

Expanding seasonal malaria chemoprevention in new geographies

Lessons from Mozambique

Contents

- 2** Introduction
- 2** About SMC
- 2** Malaria Consortium's leadership
- 2** Mozambique's malaria context
- 3** From research to scale
- 3** Tailoring SMC to the local context (2020)
- 5** Establishing and refining SMC implementation (2020–2022)
- 7** Adapting to scale (2023)
- 8** Reflections on delivering SMC at scale
- 11** Recommendations
- 12** Looking ahead
- 14** References



Introduction

Since its recommendation by the World Health Organization (WHO) in 2012, seasonal malaria chemoprevention (SMC) has become a cornerstone of malaria prevention in areas of sub-Saharan Africa that experience highly seasonal malaria transmission. Initially implemented across the Sahel region of West and Central Africa, SMC has proved to be effective in preventing malaria infection in young children and is now recommended for adoption across other malaria-endemic areas in Africa where malaria morbidity and mortality are high, and malaria transmission is seasonal.

Mozambique was the first country outside of the Sahel to successfully scale up SMC. In this learning paper, we outline the lessons observed from the scale-up of SMC in Mozambique and provide recommendations for similar scale-up in comparative contexts.

About SMC

SMC is a community-based intervention that involves administering intermittent doses of antimalarial medicines to susceptible populations during peak transmission seasons, maintaining therapeutic drug levels to prevent cases.

The WHO initially recommended the scale-up of SMC focusing on children aged 3–59 months in the Sahel region of West and Central Africa in 2012.^[1] Today, the use of SMC as a malaria prevention strategy is guided by the WHO's Consolidated Guidelines for Malaria, which emphasise the need for malaria-endemic countries to adapt malaria strategies to their specific context and epidemiology.^[2] The guidelines no longer define geographic restrictions for SMC.

Malaria Consortium's leadership

Malaria Consortium is a leader in reaching communities with limited access to health services and those at greatest risk of exposure to disease, including children under five.

We expand our reach by building on our organisational experience of implementing proven health interventions in new geographies and populations.

Malaria Consortium is a leading implementer of SMC. Along with other partners, we have demonstrated how SMC can be delivered safely and effectively at scale, and adapted to diverse settings. Multi-country evaluations of the Achieving Catalytic Expansion of SMC in the Sahel (ACCESS-SMC) project, which was led by Malaria Consortium, showed that SMC was effective in preventing morbidity and mortality from malaria, with few serious adverse reactions reported. SMC campaigns are implemented under the leadership of national malaria programmes and through countries' existing health system structures.

In 2024, Malaria Consortium's SMC activities targeted around 24 million children across seven countries in sub-Saharan Africa: Burkina Faso, Chad, Mozambique, Nigeria, South Sudan, Togo and Uganda. It is through our commitment to rigorous research that we have sought to establish the future of SMC by assessing its utility in new geographies, including Mozambique.

Mozambique's malaria context

In Mozambique, malaria continues to be a leading cause of morbidity and mortality, with 9.3 million cases and 11,940 malaria deaths in 2023.^[3] The mortality rate for children under five is high (69.6 deaths per 1,000 live births), likely due to the high risk of malaria across the country combined with declining immunisation coverage against preventable childhood diseases.^[4] Mozambique remains among the top five countries contributing to the global malaria burden.^[3] Mozambique is also one of the countries aiming to accelerate progress against the disease under the High Burden to High Impact initiative.

The National Malaria Control Programme's (NMCP) National Malaria Strategic Plan for 2017–2022 focused on burden reduction in highly endemic areas, with a mid-term review recommending SMC as a malaria control strategy to accelerate impact in the highest burden locations.^[5] The updated National Strategic Plan 2023–2030 recommends the continuation and scale-up of SMC for malaria control, to reach the country's goal of ensuring that 85 percent of the target population benefit from at least one timely prevention strategy (vector control, chemoprevention and/or vaccine) by 2030.^[6]

Malaria transmission varies across the country and can be highly seasonal in some areas, with the peak in malaria cases generally occurring roughly 6–10 weeks after the onset of precipitation. The warmest, wettest months typically fall between November/December and February, with the subsequent peak in malaria prevalence occurring between January and March/April.^[7,8]



