

# Seasonal Malaria Chemoprevention in Guinea

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## Executive Summary

In Guinea, children under the age of five face an overall mortality rate of 89 per 1,000 — 28 per cent of those deaths are caused by malaria. The primary method of reducing malaria transmission involves vector control, including the use of insecticide-treated mosquito nets (ITN) and indoor residual spraying. Because malaria is spread through the bite of infected female mosquitoes, the risk of acquiring malaria significantly increases during the rainy season (July to October), when rainfall results in more standing water and a better environment for mosquitoes to breed.

In 2012, the World Health Organization updated their recommendations and added seasonal malaria chemoprevention (SMC) to its basket of interventions to prevent and treat malaria for children under the age of five. In 2015, an SMC program was introduced in Guinea's most affected regions. The program allows for a combination of two drugs to be administered monthly to every child under five living in targeted prefectures, for the four months when malaria transmission is at its highest. The program is free for all eligible recipients.

The annual campaign to administer SMC to children under the age of five has achieved a mean 71.6 per cent coverage rate for the highly dispersed population. While the program has yet to achieve total coverage, it is considered a success. Four main factors have contributed to that success.

The first factor is hyperlocal delivery. The program prioritized logistics and communications at a house-by-house level to adapt the distribution strategy to the unique needs of each community. The next factor is multilevel engagement and coordination. Each stakeholder's strengths and responsibilities were coordinated with the program's needs. The third factor that contributed to the program's success was integrating monitoring and evaluation. The timely use of data allowed the program to respond to issues as they arose. The last factor was the management of the global supply chain of the SMC pharmaceuticals and a coalition to gain support from manufacturers.

## Malaria in the Guinean Context

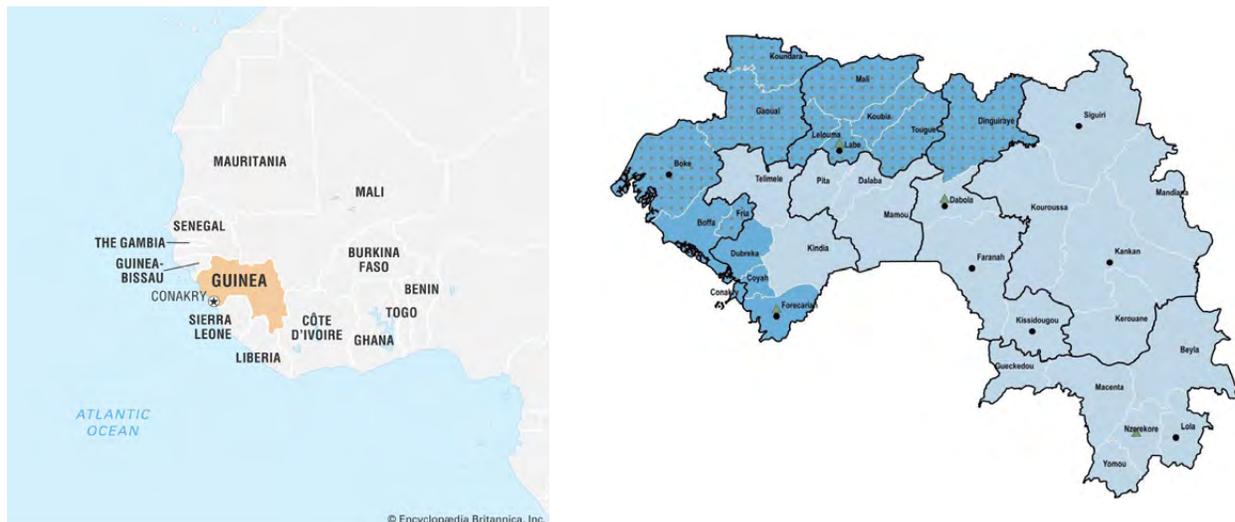
The Republic of Guinea is hard to reach by many measures. More than half of the population (55 per cent) lives below the domestic poverty line, and the country ranks near or at the bottom globally on measures of road quality and infrastructure, per capita income and access to health services. Children born in the poorest economic quintiles in Guinea face some of the highest mortality rates in the world. Health outcomes for children in rural areas similarly lag those of their city-dwelling peers.

In Guinea, malaria is responsible for 28 per cent of all deaths among children under the age of five — a cohort already facing an overall mortality rate of 89 per 1,000. Malaria is an acute febrile illness caused by *Plasmodium* parasites spread through the bites of infected female mosquitoes. Symptoms usually appear 10 to 15 days after the infective bite and can progress to severe illness if not treated within 24 hours of fever onset. While

partial immunity to malaria is acquired during childhood, young children who have not yet acquired such immunity are at elevated risk of severe complications. Thus, the burden of malaria falls especially hard on young children.

