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Achieving catalytic expansion of seasonal malaria chemoprevention in the Sahel

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CATHOLIC RELIEF SERVICES

JANUARY 2017

The Cost of Seasonal Malaria Chemoprevention in the Sahel Region of Africa

msh

Management Sciences for Health

This report was prepared by Management Sciences for Health with funding from the UNITAID ACCESS-SMC project.

About ACCESS-SMC

ACCESS-SMC is a UNITAID-funded project, led by Malaria Consortium in partnership with Catholic Relief Services, which is supporting National Malaria Control Programs to scale up access to seasonal malaria chemoprevention (SMC) to save children's lives across seven countries in the Sahel sub-region of Africa. By demonstrating the feasibility and impact of SMC at scale, ACCESS-SMC will promote its wider adoption. For further information, visit www.access-smc.org and www.unitaid.org.

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Photo credit: Cherkaoui, Sylvain. *A child receives her first dose of SP+AQ .* August 9, 2015. Mali.

Included in the Annex is a list of individuals who contributed to this report.

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Key Words: seasonal malaria chemoprevention (SMC), malaria, cost, finance.

Contents

Acronyms

ACCESS-SMC	Achieving Catalytic Expansion of Seasonal Malaria Chemoprevention in the Sahel
AQ	Amodiaquine
CHAI	Clinton Health Access Initiative
CHW	Community health worker
CRR	Central River Region
CRS	Catholic Relief Services
CHW	Community health worker
iCCM	Integrated community case management
IPTi	Intermittent preventive treatment in infants
IPTc	Intermittent preventive treatment in children
IPTp	Intermittent preventive treatment in pregnant women
HF	Health facility
HFW	Health facility worker
LGA	Local government area
LSHTM	London School of Hygiene and Tropical Medicine
MoH	Ministry of Health
MoHs	Ministries of Health
MSH	Management Sciences for Health
NAFDAC	National Agency for Food and Drug Administration and Control
NGO	Non-governmental organization
NMCP	National Malaria Control Program
NMEP	National Malaria Elimination Programme
RDTs	Rapid diagnostic tests
SBCC	Social behavior change communication
SIAPS	Systems for Improved Access to Pharmaceuticals and Services project
SMC	Seasonal Malaria Chemoprevention
SP	Sulfadoxine-pyrimethamine
URR	Upper River Region
USAID	United States Agency for International Development
US	United States
WHO	World Health Organization
XAF	Central African CFA franc
XOF	West African CFA franc

Glossary

Adverse event: Any untoward (unwanted) occurrence in a patient (child) given a pharmaceutical product, which is not necessarily causally related to the treatment. An adverse event is considered any unfavorable or unintended symptom or disease (including laboratory findings temporally associated with use of a medicinal product), which may or may not be considered to be related to the medicinal product.

Caregiver: Family member who brings the child for SMC drugs and provides second and third doses of AQ to the child at home.

Child: Anyone under the age of 18. Children between 3-59 months (infants ages three to under 12 months and children ages 12 to 59 months) are eligible for in SMC as long as they meet all other eligibility criteria.

Community Health Worker (CHW): A community member who provides health services in the community on a voluntary or remunerated basis. Health services may include SMC.

Course: A course of treatment with SMC drugs over three days: one dose of SP and one daily dose of AQ for 3 days. Each child should take one course of SMC drugs each cycle and four courses each round.

Cycle: A one-month course of SMC drugs. There are four cycles in each round.

Distribution period: A period within each cycle when SP and AQ are distributed to all eligible children.

Distributor: Trained personnel, including community members or salaried health workers, who participate in the administration of SMC.

Door-to-door SMC delivery: When the drugs are distributed at a child's home.

Fixed-Point SMC delivery: When SMC drugs are delivered in a central location in or outside of the community.

Health Facility (HF): Place where children are referred by CHWs for fever, illness or side effect to SMC drugs. It is staffed by health providers trained in SMC and case management of childhood illnesses

Health Facility Worker (HFW): Individuals based in a health facility, who are trained and responsible for delivering SMC drugs, assessing for fever, managing cases of childhood malaria and other childhood illnesses, assessing and managing adverse events and serious adverse events

Mobile delivery: When SMC drugs are delivered in a location in hard-to-reach areas.

Pharmacovigilance: The science and activities relating to the detection, assessment, understanding and prevention of adverse effects or any other drug-related problem.

Referral: Sending sick children who cannot be managed at home to the health facility.

Round: One transmission season consisting of four cycles.

Severe adverse event: When the adverse event is life threatening, requires or prolongs hospitalization, results in disability or incapacity, results in congenital abnormality or birth defect, results in death, or may require intervention to prevent one of the outcomes listed above. *NB: adverse drug reaction and severe adverse drug reaction can only be used once the cause of the event has been conclusively determined to be related to the intake of SP or AQ.*

SMC delivery or distribution: The act of providing SMC drugs to children.

SMC drug administration: The act of giving the drugs to a child.

SMC medicines / SMC drugs: One dose of sulfadoxine / pyrimethamine (SP) and three doses of amodiaquine (AQ) given each month for four months to children between the ages of 3-59 months.

Executive Summary

Seasonal Malaria Chemoprevention (SMC), the intermittent administration of antimalarial medicine during the malaria season, is among the World Health Organization (WHO)'s key interventions for preventing malaria in children. SMC can help to avert millions of cases of plasmodium falciparum malaria and thousands of deaths per year[1] while significantly reducing the financial and economic burdens experienced by patients, families, and national health systems. In the Sahel sub-region of Africa, there are an estimated 25 million children ages 3-59 months who are eligible for SMC. Having a comprehensive understanding of the costs and impact of implementing SMC at a large scale could help countries effectively plan and advocate for the allocation of sufficient financial resources for the implementation of SMC.

To better understand the costs associated with delivering SMC, Management Sciences for Health (MSH) conducted cost analyses in the seven countries supported by the UNITAID-funded ACCESS-SMC project in 2015: Burkina Faso, Chad, Guinea, Mali, Niger, Nigeria and The Gambia. The results presented in this report are intended to provide information that can guide future SMC programming, facilitate comparisons of SMC efficiency, and improve the affordability and efficiency of SMC. Specifically, the objectives of this research were to:

1) Determine the total program costs and unit cost per child receiving the recommended four SMC cycles, based on the 2015 coverage results;
2) Identify the principal recurrent cost-drivers of SMC (e.g. drugs and supplies, distributor remuneration, management, supervision, meetings, training, and other recurrent costs);
3) Examine SMC distribution efficiency including the number of SMC drugs administered per distributor, ratio of distributors per supervisor, and SMC drug wastage;
4) Calculate the 2015 and 2016 financial gaps of reaching all eligible children for SMC in the seven countries; and
5) Contribute to global learning on the implementation and scale-up of SMC.

From September 2015 to January 2016, MSH staff collected programmatic and cost data in all seven ACCESS-SMC project countries and analyzed the costs using the spreadsheet-based SMC Costing and Financing Tool, developed by MSH.