Community distributors provide a caregiver with SMC medication for her child in Nampula province, Mozambique

From research to scale

Between 2020 and 2022, Malaria Consortium and the NMCP conducted a hybrid implementation study in four districts of Nampula province — selected for its high burden of malaria cases and seasonal malaria transmission — in response to the inclusion of SMC in the country's National Malaria Strategic Plan. SMC administration involved four courses of sulfadoxine–pyrimethamine (SP) and amodiaquine (AQ), known as SPAQ, given in 28-day cycles during each annual high transmission season. In total, 120,000 children under five were reached with SMC during this period. Despite the high levels of resistance to SP observed, the study concluded that SMC in Nampula province was feasible, acceptable and effective in preventing malaria cases in children under five during the high transmission season.^[9] Following the successful completion of the study, Mozambique's Ministry of Health decided to expand SMC to all 23 districts of Nampula province in 2023, reaching around 1.3 million children.

Tailoring SMC to the local context (2020)

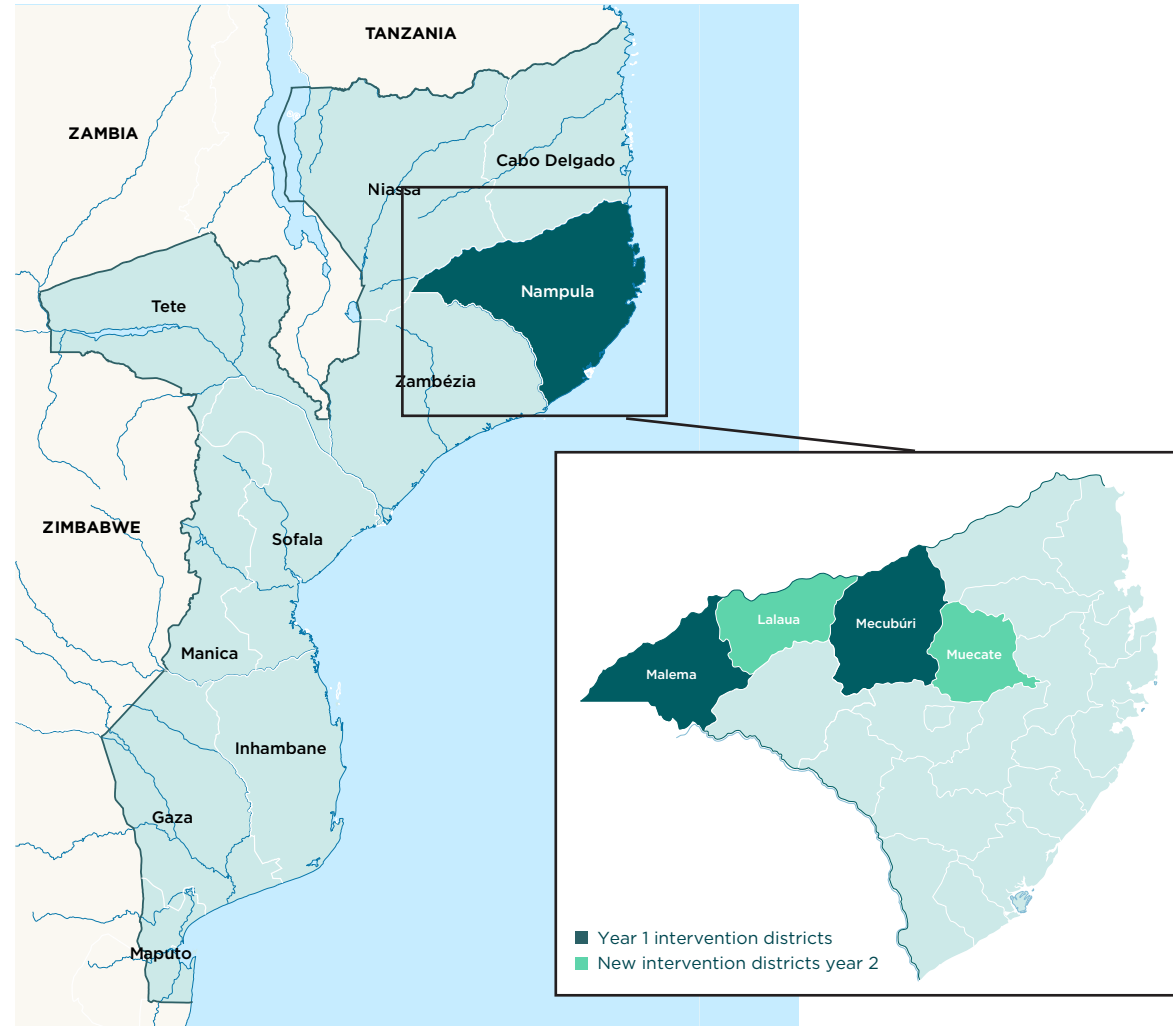
The introduction of SMC in Mozambique required several adaptations to pre-existing protocols and tools used in Sahelian countries, building on learning from those countries and tailoring the intervention to the context of Nampula province:

- **Language and training adjustments:** SMC training materials, forms and tools were translated from English to Portuguese to ensure accessibility for local health workers and community members.
- **COVID-19 compliance:** The introduction of SMC to Mozambique coincided with the start of the COVID-19 pandemic. In-person meetings and training sessions were adapted to align with national COVID-19 prevention

guidelines, allowing safe continuation of SMC activities.^[10]

- **Community-centred management of rumours and misinformation:** A dedicated community leader was appointed in each community to manage negative rumours relating to the campaign, enhancing trust and dispelling misinformation about SMC.
- **Enhanced monitoring and data collection:** Daily monitoring of implementation activities was introduced, involving analysis of administrative data, so that approaches could be adjusted in real time as needed.
- **Data digitisation:** An electronic database was developed to enable daily data entry, improving the efficiency of data management and reporting.
- **Modified supervision model:** Supervisors used motorbikes to meet community distributors within their communities, delivering guidance and distributing medicines directly to them, instead of requiring community distributors to travel to a fixed meeting point.
- **Localised engagement strategy:** Community engagement shifted from traditional methods (e.g. using megaphones) to a door-to-door approach, led by a 'guide leader' in each community. This approach fostered personal interactions and more direct communication.

Establishing and refining SMC implementation (2021-2022)



The first year of SMC implementation in Mozambique served as a pilot to establish the SMC delivery model in Nampula, train community distributors and build community awareness of SMC, setting the groundwork for potential expansion.

In the second year, the SMC delivery model was refined based on lessons from the previous year, improving distribution efficiency and building community trust to support a larger scale rollout. This included improvements in community health infrastructure and logistical planning. SMC activities were synchronised with local health facility operations to ensure better coverage and accessibility. Intensive community engagement continued, including formative assessments to gauge community knowledge, attitudes and practices. Real-time monitoring helped identify and address operational challenges promptly. Results were encouraging, with high coverage of households and eligible children in the study areas, comparable to SMC coverage typically seen in West African settings, where SMC has been delivered for several years.^[11]



Community distributor prepares SMC medication for administration

Adapting to scale (2023)

In preparation for the expansion of SMC delivery across Nampula province, Mozambique arranged a knowledge exchange with Nigeria, which has more than a decade of experience in implementing large-scale SMC campaigns. This exchange was captured in a learning brief^[12] Nigeria has the most children reached with SMC, and the intervention has been integrated into the national malaria strategy. Malaria Consortium has an established relationship with the Nigerian National Malaria Elimination Programme (NMEP), which leads SMC implementation in the country. The aim of the visit was to learn about the successes and challenges of Nigeria's SMC programme and adapt these lessons to the Mozambique context. In addition, the team sought to understand how Nigeria has integrated SMC into the national health system to achieve sustainable efficiencies at scale.

After the learning exchange with Nigeria, the following changes were made to enhance the planned scale-up of SMC in Nampula province:

- **Provincial SMC technical group:** A dedicated provincial technical group was established to provide targeted advice and coordinate SMC activities, supporting smoother implementation across the region.
- **Memorandum of understanding:** Mozambique's Ministry of Health and Malaria Consortium developed a formal agreement that clearly outlined roles and responsibilities, to streamline operational support and clarify expectations.
- **Focused staff roles:** The roles of Malaria Consortium staff were adjusted to prioritise logistical and financial management, allowing more efficient use of resources. Responsibility for direct field support shifted to the district health authorities.
- **Optimised distribution days:** SPAQ distribution was rescheduled to start on Thursdays and end on Sundays, maximising the likelihood of caregivers being home to ensure children received their doses.
- **Enhanced visibility for implementers:** Community distributors were provided with waistcoats instead of T-shirts, to improve their visibility and allow them easier access to households.