Children with severe and recurrent malaria frequently develop severe anemia, respiratory distress or cerebral damage. Vector control is the primary method of reducing malaria transmission, including through the use of insecticide-treated mosquito nets (ITN) and indoor residual spraying.<sup>1</sup>

There are significant variations in malaria prevalence in the country, ranging from 66 per cent in Faranah in central Guinea to 3 per cent in Conakry on the coast. Along with much of the Sahel region of Africa, Guinea's northern prefectures experience highly seasonal malaria transmission. The risk of acquiring malaria significantly increases during the rainy season each year (July to October) — rainfall leads to standing water and therefore more breeding mosquitoes.



**Figure 1.** Maps of Guinea (left) and its prefectures (right); prefectures supported by the US President's Malaria Initiative (PMI) for seasonal malaria chemoprevention are highlighted in darker blue. (Sources: *Encyclopaedia Britannica*, March 2021. [US President's Malaria Initiative, "Guinea: Operational" \[Washington, DC: USAID, 2019\]](#)).

1 David Collins, "The Cost and Impact of ACCESS-SMC," *Management Sciences for Health*, June 9, 2016. [Link](#)

## Demographics

Guinea is a French-speaking country with a population of 12.7 million people. Despite strong mineral and agricultural resources, it remains one of the poorest nations in West Africa with 35 per cent of the population living below the poverty line as of 2018.<sup>2</sup> The country also ranks among one of the lowest on indicators for health and development in the world, at 178 out of 189 countries according to the 2020 Human Development Index.<sup>3</sup>

Demographics can significantly affect public health coverage rates. Communities in urban environments, for example, received 32 per cent higher measles vaccination coverage than in rural areas. Public health program coverage is also related to income levels — coverage is highest among the richest quintile and lowest among the poorest. According to interviewees, the small communities of rural areas were easier to mobilize to support the seasonal malaria chemoprevention (SMC) program's implementation. However, in agricultural areas, children often needed to work during the labour-intensive periods (which coincided with the rainy season) and therefore were not at home to receive antimalarial medications.<sup>4</sup>

## Health Care

Guinea's public health system has a pyramidal organization overseen by the Ministry of Health and Public Hygiene. The system has three administrative levels: central national, intermediary and periphery. Each geographical region has its own reference hospital, and a directorate that reports to the national Ministry of Health. The periphery is represented by 38 health prefectures, each functioning as a

decentralized entity of the healthcare system. At the most granular level, community medical centres and health posts are spread out throughout the country, constituting 96 per cent of all health structures in the interior.

In 2011, just 6 per cent of Guinea's gross domestic product was allocated toward health. The country's health infrastructure relies heavily on foreign aid. Basic services and facilities are limited in both urban and rural settings, with just over half the population having access to public healthcare services.<sup>5</sup>

In this low-resource environment, the diversity of geography, language and population density adds to the challenges of SMC program delivery. To protect children from malaria, a broad national strategy needed to be paired with customization at the community level to successfully distribute SMC medications to children across different areas. The country also needed a complex web of stakeholders to supplement existing healthcare capacity both financially and logistically.

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## Seasonal Malaria Chemoprevention: Program Overview

In 2012, the World Health Organization (WHO) updated their recommendations and added seasonal malaria chemoprevention (SMC) to its basket of interventions to prevent and treat malaria in the Sahel for children under the age of five.<sup>6</sup> SMC is a proven intervention to reduce the burden of malaria. Overwhelming evidence shows that SMC is effective in reducing the incidence of malaria among this age group

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2 "Human Development Report 2020: Guinea," United Nations Development Programme 2020. [↗](#)

3 "Latest Human Development Index Ranking," United Nations Development Programme 2020. [↗](#)

4 National Malaria Control Program, "2018 Annual Report — Seasonal Malaria Chemoprevention Drug Distribution Campaign" (Conakry: Republic of Guinea Ministry of Health, 2018).

5 US President's Malaria Initiative, "Malaria Operational Plan FY 2018" (Washington, DC: USAID, 2018).

6 "WHO Policy Recommendation: Seasonal Malaria Chemoprevention (SMC) for Plasmodium Falciparum Malaria Control in Highly Seasonal Transmission Areas of the Sahel Sub-region in Africa," World Health Organization, March 2012. [↗](#)

of children in areas of highly seasonal malaria transmission.

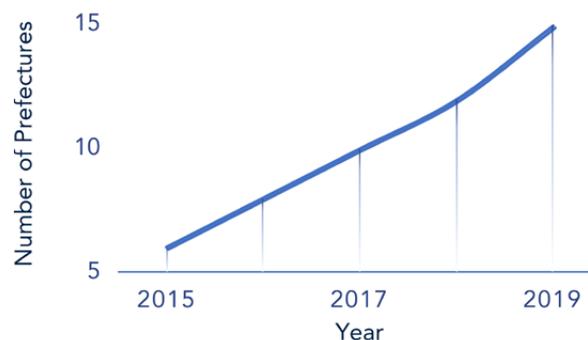
A trial in Mali found that SMC reduced the prevalence of malaria by 80 per cent against the control, and that the benefits were still pronounced even among households already using insecticide-treated mosquito nets (ITNs). These findings are in line with other trials' results. A meta-analysis of 12 studies found that SMC reduces the incidence of uncomplicated malaria by 83 per cent during the high-transmission season.<sup>7</sup> The reduction in incidence is similar to the impact on malaria when children routinely sleep under insecticide-treated bednets.