In 2015, through support from ACCESS-SMC, an equivalent of 3.12 million children (3-59 months)[1] of the targeted 3.2 million children received SMC in the seven countries. This figure is derived from the 12.46 million SMC treatments that were administered by the project during the four monthly cycles provided in the seven ACCESS-SMC countries. The total number of SMC monthly cycles provided ranged from 308,830 in The Gambia to 3,149,867 in Nigeria.

[1] This figure is calculated by dividing the total number SMC treatments administered by four cycles. It does not represent the actual number of children who received four cycles. The coverage survey conducted by LSHTM indicates that many of the children received fewer than four cycles, meaning that more children were reached in total but some received three cycles or less.

In 2015, the total start-up costs for ACCESS-SMC were US $611,358 and the total recurrent costs were US $13.3 million. The recurrent costs ranged from US $508,312 in The Gambia to US $3.63 million in Nigeria. These figures are financial costs and do not include the opportunity costs of volunteer time or costs incurred by beneficiary families. They include the total direct costs incurred by the governments (e.g. personnel salaries) and by the implementing partners including a share of management salaries. They do not, however, include a share of other management costs, such as rent, office equipment and office supplies. They also do not include any costs incurred by UNITAID related to the oversight and coordination of ACCESS-SMC.

The unweighted average recurrent cost across the seven countries was US $1.16 per cycle or US $4.63 for four cycles. The weighted average recurrent cost was US $1.07 per cycle or US $4.27 for four cycles.[2]

The cost per cycle and per round of four cycles ranged from US $0.87 and US $3.48, respectively, in Niger to US $1.65 and US $6.58, respectively, in The Gambia. Caution should be used in comparing these figures across the countries due to differences in the circumstances of each country and program. The achievement of economies of scale could be one reason for variations in unit costs, as evidenced in The Gambia where the target population was much smaller than in the other countries and the cost per SMC round was highest.

The majority of financing of 2015 ACCESS-SMC project activities was from the UNITAID grant (ranging from to 76.85% in Guinea 99% in Chad of total recurrent costs); however, country governments made considerable contributions through the payment of the MoH personnel involved in SMC distribution.[3]

ACCESS-SMC, in addition to other implementing partners, contributed significantly to providing SMC for eligible children (3-59 months) in the seven countries in 2015. However, in some countries, the unmet need for SMC remains substantial, especially in Nigeria where an estimated 9.8 million children (3-59 months) did not receive SMC, since only four states implemented SMC, including two supported by ACCESS-SMC.[4] Considerable additional support and financial investments will be needed to reach all SMC eligible children in the seven countries.

This analysis presents several lessons and suggestions for further operations research:

[2] The unweighted figures are the averages of the country averages; the weighted figures were obtained by dividing the total recurrent cost across the six countries by the total numbers of cycles across the 7 countries.
[3] Including the personnel from the National Malaria Control Program (NMCP) and National Malaria Elimination Program (NMEP).
[4] According to the Nigeria Federal MoH, in 2015 other implementing partners supported SMC in Jigawa and Katsina states 2015; ACCESS-SMC implemented its program in Sokoto, and Zamfara.

Programmatic recommendations:

1) To be cost–effective and affordable, there must be high levels of SMC coverage among targeted populations. Moreover, SMC must be effectively and efficiently administered while program management and supervision should be organized to both minimize those costs while ensuring high-quality SMC provision.
2) To improve the sustainability of SMC, it will be essential to integrate SMC into government health services and to develop plans which ensure that governments take over key activities and related costs.
3) Information on the numbers of children who receive one, two, three, or four SMC cycles (and which cycles they received) should be routinely collected and reported on.

Recommendations for further research:

4) Studies are needed to determine the cost–effectiveness of the different SMC delivery mechanisms (e.g. door-to-door, fixed point, and mobile distribution) in each setting and the integration of SMC with other health services. This study should take into account the economic costs incurred by volunteer distributors and by families of beneficiaries, including productivity losses and out-of-pocket costs for accessing SMC.
5) A study on the feasibility of SMC integration into government services would help to facilitate its long-term sustainability.
6) Data should be collected on the utilization of health facility and community malaria treatment services to identify any impact from SMC on malaria service utilization.
7) A cost-benefit analysis comparing SMC with other malaria interventions would assist decision-makers to effectively allocate financial resources based upon evidence.

Background

Malaria remains a leading cause of morbidity and mortality worldwide, particularly in sub-Saharan Africa which accounts for 88% of the 214 million annual cases and 90% of the 438,000 annual malaria deaths globally.[2] Children are particularly affected by malaria; in 2015, malaria contributed to an estimated 306,000 under-five deaths globally, including 292,000 under-five deaths in the African region.[3]

A key intervention for preventing malaria among children is SMC – the intermittent administration of courses of an antimalarial medicine during the malaria season. The objective of SMC is to maintain therapeutic antimalarial medicine concentrations in the blood throughout the period of greatest malarial risk.[4] Endorsed by the World Health Organization in 2012, SMC could benefit 25 million children (3-59 months) living in the Sahel sub-region, averting millions of cases of *Plasmodium falciparum* malaria and thousands of deaths per year[5] while significantly reducing the financial and economic burdens experienced by patients, families, and national health systems.

The UNITAID-funded ACCESS-SMC project commenced in late 2014 and SMC distribution began in 2015 in seven countries in the Sahel - Burkina Faso, Chad, Guinea, Mali, Niger, Nigeria and

The Gambia. The project is due to run until 2017 with a second and final SMC distribution round planned for 2016. SMC is administered in four cycles per year. During each month, a first dose of sulfadoxine-pyrimethamine and amodiaquine (SP+AQ) is administered directly to each child (3-59 months) by a trained distributor on the first day of distribution and two more doses of AQ are administered by the child's caregiver at home on the second and third days.

Despite the feasibility, effectiveness, and potential impact of SMC, there has been limited documented evidence on the costs of SMC programs implemented at a large scale and in different country contexts. This lack of evidence can prevent donors and Ministries of Health (MoHs) from mobilizing and allocating financial resources for introducing or scaling-up SMC. Having a comprehensive understanding of the costs and impact of implementing SMC could help countries effectively plan or advocate for the allocation of sufficient financial resources. Moreover, countries which are transitioning from donor-funded programs would benefit from such evidence in order to plan the allocation of domestic financial resources.

To better understand the costs associated with SMC, Management Sciences for Health (MSH) on behalf of ACCESS-SMC, conducted cost analyses of the ACCESS SMC interventions in the seven countries for the 2015 distribution round. The results of these analyses are intended to provide information that can be used to guide future SMC programming, assist with conducting comparisons of efficiency, and improve the affordability and efficiency of SMC.

The body of this report covers the overall findings of the multi-country analysis while detailed country reports are provided in the Annexes. The specific objectives of this research were to:

1) Determine the total program costs and unit cost per child receiving the recommended four SMC cycles, based on the 2015 coverage results;
2) Identify the principal recurrent cost-drivers of SMC (e.g. drugs and supplies, distributor remuneration, management, supervision, meetings, training, and other recurrent costs);
3) Examine SMC distribution efficiency including the number of SMC drugs administered per distributor, ratio of distributors per supervisor, and SMC drug wastage;
4) Calculate the 2015 and 2016 financial gaps of reaching all eligible children for SMC in the seven countries; and
5) Contribute to global learning on the implementation and scale-up of SMC.