- **Remote support for security-affected districts:** For areas with security risks, Malaria Consortium provided remote logistical support, while the NMCP managed in-field operations.
- **Daily remote implementation reviews:** The NMCP led daily remote meetings with district and provincial representatives, to review progress and address issues promptly.
- **Introduction of regular end-of-cycle surveys:** Targeted end-of-cycle surveys were conducted to assess programme performance and identify areas for improvement to strengthen delivery in subsequent cycles. At the end of each cycle, the results are discussed and an action plan is developed for each health area to inform improvements in the next cycle.

Caregivers administer SMC medication to their child, Nampula province, Mozambique



Reflections on delivering SMC at scale

At the end of the first SMC campaign delivered at scale — reaching 1.3 million children across all 23 districts of Nampula province — Malaria Consortium captured some key lessons to inform the potential future expansion of the SMC programme to other parts of the country.

To document lessons, guidance was reviewed — including the WHO's Field Manual for SMC and Malaria Consortium's quality standards framework for SMC — and compared with descriptive reports from each phase.^[13] This provided a baseline for evaluating actual practices against established guidelines. The learning process also involved reviews of regular meetings that took place throughout the campaigns, as well as reflection sessions at district and provincial levels with all SMC stakeholders. These included community distributors, supervisors, district health facility representatives, community leaders and government officials. Together, these methods enabled a comprehensive review of implementation strategies, highlighting successes and challenges, and informing improvements for future SMC rounds.

The learning process resulted in the identification of nine key categories of learning:

1. Planning and enumeration

- **Campaign planning:** Starting campaign planning at the district level allowed for tailored decision-making that reflected specific local needs, leading to more accurate resource allocation and effective logistical coordination.
- **Target population estimation:** Combining different data sources, such as census data and historical records from similar campaigns, provided a more accurate target population estimate, reducing the risk of under- or over-quantifying resources. However, discrepancies in projections based on census data presented challenges, as they often underestimate the population, requiring ongoing adjustments.
- **Risk management:** Applying a risk management framework helped identify and mitigate internal and external risks, such as overlapping health campaigns, which could have otherwise disrupted SMC delivery.

2. Procurement and supply management

- **Integration of SPAQ distribution into health systems:** Embedding SPAQ distribution within the existing health system's supply chain lowered implementation costs and ensured the timely availability of resources at health facilities. However, some bureaucratic delays in medicine importation posed a threat to the timely start of the SMC round.
- **Stock management:** Coordination with other SMC-implementing countries proved vital in managing stock-outs through shared resources. For example, during the 2022/23 round, when the SMC programme in Mozambique had a stock-out of SPAQ for children aged 3–11 months, Nigeria gave prompt support to continue the remaining cycles. Detailed training on age-based SPAQ dosage calculations helped minimise distribution errors; however, incorrect dosing by some implementers led to stock shortages, emphasising the need for training on how to determine the child's age so the correct dosage is given.

3. Community engagement

- **Data-driven engagement strategies:** Incorporating results from formative assessments allowed the community engagement strategy to be tailored to specific local attitudes and concerns, resulting in high community acceptance. This approach provided a foundation for sustainable engagement and built stronger relationships with local leaders.

“We are happy with this campaign. Since our daughter started taking this medicine in 2022–2023, she has not been infected with malaria. She is protected, and we highly recommend that other families adhere to this strategy, and they will not regret it.”

Caregiver, Ilha de Moçambique, Nampula province

- **Use of guide leaders for door-to-door engagement activities:** Assigning local leaders to accompany community

Community distributor, Nampula province, Mozambique



distributors during door-to-door delivery fostered trust and improved access, especially in areas with cultural or political sensitivities. However, inconsistent selection criteria meant that some guide leaders were not physically able to participate in door-to-door distribution, leading to lower motivation and performance in some cases.