SMC was introduced in Guinea in 2015 and incorporated into the malaria-prevention strategies that the National Malaria Control Program (NMCP) employed in the northern prefectures, which are among the poorest and most sparsely populated regions in the country. The program involves the monthly administration of a combination of two drugs, sulfadoxine-pyrimethamine and amodiaquine (SP+AQ), to every child under five living in a targeted prefecture, for the four months in which malaria transmission is at its highest. Each prophylactic treatment is effective in preventing 90 per cent of malaria cases for 28 days, after which its effectiveness begins to decline. Monthly treatment cycles of SP+AQ beginning at the onset of the high-transmission season have been highly effective in preventing malaria, especially when combined with other prevention strategies. The program is free of charge for its recipients.<sup>8</sup>

## Scale-Up

SMC started in 2015 in six prefectures, with a steady annual increase in coverage until 15 districts were covered in 2019. The 2018

campaign aimed to reach 95 per cent of the 826,000 children residing in those 13 prefectures. Districts are considered for inclusion based on criteria of rainfall and temperature patterns, as well as the seasonality of reported malaria cases.<sup>9</sup>



**Figure 2.** SMC program growth in Guinea, by prefecture

The rapid expansion of SMC in Guinea was part of a multicountry project called ACCESS-SMC that helped countries incorporate SMC into their national malaria-control programs. The program, funded by Unitaid and led by the Malaria Consortium and Catholic Relief Services, was designed to increase access to SMC and support the national malaria-control programs in seven countries including Burkina Faso, Chad, Guinea, Mali, Niger, Nigeria and The Gambia.

In 2018, the President's Malaria Initiative (PMI) funded implementation in eight prefectures through its local partner StopPalu+ while the Global Fund to Fight AIDS, Tuberculosis and Malaria supported implementation in five prefectures through Catholic Relief Services.

## Beneficiary Identification

In line with WHO guidance, the SMC program's intended beneficiaries are children between three and 59 months of age who do not have allergies to the medication or symptoms of

7 Anne L. Wilson, "A Systematic Review and Meta-analysis of the Efficacy and Safety of Intermittent Preventative Treatment of Malaria in Children (IPTc)" (London: IPTc Taskforce, 2011).

8 Kovana Marcel Loua and Paul Milligan, "Seasonal Malaria Chemoprevention Coverage Survey Guinea, 2018," Project Report (London School of Hygiene and Tropical Medicine, 2019). [↗](#)

9 US President's Malaria Initiative, "Abbreviated Malaria Operational Plan FY 2019" (Washington, DC: USAID, 2019).

malaria at the time of the first dose's administration and who reside in eligible prefectures. While malaria is endemic across the country, only those prefectures in the north experience the highly seasonal transmission of malaria that lends itself to SMC as a preventative measure. Locating children for enrolment to receive SMC — even identifying eligible beneficiaries, particularly in rural or remote communities where links to community health centres are less established — has been a challenge.<sup>10</sup>



**Figure 3:** Administration of the first dose of seasonal malaria chemoprevention medication in the Koundara prefecture, Boké region (Photo: ACCESS-SMC)

## Delivery

Every month from July to October, community health workers (CHWs) travel door to door to administer the medication. Each round of distribution takes four or five days. CHWs administer a combined dose of sulfadoxine-pyrimethamine and amodiaquine directly, and leave an additional two tablets of amodiaquine for the caregiver to administer on each of the following two days. Supervisors follow up in distribution areas to verify coverage, identify

weaknesses in the administration of medication and fill out tracking forms.

Overall, the cost of providing SMC for children under five is relatively low compared to other internationally supported health interventions, at approximately USD 5.12 per child per year, or USD 1.28 per treatment cycle. The cost of SMC drugs for the children represents 24 per cent of the overall cost, with the remaining costs taken up by delivery.

## Evidence

In 2018, the London School of Hygiene and Tropical Medicine (LSHTM) conducted a survey in Guinea of households in the 13 districts receiving SMC to determine whether the program was reaching its intended beneficiaries.<sup>11</sup> It found that its reach to eligible children was generally quite high. Overall, the mean coverage rate across cycles was 71.6 per cent of all children across the 13 districts, with 79.3 per cent having received at least one treatment cycle and 60.7 per cent having received all four. The mean number of treatment cycles received was 2.9. This number was brought down by poor performance in the populous Siguiré prefecture, where 40 per cent of eligible children or fewer received SP+AQ in each of the four treatment cycles. Across the other prefectures, the proportion of eligible children who were reached was much greater, with mean coverage rates ranging from 81.5 to 96.3 per cent, with most ranging from the mid-to-high 80s to low 90s.