This cross-country analysis did not include the economic costs related to productivity losses and out-of-pocket costs incurred by families in accessing SMC and the opportunity costs incurred by volunteer distributors.

Also, this analysis did not seek to determine the quality of SMC distribution or the precise number of children who received the full three doses of treatment each cycle or who received the complete four monthly cycles of treatment.[5] While several of the possible demand-side

[5] The coverage surveys conducted by LSHTM provide some estimates on the numbers of cycles received by children.

determinants of SMC coverage are mentioned in this report, this study did not aim to explore the reasons for differing coverage rates across the countries. Lastly, neither the efficiency nor the cost-effectiveness of the different service delivery methods (door-to-door, fixed point, and mobile distribution) or of integration of SMC with other services were determined due to the lack of complete and reliable data from the countries. A study on the cost-effectiveness of the various distribution methods and of the integration of SMC with other services is planned for the 2016 SMC round.

Methods

For this analysis, MSH staff collected 2015 programmatic and cost data in all seven ACCESS-SMC project countries from September 2015 to January 2016. The data collection and initial analysis took an average of two weeks in-country. Data were collected at all levels of the health system:

1) Central level from the MoH/NMCP/NMEP and from implementing partner organizations (Catholic Relief Services, Malaria Consortium, and Speak Up Africa);
2) Regional/State level from MoH and implementing partner organization staff;[6]
3) District/Local Government Authority (LGA) level from the MoH staff;
4) Health facility level MoH staff; and
5) Community level

Using standard semi-structured questionnaires and data checklists, MSH staff conducted interviews with program managers, supervisors, and SMC distributors. Implementing partner non-governmental organizations (NGOs) and MoH/NMCP staff provided data on the costs of all inputs (e.g. equipment and drugs, travel and transportation costs, personnel salaries and incentives, meeting and training costs, and social mobilization). MSH staff also collected information on SMC distribution protocols as well as data on population coverage and the numbers of SMC administered. All data collected was for 2015 – the first year of SMC distribution under ACCESS-SMC.

In collaboration with MoH and implementing partner personnel, MSH staff visited an average of one district/LGA and five health facilities in each country, and conducted interviews with an average of three distributors and one direct supervisor per health facility, totaling approximately 15 distributors and five direct supervisors in each country. This sample was limited by time and budgetary constraints but was sufficient to provide a “reality check” of the national description and norms of the SMC program, to determine the actual structure and service delivery approach of the project at the community level, the supervision structure, and the involvement of the sub-national levels in implementing the project.

The sample of sub-national areas and health facilities visited was determined by the MoH/NMCP and implementing partner in each country. Selection was based mainly on ease of

[6] In Nigeria, Malaria Consortium also had staff at the State level.

access (i.e. time required to access the sites in the context of weather and road conditions) and availability of personnel (supervisors and SMC distributors) to participate in interviews. This small, purposive sample was used for collecting original data on the estimated time spent by SMC distributors and direct supervisors as well as for confirming data provided at the central level. These included personnel salaries and per diem payments received, numbers and types of training completed, and equipment used during SMC distribution. While it would have been preferable to visit a representative sample of program sites, this was not feasible due to time constraints.

The costs were analyzed using the SMC Costing and Financing Tool which was adapted from the USAID iCCM Costing and Financing Tool,[7] developed by MSH. During the design process, MSH reviewed a number of other tools and it was deemed that the adaptation of the USAID iCCM Costing and Financing Tool would be the easiest and most appropriate option for this analysis. Other SMC costing studies identified in the literature review (see below) indicated the use of spreadsheets to calculate the costs but it does not appear that any standard tools were used.

The costs were separated into start-up costs (i.e. those incurred at the beginning of the program) and recurrent costs (i.e. those that are repeated ever year). The figures are a mixture of standard and actual costs, obtained from accounting and budget records and through interviews, in what is sometimes known as an “ingredients” approach. These are financial costs and do not include the opportunity costs of volunteer time or costs incurred by beneficiary families. The costs do include the total direct costs incurred by the governments (e.g. personnel salaries) and by the implementing partners including a share of manager salaries. They do not, however, include a share of other management costs, such as rent, office equipment and office supplies. They also do not include any costs incurred by UNITAID related to the oversight and coordination of ACCESS-SMC. Definitions of the key cost categories are included in Table 1.

[7] MSH iCCM Costing and Financing Tool. Available at: http://www.msh.org/resources/integrated-community-case-management-costing-financing-tool

Table 1. SMC cost categories defined

Category	Definition and examples
Start-up costs	Costs incurred when a new program is started (i.e. on a one-time basis) and are not repeated every year. These costs include initial launch meetings, the production of videos, the development and recording of radio spots, the development of monitoring and evaluation plans, purchasing of initial equipment, one-time training, etc.
Recurrent costs	Costs incurred every year (e.g. drugs and supplies; SMC remuneration; management; supervision; meetings; training; etc.).
▪ **Drugs and supplies**	SP+AQ, sugar, dispensing envelopes/plastic bags for beneficiaries, and mark-up costs of SP+AQ (e.g. customs, transport, taxes, and fees).
▪ **Remuneration of SMC distributors**	Per diem and transport for SMC distributors in addition to salary costs incurred for MOHS personnel serving as SMC distributors (as in the case of Burkina Faso, Mali, and Nigeria).
▪ **Management**	Salary costs of implementing partners (MC and CRS) and staff from MoHs incurred for program management, reporting, attendance at meetings/training, supervision, etc. Also includes "top-up" payments provided from implementing partners to MoHS staff for their contributions to the project (separate from supervision per diem).
▪ **Supervision**	Per diem and transport for SMC supervisors at all levels of the health system (central, regional/state, district/LGA, health center, etc.).
▪ **Meetings**	Recurrent meeting expenses (supplies, food, room rental, per diem, etc.)
▪ **Training**	Training expenses (supplies, food, room rental, per diem, etc.)
▪ **Other recurrent program costs**	Distributor and supervisor equipment (e.g. t-shirts, cups, spoons, etc.), recurrent monitoring and evaluation activities, social mobilization activities (including per diem payments for community social mobilizers and playing of radio spots), satisfaction surveys, and other miscellaneous recurrent costs.

