niger in 2013 with the support of Médecins Sans Frontières, and subsequently received support from UNICEF, The Global Fund, Islamic Relief Niger, the ACCESS-SMC project, and the P/MTN5 malaria project until 2016. In 2018, with the support of The Global Fund, President’s Malaria Initiative, UNICEF and other partners, we plan to increase access to SMC in the 61 eligible districts in Niger.

Important next steps include continued effort to scale-up SMC, advocacy for strong resource mobilization, and a strategy for cross-border distribution of treatment.

What characteristics should a future SMC drug possess?
An ideal SMC product should be a single-dose dispersible formulation that does not have a bitter taste for children. This would allow a more efficient, directly-observed administration compared with the current schedule of three doses over 3 days.

What are your hopes for the future of SMC in Niger and in the Sahel region?
SMC in children of all ages is key if we are to move closer to malaria elimination in the Sahel region. It is my hope that the implementation of SMC through cross-border activities and synchronization with other countries will make it possible for SMC to prevent malaria in the maximum number of children.
Improving malaria treatment during pregnancy

Due to a shortage of safety data on pregnant women for most of the currently recommended malaria treatments, there are limited treatment options for this vulnerable population, particularly in the first trimester.

nnually, around 125 million pregnancies around the world are at risk from malaria. Pregnant women with malaria face an increased risk of life-threatening outcomes, including cerebral malaria or severe anaemia, as well as unfavourable pregnancy outcomes such as miscarriages, premature delivery and low-birth-weight babies. Artemisinin-based combination therapy (ACT) should be used for the treatment of malaria during the second and third trimesters of pregnancy, while quinine remains a second-line therapy with notable drawbacks (primarily tolerability and slow speed of parasite clearance). During the first trimester of pregnancy, quinine in combination with clindamycin remains the recommended drug, due to a historic lack of safety evidence regarding the use of ACT in this delicate period of foetal development.

Recent expert guidance, based on newly accumulated safety data showing that treatment with artemisinin in the first trimester is not associated with an increased risk of miscarriage or stillbirth compared with quinine, has led the World Health Organization (WHO) to consider recommending ACT as a first-line therapeutic option for uncomplicated malaria during all trimesters of pregnancy.

While there is comparatively rich data on the safety of artemether-lumefantrine (one of the most widely used ACTs) in treating pregnant women in the first trimester of pregnancy, there is much less data today demonstrating comparable safety with dihydroartemisinin-piperaquine (DHA-PQP) and other ACTs. To address this gap, MMV is supporting a study in Indonesia with the Liverpool School of Tropical Medicine in conjunction with the Timika Research Facility, Indonesia, to gather significantly more data – retrospectively and prospectively – on the safety of DHA-PQP during all trimesters of pregnancy.

What are the risks for pregnant women with malaria infection?

The risks depend on several factors, such as the epidemiology of malaria in the country, the parasite species, the level of malaria transmission in the country and whether it is seasonal or perennial.

In high-transmission areas, most women develop partial immunity by the time they reach reproductive age. In low-transmission areas, however, young women do not develop immunity, and are therefore prone to malaria infections, leading to possible preterm or low-birth-weight babies, or even stillbirths.

For those with chronic infections, both mother and infant are at risk of developing severe anaemia. It can affect the foetus in utero through to birth and even into childhood.

What are the challenges with the current options for protection and treatment of pregnant women?

The currently recommended regimen for intermittent preventive treatment in pregnancy (IPTp) is sulfadoxine-pyrimethamine (SP) in eligible African countries, but there is no such IPTp recommendation for malaria-endemic countries outside of Africa. When we screen and treat in Indonesia at the first antenatal visit, the drug of choice is an ACT, which is to be used only during the second and third trimesters. We therefore need a drug suitable for use during the first trimester as well as options that could be considered for IPTp.

Why is DHA-PQP being studied in pregnant women in Indonesia?

Indonesia was one of the first countries to introduce a national policy, in 2006, for the use of DHA-PQP for the treatment of malaria in adults and pregnant women in their second and third trimester. Many women could thus have been inadvertently exposed to this drug early in their first trimester while being unaware of their pregnancy. As such, a wealth of data regarding the effect of the use of DHA-PQP during the first trimester must exist.

References:
How is this study being conducted?

There are two components to our study: retrospective and prospective.

The retrospective part started in October 2017. For this, we access data between 2006 and 2017 from two main hospitals, and gather data relating to pregnant women who received DHA-PQP in their first trimester, either inadvertently or as a drug of choice. We then compare data on pregnancy outcomes and risks of congenital anomalies in these women with data from women who received quinine in their first trimester.

The prospective component of the study began in January 2018. For this, we enrol women in early pregnancy and treat them with DHA-PQP if they have confirmed malaria. These women are closely monitored until delivery, for pregnancy outcomes. One of the reasons for this close monitoring is that in the retrospective arm, despite having 10 years of data, we may not find sufficient data on women who had early miscarriages as they might not have gone to the hospital. We may also have missed women who had stillbirths, as home delivery is common in rural settings.

What is it like working with MMV on this project?

This is our first collaborative project with MMV. MMV has been very supportive of innovative work in the field of malaria and has shown a lot of interest in this project. We look forward to sharing the findings of this study, which will be particularly beneficial for pregnant women living in areas of malaria transmission.

Protecting pregnant women

To protect pregnant women from contracting malaria, the WHO recommends the use of SP as IPTp for eligible countries in Africa; however, its acceptance and use is low. In addition, there are concerns that this drug may eventually fail to provide adequate protection.

Funded by Unitaid, MMV has been working with partners to improve coverage of SP for IPTp in Africa, as well as ensuring an adequate WHO-prequalified supplier base, which will include African manufacturers.

Furthermore, in an effort to identify alternative drug options for IPTp, MMV is conducting a safety study of DHA-PQP in pregnant women in Tanzania; this study is being carried out by the London School of Hygiene & Tropical Medicine, in conjunction with the Kilimanjaro Christian Medical Centre.