The reach of Guinea's SMC program was also highly equitable. Those in the lowest quintile were slightly more likely than those in the highest quintile (mean number of treatment cycles at 3.2 versus 2.4) to receive SMC. There were no observable differences in access by gender. Widespread access to SMC is particularly important in light of the relatively low rate of ITN usage. Despite ITNs being free for anyone

10 National Malaria Control Program, "2018 Annual Report."

11 Loua and Milligan, "Seasonal Malaria Chemoprevention Coverage Survey, Guinea."

in Guinea, only 43.6 per cent of the children three to 59 months slept under a bed net. SMC complements existing malaria prevention-and-treatment strategies, while affording robust and urgently needed coverage to those without access to ITNs.

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## Factors of Success

In our research we found that Guinea’s relative success at reaching children for seasonal malaria chemoprevention (SMC) relies on four key aspects of the program: hyperlocal delivery, multilevel engagement, integrated monitoring and evaluation and global supply chain management.

### Hyperlocal Delivery

Organizing logistics at the most granular level of the existing health infrastructure is crucial. For example, SMC was centred on distribution at each health centre by community health workers (CHWs). The varying geographic and ethno-cultural context between districts required local changes in strategy and CHWs have a strong influence on the success of last-mile delivery. It is conceivable that the door-to-door delivery strategy would not have worked without these key adaptations. As the National Malaria Control Program (NMCP) outlined in its 2018 annual report, the program needed to get the details right to provide structured internal communication at the health-centre level.<sup>12</sup> These details included displaying team routes, providing radios and protection kits, providing cellphone credits for data transmission and daily summary meetings.



**Figure 4.** Community health workers training in Wendou Mboure village, Koundara prefecture, Boké region (Photo: ACCESS-SMC)

### COMMUNITY HEALTH WORKERS

The CHWs act as intermediaries between communities and health centres. They monitor local health issues and coordinate with clinical officers. Health workers are part-time volunteers who receive one to three weeks of initial training.<sup>13</sup> Recently, various organizations have employed CHWs to implement specific health programs such as malaria prevention, Ebola outbreak control and maternal and child health.<sup>14</sup>

In 2018, 4,746 community health workers provided SMC delivery, each based at one of 55 participating health centres. Health workers received training on malaria-specific activities, including infection control and rapid diagnostic test usage. They get retrained every two years on malaria case management, including how and when to refer severe cases to health centres. Some health workers have expressed dissatisfaction with the length of time between training periods, categorizing it as a challenge to effective service delivery.

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12 NMCP, “2018 Annual Report — Seasonal Malaria Chemoprevention Drug Distribution Campaign.”

13 International Development Association, “Project Appraisal Document on a Proposed Credit and Grant to the Republic of Guinea” (Washington, DC: World Bank, 2015).

14 UNICEF Health Section, Program Division, “Community Health Workers During the Ebola Outbreak in Guinea” (New York: UNICEF, 2017).

Other nongovernmental organizations have noted difficulty in maintaining accountability because they lack a regular salary. This can be a challenge at the delivery level — some workers prioritize other commitments over their health work. At the policy level, there is concern that CHW interventions are unsustainable unless CHWs receive financial incentive and a higher level of integration into the national health system.

### DELIVERING TO THE LAST MILE

The Ministry of Health has estimated that only 55 per cent of the population has access to public healthcare services, making it even more extraordinary that SMC mean coverage reached 71.6 per cent of eligible children within target districts in 2018. The door-to-door delivery approach promoted better coverage with a negligible cost increase compared to the fixed-point model (where families would bring eligible children to a central place).<sup>15</sup>

The physical form of the medicine also influenced the efficacy of the delivery process. Before 2016, the tablets were nondispersible: health workers had to manually crush each tablet and add it to water and add sugar to mask the bitter taste. This process took at least five minutes per child and often had to be repeated because children would occasionally spit out the mixture. ACCESS-SMC worked with manufacturers to develop a child-friendly tablet that took less than 30 seconds to administer and required only a small quantity of water to dissolve. The creation of this tablet enabled CHWs to treat more children in the same period of time, and reduced the number of tablets that were wasted when children rejected the mixture.