The cost of SMC drugs (see category "drugs and supplies") was calculated by multiplying the average unit purchase price plus additional unit mark-up costs (e.g. customs, transport, taxes, and fees) by the number of SMC drugs effectively administered. The total cost of drugs administered (included in this report) is not the same as the total cost of drugs procured since there were more drugs procured than consumed. The cost of drugs does not take into account any loss or wastage during transport and storage or any wastage during treatment (e.g. due to vomiting or non-consumption by the child).[8]

MSH conducted a separate literature review to collect comparable evidence on the costs of SMC as well as other mass administration campaigns of malarial drugs using community-based service delivery platforms (e.g. intermittent preventive treatment for pregnant women and infants). The objective of this literature review was to inform the overall methodology of the

[8] The wastage of drugs was reported by the implementing partner in each country and, in some cases, the definition may have varied. Among all countries, the estimated averaged unweighted wastage rate was 1.11% of total SMC administered.

costing studies, including the design of the SMC Costing and Financing Tool and the in-country data collection process. Of the 476 articles retrieved using the electronic online database MEDLINE, only three articles were determined relevant for this analysis (reviewers also checked the references of screened articles for any additional relevant articles). A summary of the findings of this literature review can be found in the discussion section and the full report is available on the ACCESS-SMC website.[6]

Results

Geographic and Population Coverage

The protocol for SMC administration[9] is standard across all seven ACCESS-SMC project countries. The first dose of SP+AQ is administered by a trained distributor on the first day and the remaining two doses of AQ are administered by the child's caregiver at home on the second and third day. There are, however, programmatic and operational differences among the countries which impact the cost of SMC. These differences include the scale of each program (i.e. geographic and population coverage), the number of days required per distribution cycle, the methods of SMC distribution, as well the numbers of SMC distributors, direct supervisors, and program support staff.

Among the seven ACCESS-SMC project countries, Guinea was the only country which had never previously implemented SMC. All the other countries had at some point supported SMC distribution beyond the scale of a pilot program (i.e. at district scale or beyond) with assistance from other donors.[10]

Through support from ACCESS-SMC, the seven countries implemented SMC during the four peak months of malaria transmission which varied depending on the seasonality of malaria. However, in Mali, it was reported that SMC distribution was delayed by one-month due to the late arrival of the SMC drugs.

Among the seven countries, the number of days for each cycle of SMC distribution ranged from four to five (see Table 2), depending on the expected number of children that SMC distributors could reach in the catchment area given issues of distance, accessibility, and weather. In the case of Guinea, which had never previously implemented an SMC program, the first cycle lasted three days but was deemed insufficient to cover the number of targeted children (3-59 months) due to issues of accessibility and therefore the remaining three cycles were extended to four days each.

The ACCESS SMC target population (i.e. children 3-59 months) among country programs ranged from 90,925 children in The Gambia to 809,638 children in Mali. The average ratio of the

[9] Eligible children (3-59 months) receive SP+AQ on a monthly basis over a four-month period during the peak malaria transmission season.

[10] Both Chad and Mali began SMC implementation in 2012. Burkina Faso, Niger, and Nigeria began SMC in 2013. The Gambia began SMC in 2014.

number of targeted children to SMC distributor was 158:1, ranging from 95:1 in Burkina Faso to 276:1 in Niger.

Nigeria deployed the largest number of trained distributors (7,954 distributors) while The Gambia deployed 582 distributors.[11] For the purpose of this analysis, the number of trained distributors comprises all those who participated in SMC distribution including volunteers and health facility personnel who assessed the eligibility of children and administered SMC, data recorders, and security guards who helped to organize crowds at fixed points (in the case of Niger).[12]

In Chad, Guinea, and The Gambia, a door-to-door distribution strategy was used; in the other countries a mix of distribution methods were used, comprising door-to-door, fixed point distribution, and mobile distribution (i.e. SMC distribution at fixed points in hard-to-reach areas). In Nigeria, for example, 7,954 trained distributors were responsible for distributing SMC by way of three distribution methods. This included 3,654 door-to-door distributors (1,827 two-person teams); 2,946 fixed point distributors (982 three-person teams); 1,354 health facility distributors (~451 three-person teams).

[11] In The Gambia, the ACCESS-SMC project trained 291 teams made up of one data collector and one SMC distributor (total: 582) and SMC cycles were carried out consecutively (not simultaneously) in two regions.
[12] This number of does not include volunteers trained on social mobilization who did not participate in the distribution of SMC.

Table 2. ACCESS-SMC geographic and population coverage (2015)

	Burkina Faso	Chad	Guinea	Mali	Niger	Nigeria	The Gambia
Year of SMC commencement in-country [13]	2013	2012	2015	2012	2013	2013	2014
Months of ACCESS-SMC distribution	July - November 2015	July - October 2015	July - October 2015	August – November 2015	August - November 2015	August - November 2015	August - November 2015
Number of distribution cycles per round	4	4	4	4	4	4	4
Number of days per SMC distribution cycle	4 days	4 days	4 days (1st cycle: 3 days)	5 days	5 days	4 days	5 days
Geographic coverage	11 districts in 3 regions	6 districts in 2 regions	6 districts in 3 regions	14 districts in 5 regions	8 districts in 3 regions	17 LGAs in 2 states	18 districts in 2 regions
SMC distribution method(s)	Door-to-door & fixed point	Door-to-door	Door-to-door	Fixed point & mobile	Fixed point & door-to-door[14]	Door-to-door & fixed point	Door-to-door
Number of SMC distributors	6,855	2,087	1,217	4,606	2,161	7,954	582
Number of direct supervisors of SMC distributors	671	299	156	658	350	182	65
Target population (3-59 months)	649,693	275,000	210,047	809,638	595,901	792,133	90,925
Target population (3- <12 months)	96,607	63,250	42,023	141,353	106,888	150,088	15,859
Target population (>12-59 months)	553,086	211,750	168,024	668,285	489,013	642,045	75,066
Ratio of target population per distributor	95	132	173	176	276	100	156

[13] Before 2015, SMC was supported by other projects not by the ACCESS-SMC project which began SMC distribution in 2015.
[14] Niger introduced door-to-door SMC distribution in the fourth cycle in Maradi district.

SMC Coverage and Utilization

The total number of monthly SMC cycles administered ranged from 308,830 in The Gambia to 3,147,869 in Nigeria (Table 3). Dividing the aforementioned numbers by four cycles yields an estimation of the *equivalent number of children (3-59 months)* who received four cycles of SMC. These figures can be compared with the initial target populations.

The equivalent number of children (3-59 months) who received four cycles of SMC ranged from 77,208 in The Gambia to 787,467 in Nigeria. These equivalent figures do not represent the actual number of children (3-59 months) who received four complete cycles of SMC, which were fewer, as explained below.

The SMC coverage percentages were calculated by dividing the equivalent numbers of children (3-59 months) reached by the estimated target populations. These ranged from 69.97% in Niger to 104.73% in Burkina Faso (see Table 3). SMC coverage rates of more than 100% were likely due to a combination of several factors: an initial underestimation of the target population; or children who came from outside the catchment area; or children outside of the age range of the target population (3-59 months) who received SMC. In general, the demand for SMC increased between the first and fourth distribution cycles with the exception of in Mali where SMC coverage decreased after the second cycle.

Sample coverage surveys conducted in each country by research groups, coordinated by the London School of Hygiene and Tropical Medicine (LSHTM), showed that the numbers of children who received the full four cycles ranged from 22.7% in Chad to 69.2% in Burkina Faso, and the numbers of children who received at least three cycles of SMC ranged from 56.2% in Mali to 84.3% in The Gambia. According to the LSHTM coverage survey conducted in Niger, SMC coverage varied by district. In Aguié, 45% of eligible children received four cycles of SMC and 71% received at least three cycles of SMC. In Madaoua, 43% of children received four SMC cycles and 64% received at least 3 cycles. In Maradi, only 10% of children received at least three cycles and 25% of children received zero cycles. In Zinder, only 13% of children received at least three cycles and 63% received zero cycles.