4. Training and capacity strengthening

- **Cascade training model:** The cascade training model — in which trainers were trained to pass knowledge down the chain of implementers — effectively prepared over 14,000 implementers for SMC distribution, maintaining good coverage despite staff turnover. However, selecting trainers solely based on post-training-of-trainers test scores limited training quality in some areas, as practical knowledge test scores were not adequately considered.
- **Implementer selection criteria:** Applying clear criteria was essential for ensuring training quality, as deviations from criteria led to the selection of unqualified implementers in some cases, impacting training outcomes and field readiness.

5. Administration of SMC medicines

- **Door-to-door delivery model:** The door-to-door model improved access and acceptability of SPAQ among target households, significantly enhancing coverage. However, delays in paying implementers reduced motivation and commitment, affecting coverage in certain districts.
- **Continuous refresher training:** Ongoing refresher training on child eligibility and age helped reduce distribution errors, ensuring that children received the appropriate dosage. High staff turnover necessitated frequent retraining, adding complexity to programme continuity.

“I’m a community SMC distributor in the Jembesse community on the Ilha de Moçambique. Because I’m a mother, before I go to work, I wake up at 4am and prepare the house and food for the children, then I go to the health facility at 7am. I arrive at 7.30am for the day’s planning meeting and I then start work at 8.30am. During the day, I administer SPAQ to around 65 children.

Sometimes, we visit more houses and continue until we reach the daily target. When we find sick children, we refer them to the nearest health facility and if they’ve already gone, we encourage the caregivers to continue medicating them.

As a woman, I’m proud to be doing this work, especially as it’s unusual to find women doing this kind of work. I’m pleased mainly because I know I’m inspiring other women in my community.”

Woman community distributor, Jembesse Community, Ilha de Moçambique

6. Referral and pharmacovigilance

- **Referral systems:** Referral by community distributors of children they identified with fever during SMC distribution ensured follow-up through qualified healthcare providers. However, instances of inaccurate and delayed referrals occurred where community distributors were unable to identify fever symptoms due to gaps in their training.
- **Adverse event reporting:** The process for reporting adverse events was streamlined, allowing efficient data collection and follow-up. Communication with caregivers on adverse events helped maintain community trust, although some distributors required additional training to recognise symptoms consistently.

7. Supervision

- **Multi-level supervision:** Assigning supervisors across national, provincial, district and community levels allowed for comprehensive oversight, helping to ensure high quality and coverage. High motorbike rental costs for supervisors presented a financial challenge, and staff turnover affected consistency and experience in supervisory roles.
- **Movement of supervisors:** Using motorbikes allowed supervisors to meet community distributors in their communities, saving time and increasing efficiency. However, road conditions in some areas hindered travel, impacting the supervisors’ ability to provide consistent oversight.

“The key to getting good results from the SMC campaign is engagement at all levels: the District SMC Supervisor, the SMC coordinators in the health facility, the community supervisors and distributors as well as the community leaders. Good coordination between all these actors and the results will be as planned.”

District SMC Supervisor, Ilha de Moçambique

8. Monitoring and evaluation

- **Daily debriefings and remote meetings:** Conducting daily debriefings allowed teams to identify gaps and adjust strategies immediately, which improved campaign implementation over time. However, limited time for compiling and analysing data resulted in issues relating to quality that occasionally affected timely decision-making.
- **End-of-cycle surveys:** End-of-cycle surveys helped guide strategic adjustments, improving performance in subsequent cycles. Delays in coordinating monitoring activities between technical and operational teams highlighted the need for improved planning to meet deadlines.

9. Payments to implementers

- **Standard operating procedures (SOPs) for payment:** Implementing clear SOPs improved transparency and efficiency in payments, leading to greater satisfaction and motivation among implementers. Implementers’ mobile accounts were verified in advance to minimise delays; however, the lack of biometric verification complicated identity confirmation, requiring added coordination and time.
- **Mobile account validation:** Validating mobile accounts during training ensured accurate payment processing, enhancing implementer motivation. Challenges arose for those implementers without personal mobile accounts, complicating the payment process and impacting satisfaction.



Seasonal malaria chemoprevention delivery in Malema, Nampula province, Mozambique

Recommendations

Planning and enumeration

Building on the success of **district-based microplanning**, it is recommended to refine and repeat this approach in future campaigns to ensure resource needs are accurately met.