### GEOGRAPHICAL CHALLENGES

SMC delivery has been hindered by geography. Remote and hard-to-reach areas are difficult to

access. Floods sometimes block roads and CHWs can travel to districts up to 20 kilometres away, typically on foot or by bicycle on underdeveloped roads.<sup>16</sup> The travel stipend for CHWs does not relate to the distance travelled by each health worker. With each worker reaching an average of 470 children in 2017, and covering up to 15 villages, the stipend often does not fully cover the cost of travel.<sup>17</sup> Such costs are a financial disincentive to seek out the most remote locations since CHWs' travel expenses come out of pocket. The program is working to decrease the individual distribution workload: in 2018 the average two-person team covered only 150 children despite the program having scaled up to three additional districts.

### Multilevel Engagement

The SMC program has to juggle the demands of stakeholders at different levels of health care and government, as well as multiple external partners. The implementation's success depends on its ability to weave together key contributions from different actors. For example, the 2018 campaign highlighted community endorsement and the involvement of religious leaders and public criers who acted as social mobilizers and local communicators. Another strength was the technical, logistical and financial support received from external partners.

In addition to stakeholder needs, the scope of responsibilities also varies and overlaps between the big-picture targets at the national level and the decisions each health centre makes. In general, authorities across all levels successfully adhere to the campaign goals. However, in certain circumstances collaboration remained a challenge because of the limited involvement of certain partners such as the WHO and UNICEF.

15 Dalberg Global Development Advisors, "Unitaid Project Evaluation: Achieving Catalytic Expansion of Seasonal Malaria Chemoprevention in the Sahel (ACCESS-SMC), November 2016–April 2017." [↗](#)

16 Nathan P. Miller, Penelope Milsom, Ginger Johnson et al., "Community Health Workers During the Ebola Outbreak in Guinea, Liberia, and Sierra Leone," *Journal of Global Health* 8 (2). [↗](#)

17 "Community Health Workers During the Ebola Outbreak in Guinea," UNICEF Health Section, Program Division (New York: United Nations Children's Fund (UNICEF), 2017).

## COMMUNITY SENSITIZATION

Awareness of SMC, and of the dates on which the treatment would be administered, was remarkably high across all eligible prefectures. In 2018, a London School of Hygiene and Tropical Medicine (LSHTM) household survey found that 94.7 per cent of eligible households were aware of the SMC campaign and 92.4 per cent knew the date of the campaign's fourth cycle in advance. However, in line with reduced reach reported elsewhere in Siguiri, awareness of the distribution date there was comparatively lower, at 76.4 per cent of eligible households.

To create awareness prior to SMC distribution, various methods for sharing information are used across the different prefectures. This includes town criers, religious institutions (church or mosque), radio and word of mouth from health workers and supervisors. Information shared by the health workers during visits includes explaining to the caregiver how to administer the tablets over the two days, information about potential side effects as well as advice to bring their child to the health worker if they become ill after taking the drugs.

Considered a traditional means of communication, town criers travel throughout a given community sharing news, announcements and other messages. Typically shouting as they travel, criers are effective in disseminating information that can help bring awareness to health issues affecting rural and hard-to-reach areas.<sup>18</sup> Town criers support public awareness campaigns targeting caregivers about the SMC program, including its purpose and dates for distribution to help ensure caregivers are available on the days that CHWs visit. They have been highly effective in building this awareness. In 2018, 50.1 per cent of respondents to a LSHTM household survey reported having heard about the distribution dates for the

campaign through a town crier. Town criers were particularly important in Siguiri, where awareness of distribution dates was already low and where outreach through community health workers was considerably reduced. In Siguiri, 76.1 per cent of households report having learned about the distribution dates through a town crier, making them the most important source of information on distribution dates out of all the methods studied. Town criers are an important way SMC uptake is encouraged because they speak the local language and are typically well-known and trusted by community members.

On the distribution side, the Ministry of Health organized workshops in the months leading up to the distribution cycles using a cascading training approach. The workshops spread key information to health workers, communication agents and supervisors.

In 2018, micro campaign-planning workshops were carried out in each district to discuss the number of eligible children by village and district. Subsequently, macro validation workshops were organized to bring together prefecture-level coordinators and officials from the Ministry of Health, Catholic Relief Services and StopPalu+. The workshops allow officials to validate the results of the micro-planning workshops. In this way, key implementation details are shared among the different administrative levels in an efficient and scalable manner.

## STAKEHOLDERS

SMC runs with a complex and cascading network of stakeholders. Figure 5 shows some of the key organizations involved from the implementation side. They include representatives from the government and healthcare system, as well as the two external funding agencies and their implementing partners. Engagement from community leaders is also a crucial component of the process.