Table 3. ACCESS-SMC coverage (2015)

	Burkina Faso	Chad	Guinea	Mali	Niger	Nigeria	The Gambia
Total number of SMC cycles administered	2,721,731	1,058,324	805,131	2,751,353	1,667,890	3,149,867	308,830
Equivalent number of children who received four monthly cycles (3-59 months) [a]	680,433	264,581	201,283	687,838	416,973	787,467	77,208
Percent coverage (3-59 months)	104.73%	96.21%	95.83%	84.96%	69.97%	99.41%	84.91%
Equivalent number of children who received four monthly cycles (3- <12 months) [a]	94,556	46,618	42,715	132,635	74,793	151,432	12,408
Percent coverage (3- <12 months)	97.88%	73.70%	101.65%	93.83%	69.97%	100.89%	78.24%
Equivalent number of children who received four monthly cycles (>12-59 months) [a]	585,877	217,964	158,074	555,203	342,179	636,035	64,799
Percent coverage (>12-59 months)	105.93%	102.93%	94.08%	83.08%	69.97%	99.06%	86.32%
2015 SMC round results (children 3-59 months)							
Cycle 1	648,290	250,233	174,448	691,231	342,837	736,858	71,121
Cycle 2	672,185	265,193	211,997	711,973	415,255	744,827	84,298
Cycle 3	698,877	270,517	208,238	687,709	432,321	840,392	76,489
Cycle 4	702,379	272,381	210,448	660,440	477,477	827,790	76,922
Percent of children (3-59 months) receiving four full cycles of SMC, based on LSHTM coverage survey	69.2%	22.7%	53.6%	37.7%	Varied by district	42.4%	55.5%
Percent of children (3-59 months) receiving at least three cycles of SMC, based on LSHTM coverage survey	83.9%	60.5%	71.6%	56.2%	Varied by district	61.4%	84.3%

[a] *This figure is calculated by dividing the total number of SMC cycles administered by four cycles and does not represent the actual number of children who received four cycles.*

SMC coverage could be influenced by a number of supply- and demand-side factors which should be explored further to better understand their impact. For instance, countries reported that SMC delivery was impacted by the timing of SMC distribution which coincides with both the rain and farming seasons. During times of rain, people often stay inside their homes (and are reluctant to travel to distribution points) or are farming away from their homes. Bad weather conditions could also have impacted the efficiency of SMC distributors (particularly those conducting door-to-door distribution) and corresponding coverage rates. Following the first distribution cycle in Guinea, for example, ACCESS-SMC purchased umbrellas for all of its SMC distributors to facilitate their movement for door-to-door SMC distribution.

The maturity (i.e. years of previous implementation) of SMC programs also varied across countries and this could have impacted the initial coverage among targeted populations. However, 2015 was the first year of SMC implementation in Guinea and the overall coverage was relatively high compared to Mali which has supported SMC distribution since 2012. Additional research is necessary to determine if, and how, SMC maturity could have affected coverage in sub-national areas with and without previous SMC programs.

SMC Cost Analysis

Featured in Table 4 are the results of the cost analyses which are presented in United States Dollars.[15]

Table 4. Total program costs and cost for one and four SMC cycles (2015, US $)

	Burkina Faso	Chad	Guinea	Mali	Niger	Nigeria	The Gambia
Total program costs	$2,808,875	$1,280,489	$1,082,096	$2,846,692	$1,501,826	$3,842,413	$564,323
Total recurrent costs	$2,671,886	$1,230,840	$1,032,149	$2,786,611	$1,452,554	$3,633,004	$508,312
Total start-up costs	$136,989	$49,649	$49,947	$60,081	$49,272	$209,409	$56,011
Average equivalent recurrent cost per child (3-59 months) for four SMC cycles [a]	$3.93	$4.64	$5.13	$4.05	$3.48	$4.61	$6.58
Average equivalent recurrent cost per cycle (3-59 months)	$0.98	$1.16	$1.28	$1.01	$0.87	$1.15	$1.65

[a] *This figure is based on the equivalent number of children (3-59 months) who received four SMC cycles.*

Total program costs are divided into start-up and recurrent costs. The start-up costs of an SMC program represent those incurred on a one-time basis such as initial launch meetings, the production of videos, the development and recording of radio spots, and other activities that would not need to be repeated each year.[16] The recurrent costs refer to those incurred every year (e.g. for drugs, equipment, recurrent meetings and training). Costs incurred when a new program is started (i.e. on a one-time basis) and are not repeated every year.

In four countries, the total start-up costs ranged from US $49,649 to US $60,081 (see Table 5). However, in Burkina Faso and Nigeria, the start-up costs totaled US $136,989 and US $209,409, respectively. The start-up costs are broken down into training, meetings and other miscellaneous activities (e.g. social and behavior change activities, initial monitoring evaluation activities, creation of job aides, etc.). In Burkina Faso, start-up costs included those for initial advocacy and planning meetings as well as for the creation of a monitoring and evaluation plan, conducting a situational analysis, creating and recording radio messages, and field-testing logos and job aides. In Nigeria, start-up costs included a logistics management training organized by

[15] The following exchange rates were used for this analysis: 1 USD is equivalent to 591 West African CFA (XAF); 591 Central African CFA (XOF); 7730.75 Guinean Francs; 160.85 Nigerian Naira and 40 Gambian Delasi.
[16] Start-up costs did not include initial trainings conducted in Senegal and Morocco.

MSH, start-up meetings and situational analyses, social behavior change communication (SBCC) planning and development of communications materials. It was assumed that start-up costs were incurred on a one-time basis and would not need to be repeated for subsequent years of ACCESS-SMC.

Table 5. Total start-up costs (US $, 2015)

	Burkina Faso	Chad	Guinea	Mali	Niger	Nigeria	The Gambia
Total start-up costs [a]	$136,989	$49,649	$49,947	$60,081	$49,272	$209,409	$56,011
Training	$0	$17,224 (34.69%)	$0	$0	$0	$23,870 (11.40%)	$0
Meetings	$35,531 (25.94%)	$1,100 (2.22%)	$6,604 (13.22%)	$6,864 (11.42%)	$12,906 (26.19%)	$115,701 (55.25%)	$16,782 (29.96%)
Other	$101,458 (74.06%)	$31,325 (63.09%)	$43,344 (86.78%)	$53,218 (88.58%)	$36,365 (73.81%)	$69,838 (33.35%)	$39,229 (70.04%

[a] *International ACCESS-SMC training for program staff were excluded from the start-up costs including a Training of Expert Trainers and a Pharmacovigilance Training in Senegal and in Morocco, respectively. In Nigeria, a start-up training on logistics management training was included (this was not carried out in other countries).*

The total recurrent costs of the program ranged from US $508,312 in The Gambia (which had the lowest target population) to US $3,633,004 in Nigeria (which had the second highest target population after Mali). Additional details on the breakdown of the recurrent costs can be found in the country reports in the Annexes.