To address challenges with population underestimation, **continue to incorporate multiple data sources** (census and historical campaign data) to estimate target populations and reduce the risk of resource shortages. Digitalising databases and refining these across multiple health campaigns will result in more accurate target population estimates.

Create a comprehensive risk management plan in advance to address overlapping campaigns and other potential disruptions, minimising campaign delays.

Procurement and supply management

Strengthen coordination on stock management. Train implementers thoroughly on age-based dosages to prevent stock-outs.

Further **integrate SMC supply chains within the Ministry of Health's distribution network** to streamline logistics, as demonstrated successfully in this campaign.

Community engagement

Continue to **incorporate formative assessments into the engagement strategy** to address community-specific concerns. This approach can enhance acceptance and counteract misinformation.

Standardise criteria for guide leader selection to ensure leaders meet physical and technical requirements. Aligning leader capabilities with campaign needs will enhance community acceptability and participation outcomes.

Training and capacity building

In addition to post-training-of-trainers test scores, **expand trainer selection criteria** to consider practical knowledge, skills and the ability to communicate effectively. This approach can address previous gaps in training quality.

Refine the cascade training approach by continuing to monitor its quality and equip the trainers with all materials and knowledge to deliver relevant content thoroughly.

Administration of SMC medicines

Given its success in improving access, **maintain the door-to-door delivery model** to ensure high reach and acceptability. Streamlining payment processes to ensure timely payment will maintain implementer commitment.

Reinforce training on child eligibility and age assessment to prevent dosage errors and maintain standard distribution procedures.

Referral and pharmacovigilance

Implementers should receive **enhanced training in identifying symptoms** such as fever to improve the accuracy of referrals and ensure better patient outcomes.

To sustain caregiver trust, **strengthen adverse event surveillance and reporting** ensuring timely communication with caregivers about potential side-effects.

Supervision

Ensure adequate supervisor resources. To address cost challenges, explore cost-sharing options or local partnerships for motorbike rentals.

Where road conditions allow, continue to use motorbikes to maintain high supervision standards and distribution team support.

Monitoring and evaluation

Continue daily debriefings with an emphasis on data quality checks. Continue to **conduct end-of-cycle surveys**, scheduling these well in advance to ensure timely insights that can be used to inform the implementation of subsequent rounds.

Improve coordination between teams. Addressing gaps in coordination between technical and operational teams will help to keep monitoring activities on schedule, supporting more responsive implementation adjustments.

Payment of implementers

Refine payment SOPs for the local context, reducing barriers to payment by removing unnecessary document requirements, which will prevent delays and enhance motivation.

During training, carry out **early validation of implementers' mobile accounts** to ensure timely and accurate payments, address common payment issues and increase implementer satisfaction.



Caregiver and infant, Nampula province, Mozambique

Looking ahead

This initial scale-up of SMC in Mozambique creates a foundation for the further expansion of SMC within the country, and in other geographies with similar contexts. The success of this scale-up has led to the inclusion of SMC in Mozambique's updated Malaria Strategic Plan for 2023–2030. In recent years, other new geographies where the use of SMC has been explored include Côte d'Ivoire, Kenya, South Sudan and Uganda. The lessons and recommendations outlined in this paper can support future scale-up in these geographies.

The digitalisation of SMC campaigns in Mozambique has been identified as an area for further development and forms part of the NMCP's wider vision for integrated health campaign digitalisation. In 2024, Malaria Consortium partnered with the Mozambique National Malaria Control Programme and eGov Foundation to trial a digital tool for SMC distribution management based on eGov's DIGIT Health Care Management (HCM) platform.^[14] DIGIT HCM, known in Mozambique as Salama, was first developed to manage mosquito net distribution campaigns in 2022. The SMC component of the platform was rolled out during the 2024 SMC round, with community distributors and supervisors trained to use the application to record house visits, quantify medicine stocks, and monitor attendance and other data points. This allows local leaders to monitor campaigns and make operational decisions based on real-time data.

SMC remains a key tool for malaria prevention and control, alongside other interventions including mosquito nets, indoor residual spraying and malaria vaccines, in addition to timely diagnosis and treatment. The success of scale-up in Mozambique underlines the utility of SMC as a tool outside of the Sahel and supports the case for further scale-up of SMC in areas with similar epidemiological profiles.

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