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18 "Communication and Social Mobilization in Yellow Fever Mass Vaccination Campaigns" (Geneva: World Health Organization, 2015)

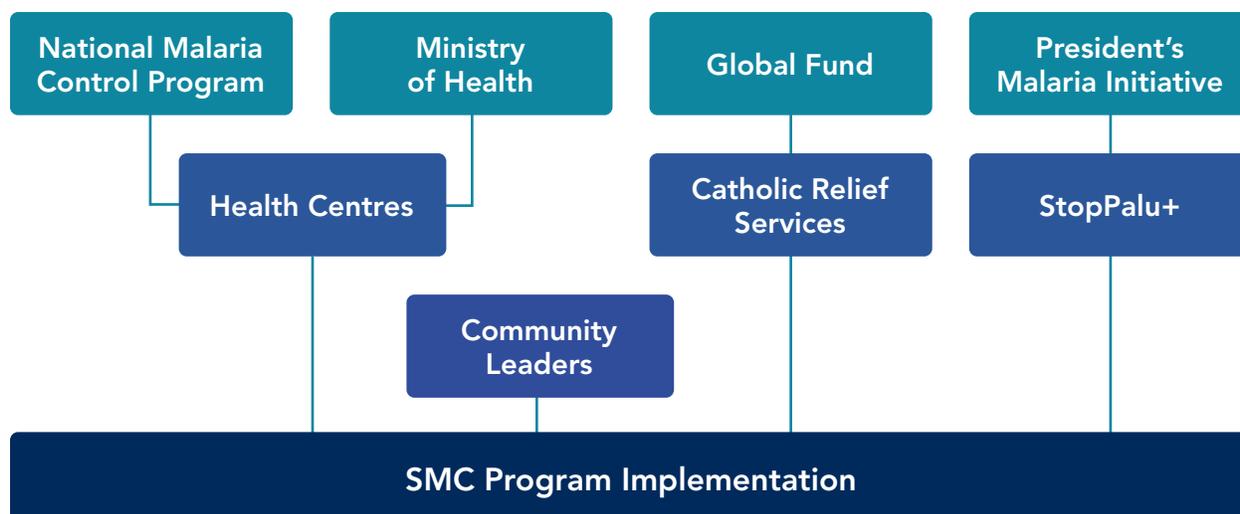


Figure 5. Organizational chart showing key implementation stakeholders in the SMC program

## Integrated Monitoring and Evaluation

Both the creation and usage of monitoring-and-evaluation data have been integrated into the SMC program to quickly improve performance. On the creation side, multiple sources of coverage data are regularly updated, each with their own strengths. During the distribution cycle, health workers operate in teams of two, with one person distributing the medicine while the other handles administrative records. In addition to medication-delivery tools, the teams are equipped with messaging and data collection tools. At the end of each day the distribution teams report back to the local supervisor of the health centre. Paper surveys and Android phones from health centres populate their data which are then migrated to the Catholic Relief Services (CRS) central records via the health districts. The country expects that the ongoing transition to digital reporting that started in the 2018 campaign will continue to improve results' traceability and accuracy.

On the usage side, the data are used to help manage the drug supply between monthly cycles and annually. The seasonal nature of SMC distribution allows for an extended period each year to review lessons learned. This means

that, in contrast to a year-round program, SMC can focus on regular improvements without the burden of maintaining continual operations.

### COVERAGE

There are two major sources of coverage data: administrative records created at the time that community health workers (CHWs) deliver sulfadoxine-pyrimethamine and amodiaquine (SP+AQ) and household surveys conducted by the University of Conakry and the LSHTM on a bi-annual basis. Administrative coverage is available for each distribution cycle and is calculated by counting the number of children who received SP+AQ from all CHWs in a prefecture and dividing it by the prefecture's estimated population. Household surveys are generally thought to be more accurate but are much more costly and cannot be used to track coverage between cycles the way administrative data can.

Mean coverage across cycles was estimated at 96 per cent in 2015 and 100 per cent in 2016 for the estimates derived from administrative records. Follow-up household surveys conducted in 2017 and 2018 estimated that the coverage rate in 2017 and 2018 was approximately 80 per cent. This apparent decline in mean coverage likely reflects the fact that administrative records overestimate coverage, as opposed to an actual

decline in coverage of the program. DHS and other general health surveys are generally not regarded as suitable sources to track SMC because of its seasonal distribution. Depending on the time elapsed since the recipients were interviewed, the resulting recall bias could affect the results.

Another potential way to track coverage is through enumerating the amount of SMC drugs consumed per health district. However, there have been challenges with data entry by some distributors that resulted in underreported consumption. Another challenge was miscommunication in the timing when drug resupplies were required and delivered. Based on improved input data during the 2018 campaign, additional indicators for district-level coverage could be added in the future.