The unweighted average recurrent cost per cycle across the seven countries was US $1.16 per cycle or US $4.63 for a complete round of four cycles of SMC.[17] The cost per cycle and per round of four cycles ranged from US $0.87 and US $3.48, respectively, in Niger to US $1.65 and US $6.58, respectively, in The Gambia.

Caution should be used in comparing these figures across the countries due to differences in the circumstances of each country and program. Economies of scale could be one reason for variations in unit costs, such as in the case of The Gambia, where the targeted population was much smaller than in the other countries. The cost of four cycles is expressed as the equivalent cost of covering one child for four full cycles and was calculated by dividing the total number of cycles by four. These figures exclude the costs related to the wastage of drugs and assume that the child's caregiver successfully administered the remaining two doses of AQ at the household level. Therefore, the average recurrent cost of four cycles represents the equivalent cost of providing SMC to one child for four months.

The recurrent costs of SMC programs are driven by the number of children who received SMC and the mixture of variable and fixed costs. Variable costs are primarily comprised of the costs of SMC drugs and supplies (e.g. sugar and plastic bags or dispensing envelopes for storing

[17] These are the average costs of treating all of the children treated, including children who were outside the recommended age range and children who received repeat doses due to vomiting.

drugs) and these vary directly with the numbers of children who received SMC.[18] The distributor remuneration and other distribution costs such as transport of distributors varies to some degree with the numbers of children treated.

The fixed costs, which should not significantly change with the level of SMC coverage within the targeted sub-national areas,[19] include the costs related to management, supervision, meetings, training, and social mobilization. If more sub-national areas were to be targeted, then these costs would increase.

The breakdown of recurrent costs indicates some of the reasons for the differences in costs across the countries (Table 6). The Gambia, where the average equivalent recurrent cost per child (3-59 months) for four SMC cycles was highest at US $6.58, had a relatively low number of children targeted and a relatively high expenditure on remuneration for SMC distributors, supervision, and training (US $1.32, US $1.14 and US $1.31, respectively). Guinea, where the average equivalent recurrent cost per child (3-59 months) was second highest at US $5.13, had the second lowest number of targeted children but had the highest unit cost of drugs and supplies (US $1.52) and the third highest unit cost of supervision (US $1.01). Variations in the cost of drugs and supplies per child (3-59 months) receiving four cycles of SMC were mainly due to differences in custom levies, handling, storage, and transport costs within the countries.[20]

Economies of scale affect the average equivalent recurrent cost per child (3-59 months) to some degree, in terms of the numbers of children who received SMC and the relatively fixed costs of management and meetings. However, the variations in the average equivalent recurrent cost per child (3-59 months) appear to relate more to variations in variable costs (e.g. the cost of drugs and supplies and remuneration of SMC distributors).

[18] The cost of drugs and supplies is estimated by multiplying the standard amounts required for each child. Therefore, the costs do not include wastage or any losses incurred in drugs during storage or handling.
[19] If coverage expands to new a new sub-national area (e.g. regions or districts) then additional fixed costs for sub-national management, supervision, etc. would be incurred.
[20] It is important to note that the categorization of costs provided by the country programs varied across the countries which makes the comparisons of some cost elements less than precise.

Table 6. Recurrent costs and average equivalent recurrent cost per child (3-59 months) for four SMC cycles (2015, US $)

Coverage	**Burkina Faso**	**Chad**	**Guinea**	**Mali**	**Niger**	**Nigeria**	**The Gambia**
Target population (3-59 months)	**649,693**	**275,000**	**210,047**	**809,638**	**595,901**	**792,133**	**90,925**
Equivalent number of children (3-59 months) who received four cycles of SMC	680,433	265,354	201,283	687,838	416,973	787,467	77,208
Recurrent costs	**Burkina Faso**	**Chad**	**Guinea**	**Mali**	**Niger**	**Nigeria**	**The Gambia**
Drugs and supplies	$1,000,101	$355,291	$305,396	$890,239	$542,200	$969,070	$112,080
Remuneration of SMC distributors	$603,904	$169,482	$118,019	$1,063,617	$215,740	$993,805	$101,850
Management	$352,709	$115,976	$169,355	$366,246	$501,429	$534,894	$64,376
Supervision	$161,864	$388,662	$203,185	$266,252	$106,955	$159,963	$88,221
Meetings	$210,639	$33,433	$21,945	$56,645	$13,538	$181,387	$4,231
Training – recurrent	$136,287	$83,399	$36,304	$46,509	$43,548	$619,645	$101,203
Other recurrent program costs	$206,381	$84,597	$177,946	$97,103	$29,143	$174,242	$36,351
Total	**$2,671,886**	**$1,230,840**	**$1,032,149**	**$2,786,611**	**$1,452,554**	**$3,633,004**	**$508,312**
Percent of recurrent costs, by cost category	**Burkina Faso**	**Chad**	**Guinea**	**Mali**	**Niger**	**Nigeria**	**The Gambia**
Drugs and supplies	37.43%	28.87%	29.59%	31.95%	37.33%	26.67%	22.05%
Remuneration of SMC distributors	22.60%	13.77%	11.43%	38.17%	14.85%	27.35%	20.04%
Management	13.20%	9.42%	16.41%	13.14%	34.52%	14.72%	12.66%
Supervision	6.06%	31.58%	19.69%	9.55%	7.36%	4.40%	17.36%
Meetings	7.88%	2.72%	2.13%	2.03%	0.93%	4.99%	0.83%
Training - recurrent	5.10%	6.78%	3.52%	1.67%	3.00%	17.06%	19.91%
Other recurrent program costs	7.72%	6.87%	17.24%	3.48%	2.01%	4.80%	7.15%
Total	100%	100%	100%	100%	100%	100%	100%
Average equivalent recurrent cost per child (3-59 months) for four SMC cycles,[a] by cost category	**Burkina Faso**	**Chad**	**Guinea**	**Mali**	**Niger**	**Nigeria**	**The Gambia**
Drugs and supplies	$1.47	$1.34	$1.52	$1.29	$1.30	$1.23	$1.45
Remuneration of SMC distributors	$0.89	$0.64	$0.59	$1.55	$0.52	$1.26	$1.32
Management	$0.52	$0.44	$0.84	$0.53	$1.20	$0.68	$0.83
Supervision	$0.24	$1.46	$1.01	$0.39	$0.26	$0.20	$1.14
Meetings	$0.31	$0.13	$0.11	$0.08	$0.03	$0.23	$0.05
Training - recurrent	$0.20	$0.31	$0.18	$0.07	$0.10	$0.79	$1.31
Other recurrent program costs	$0.30	$0.32	$0.88	$0.14	$0.07	$0.22	$0.47
Total	**$3.93**	**$4.64**	**$5.13**	**$4.05**	**$3.48**	**$4.61**	**$6.58**

[a] *This figure is based on the equivalent number of children (3-59 months) who received four SMC cycles.*

Figure 1. Total recurrent costs for ACCESS-SMC by country (2015, US $)

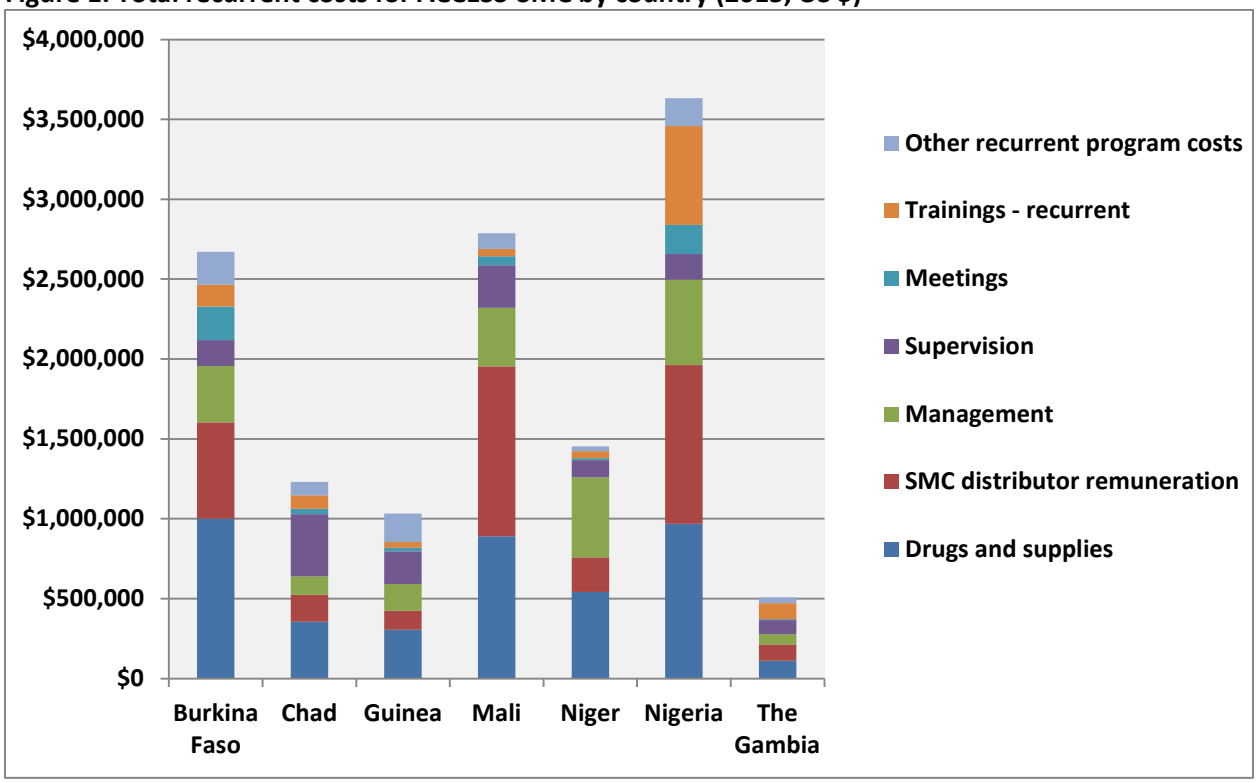
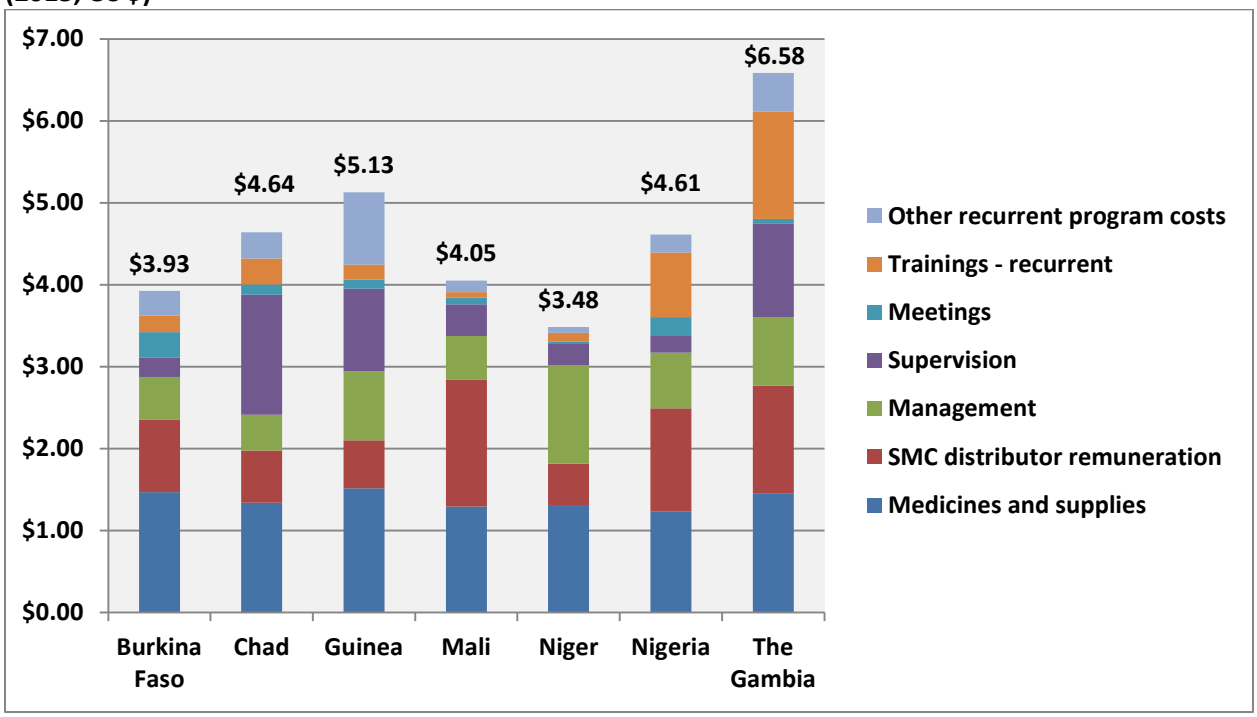


Figure 2. Average equivalent recurrent cost per child (3-59 months) for four SMC cycles by country (2015, US $)



This cross-country comparison of recurrent costs does not provide any insight into the relative cost-effectiveness of each distribution method (e.g. door-to-door, fixed point, and mobile distribution) or of the integration of SMC with other health services (e.g. malnutrition screening, malaria case management, Vitamin A distribution, etc.). Such analysis requires additional data which was not available at the time of writing this report.[21]

SMC Financing

The majority of the ACCESS-SMC project activities were financed by UNITAID; however, the country governments also covered a substantial portion of the costs, often in the form of MoH personnel salaries (see Table 7). UNITAID contributions ranged from 76.85% of the total recurrent costs in Niger to 98.88% of the total recurrent costs in Chad. As SMC becomes more established, it will be essential to ensure that it is integrated into government health services so it can be sustained with minimal donor support. Additional information on the financing of programs can be found in the Annexes.