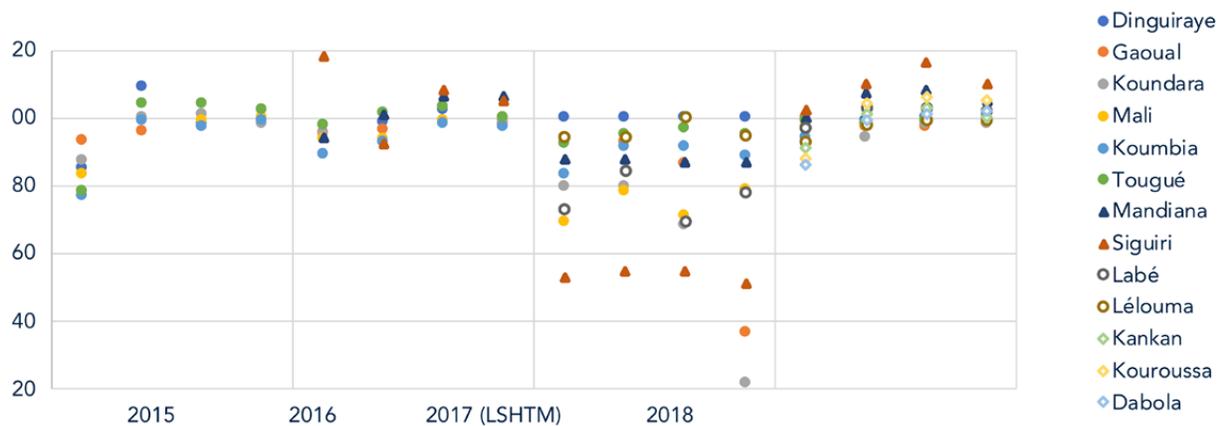
Despite these challenges, the distribution coverage target steadily increased to 95 per cent in 2018. As Figure 6 shows, district-level variance of coverage has also dropped, with many districts reporting near (or even over!) 100 per cent coverage throughout all four cycles. Because administrative coverage rates are obtained by dividing the number of treatment cycles that were administered by an estimate of the district's population, an underestimation of target populations may have led to this seemingly impossible feat. Health workers distributing

SMC may have found and provided doses to more children than are shown on the official lists. Household surveys, by contrast, can directly measure children who did not receive treatment, and consequently are thought to be a more reliable estimate of the true coverage rate.

## Reporting

The Department of Health Statistics and Information is responsible for collecting national health surveillance information, which includes monthly and trimester reports from the regional and prefectural levels. Starting in 2015, a monthly malaria-specific reporting system was implemented nationwide by the National Malaria Control Program (NMCP). It provided a more accurate basis for estimating the stock of malaria commodities such as rapid diagnostic tests and treatment medication. From 2015 to 2018, all participating health prefectures have been consistently reporting with close to 100 per cent completeness at the district level. The reports are manually filled out by local supervisors at health facilities, then sent to district offices for electronic aggregation. The NMCP produces a monthly bulletin that summarizes the data.

In 2017, Android phone use was introduced as a pilot to the campaign to improve data collection and transfer. This procedural change helped strengthen management of the distribution



**Figure 6.** Prefectural SMC Coverage by Cycle

cycles at the district level by improving the availability of more accurate data. Coverage data were sent from the phones to the health centres, aggregated at the health districts and then migrated to a central Catholic Relief Services server. This is an improvement over previous years where lost or mishandled distribution cards were a challenge.

The speed and accuracy of reporting play a significant role in the successful implementation of SMC, particularly since the program is active for only four months of the year. With quick access to key indicators, decision makers can make changes between cycles instead of having to wait until the next year.

## Global Supply Chain Management

Before and during the early years of the program in Guinea, ACCESS-SMC played an important role in ensuring the SMC medications' availability across the Sahel. Its actions highlighted the importance of the "strength in numbers" approach in dealing with pharmaceutical manufacturers, where a larger group of purchasers banding together can have significant influence. Subsequently, this strategy's sustainability was enhanced by transitioning to locally managing orders.

ACCESS-SMC worked extensively with the pharmaceutical market to enhance the supply side to the point where it was no longer restrictive to program implementation. In 2013, there were no manufacturers of SMC drugs prequalified by the WHO. ACCESS-SMC aimed to provide evidence on the viability of scaling up to encourage companies to invest in increased production capacity. This strategy hit a roadblock in 2015 when the only certified supplier of sulfadoxine (the active pharmaceutical for SMC), Shanghai Sanwei Pharmaceutical Company, exited the market. The departure caused a global shortage and subsequent reduction of the drug's availability. As of 2016, Guilin

Pharmaceutical Company was still the only producer of WHO-prequalified SP+AQ. However, the producer has significantly expanded its capabilities to meet market demand and added in-house production of sulfadoxine. A second manufacturer, S Kant, is also expected to enter the market in the near future.

Delays in drug procurement have sometimes affected cycle timings. For example, the third cycle of 2016 was delayed by ten days because supplies arrived late. ACCESS-SMC has implemented several strategies to mitigate these scenarios. In certain cases, leftover stock from previous years can be reallocated to avoid delays, such as during the first two SMC cycles in 2016. In another case, the orders were sent to the manufacturer two or three months later than originally planned. The shipments were air freighted at additional cost to avoid delaying delivery.

After ACCESS-SMC and Unitaaid ceased funding in 2017, responsibility for procurement shifted to an internal logistics committee. This group included the Procurement and Stockpile Management Team of the NMCP and both implementing partners (CRS/Global Fund and RTI/StopPalu+). The order quantity was based on the total number of eligible children with a 10 per cent adjustment margin. Adjustments cover fluctuations such as additional beneficiaries or loss of drugs. In general, this strategy makes sense where the effort of obtaining and controlling a more accurate order estimate outstrips the cost of including the extra margin.

Logistically, the government-run Pharmacie Centrale de Guinée (PCG) supplies all health facilities. Drugs are stored at the central depot in Conakry and then transported to each health centre. The health centres distribute products to CHWs every day, and unused stock is returned at the end of each day. However, in the last SMC cycle of 2017, stock-out of drugs was the second-most common reason for children not receiving SMC services.

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## Lessons Learned

Seasonal malaria chemoprevention (SMC) for children under the age of five in Guinea has achieved a mean 71.6 per cent coverage rate for a highly dispersed population, in a region with poor-quality infrastructure, at the height of the rainy season. Children have among the lowest access to health services in the country, so SMC is likely to have a disproportionately high impact for them.

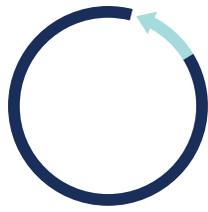
Four factors explain the program's success:

- **Hyperlocal delivery:** The program prioritized logistics and communications at the most granular level to adapt the distribution strategy to the unique needs of different locales.
- **Multilevel engagement and coordination:** Stakeholder needs and responsibilities at all levels of healthcare, government and external partnerships were coordinated to utilize each actor's strengths.
- **Integrated monitoring and evaluation:** The SMC program incorporated both collection and usage of monitoring and evaluation data into the program-delivery process to quickly identify and respond to issues as they arose.

- **Global supply chain management:** The initial coalition was able to aggregate pharmaceutical demand across countries to gain support from manufacturers.

Of course, numbers do not tell the whole story. When disaggregating at the prefecture level, there were a range of coverage rates from below 50 per cent to over 100 per cent. After surveying the accessible sources and documentation, we could not conclude which factors allow some prefectures in Guinea to achieve such high rates of coverage and what prevented other areas from achieving similarly high rates.

In the future, it would be important to explore through primary research more granular and direct learning about how the SMC program is addressing the discrepancy in prefecture coverage as well as other challenges. How was program sustainability maintained through scale-up? What are the limitations to current methods of beneficiary identification? How is the program affected by COVID-19? While there is still more to learn, the seasonal malaria chemoprevention program remains a fascinating study of a highly impactful health intervention that has improved the lives of many of Guinea's most vulnerable children.



# Reach Alliance

The **Reach Alliance** began in 2015 at the University of Toronto as the Reach Project, a student-led, faculty-mentored, multidisciplinary research initiative. Reach's unique approach uncovers how and why certain programs are successful in getting to some of the world's hardest-to-reach populations. Research teams, comprised of top students and faculty from across disciplines, spend twelve months investigating each case study. Once the data collection process is complete, teams write case reports that are published and disseminated across the Reach Alliance's diverse network of policymakers, practitioners, academics and business leaders.

Inspired by the United Nations' call to eliminate global poverty by 2030 as part of a set of Sustainable Development Goals (SDGs), our mission is to pursue the full achievement of the SDGs by equipping and empowering the next generation of global leaders to create knowledge and inspire action on reaching the hardest to reach.

[reachalliance.org](http://reachalliance.org)

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## Research Team



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**Noura Al-Jizawi** completed her Master of Global Affairs degree at the University of Toronto in 2019. She was a key leader in the Syrian uprising, and now works as a research assistant at the Citizen Lab at the Munk School of Global Affairs & Public Policy, focusing on interdisciplinary research and development.



**Jordan Imahori** completed his Bachelor of Arts in Economics at the University of Toronto in 2019. He is the director of operations at Timby where he helps design software to improve data collection and analysis at organizations operating in sub-Saharan Africa and South America.



**Stanley Zlotkin** (CM, OOnt, MD, PhD, FRCPC) is a professor of pediatrics, public health sciences, and nutritional sciences at the University of Toronto, a senior scientist at the Hospital for Sick Children Research Institute and a clinician/scientist in the Department of Paediatrics at SickKids. He received his MD degree from McMaster University, his fellowship training in pediatrics at McGill and his PhD in nutritional sciences from the University of Toronto. His current research and advocacy focuses on preventing malnutrition in children. He was awarded the HJ Heinz Humanitarian Award in 2001 for his international advocacy work for children, the CIHR National Knowledge Translation Award in 2006, the Order of Canada in 2007 and the Order of Ontario in 2016 for his contributions to improving the lives of children.



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