Table 7. Financing of ACCESS-SMC - recurrent costs (2015, US $)

	Burkina Faso	Chad	Guinea	Mali	Niger	Nigeria	The Gambia
Total recurrent costs	$2,671,886	$1,230,840	$1,032,149	$2,786,611	$1,452,554	$3,633,004	$508,312
UNITAID contributions	$2,550,391 (95.45%)	$1,217,089 (98.88%)	$974,118 (94.38%)	$2,557,223 (91.77%)	$1,116,297 (76.85%)	$3,176,562 (87.44%)	$478,112 (94.06%)
Government contributions	$121,494 (4.55%)	$13,751 (1.12%)	$58,031 (5.62%)	$214,144 (7.68%)	$336,257 (23.15%)	$456,442 (12.56%)	$30,201 (5.94%)
Other contributions	$0	$0	$0	$15,244 (0.55%)	$0	$0	$0

SMC Efficiency

The efficiency of SMC distribution can be measured to some degree using the average number of children receiving SMC per individual distributor. However, these ratios cannot be compared across the countries, because they are dependent on the SMC distribution system(s) used and several aforementioned contextual and programmatic factors. These include the distance from health facilities to households, distance between households, numbers of eligible children per household, the demand for SMC among the target population, and weather conditions, among other factors. Moreover, the quantity of SMC administered per cycle (i.e. number of children reached in addition to the wastage of SMC drugs) varies depending on the number of days per distribution cycle which is different across countries.

[21] A cost-effectiveness analysis of distribution methods is planned for the 2016 SMC round to compare the costs and numbers of SMC administered by distribution method.

The average number of SMC treatments effectively administered (i.e. excluding wastage of SMC and doses not consumed by children)[22] per individual SMC distributor were 31 per day, ranging from 25 in Burkina Faso to 44 in Guinea (Table 8).

While all SMC distributors reported working throughout the day during SMC distribution cycles, certain cadres of distributors (e.g. fixed point distributors in Burkina Faso) reported only providing SMC to children who presented at the health facility for SMC distribution. This would be one reason why the average number of children treated by a distributor per day was relatively low at 25.

The integration of SMC with other services may also have affected the numbers of children covered per distributor. In Mali, for example, the SMC distributors reported using rapid diagnostic tests (RDTs) to test febrile children for malaria and making referrals to health centers for those children who tested positive for malaria. The additional time required to administer an RDT could have affected the efficiency of SMC distribution.

At the time of reporting, data on SMC wastage ranged from 0.40% in Chad to 1.96% in Mali of the total SMC effectively administered. The wastage of SMC drugs was reported by the implementing partner in each country and, in some cases, the definition of wastage may have varied. For instance, if a child vomits the first dose of SP+AQ, it may be recorded as wastage; however, in some cases, the second and third doses of AQ could be salvaged for additional use. Nevertheless, the wastage of SMC contributes to higher costs of distribution due to the loss of SMC drugs and forfeited time. According to SMC guidelines, SMC distributors must wait 30 minutes before providing a second dose of SMC to children who vomit after receiving the first dose. It is possible that wastage of SMC due either to contamination (i.e. tablets that fall on the ground) can be effectively reduced by using medicine grinders (i.e. pill crushers) as demonstrated in The Gambia; however, evidence is currently unavailable.

The average ratio of total SMC distributors per direct supervisor was 13 : 1, ranging from 6 : 1 in Niger to 44 : 1 in Nigeria (see Table 8); however, this ratio varied depending on the type of SMC distributors (e.g. door-to-door, fixed point, and mobile). While supervision is important to ensure the quality of SMC distribution, reporting, and dissemination of messages to caregivers, it was not possible to determine the quality of supervision provided to distributors and whether this level of quality varied depending on the ratio of supervisors to distributors. Due to lack of information, it was also not possible to compare supervision efficiencies (e.g. number of visits per SMC distributor).

[22] Defined as SMC drugs that were either administered but not effectively administered due to children vomiting or damaged (e.g. SMC tablet that fell on the ground and is unusable).

Table 8. SMC distribution efficiency (2015)

	Burkina Faso	Chad	Guinea	Mali	Niger	Nigeria	The Gambia
Total SMC administered by distributors (including the wastage of drugs)	2,747,443	1,065,674	812,021	2,806,247	1,695,426	3,198,414	310,241
Total SMC effectively administered by distributors (excluding wastage)	2,721,731	1,061,417	805,131	2,751,353	1,667,890	3,149,867	308,830
Total wastage of SMC	25,712	4,257	6,890	54,894	27,536	48,547	1,411
Wastage as percent of total SMC distributed	0.94%	0.40%	0.85%	1.96%	1.62%	1.52%	0.45%
Equivalent number of children (3-59 months) who received four cycles of SMC [a]	680,433	265,354	201,283	687,838	416,973	787,467	77,208
Actual SMC treatments provided per distributor per day	25	32	44	30	39	25	27
Actual ratio of distributors per direct supervisors[23]	10:1	7:1	8:1	7:1	6:1	44:1	9:1

a This figure is calculated by dividing the total number of SMC cycles administered by four cycles and does not represent the actual number of children who received four cycles.

2015 SMC Gap Analysis

The unmet need for SMC among all eligible children (3-59 months) ranged from 13,717 in The Gambia to 9.8 million in Nigeria (Table 9). These figures represent the total number of eligible children (3-59 months) that were not provided with SMC in 2015 from all implementing partners. These figures on the total number of eligible children and numbers of children reached were provided by implementing partners and MoHs/NMCPs in each country.

The unmet need figures include children (3-59 months) who were targeted but not reached by the ACCESS SMC project. Among the areas targeted by ACCESS-SMC, the number of children with unmet need ranged from 4,666 in Nigeria to 178,928 in Niger. In Burkina Faso, ACCESS-SMC reached surpassed its initial target population, providing SMC to an additional 30,740 children (3-59 months).

In all seven countries, ACCESS-SMC significantly contributed to SMC efforts. For example, in Guinea and The Gambia, ACCESS-SMC was the sole implementing partner supporting SMC. In

[23] In Burkina Faso, the ratio of total SMC distributors for door-to-door and fixed point distribution (6,855) to direct supervisors (671) was 10.22 : 1. However the ratio or door-to-door distributors (6,500) to supervisors (671) was: 9.69:1. In Mali, the ratio total SMC distributors for mobile and fixed point distribution (4,606) to supervisors (658) was 7:1.However, the ratio of mobile distributors (3,172) to supervisors (658) was 5:1.In Nigeria, the ratio of total SMC distributors for door-to-door, fixed point, and health center distribution (7,954) to ward supervisors (182) was 44: 1. However, the ratio of door-to-door distributors (3,654) to ward supervisors (182) was 20: 1.

Mali, ACCESS-SMC provided SMC to an estimated 49.01% of the equivalent number of children (3-59 months)[24] who received four cycles of SMC, complementing the efforts of other partners including USAID/PMI, ALIMA, Mali MoH/PNLP, UNICEF, Médecins Sans Frontières (MSF)-France, and Action Contre La Faim (ACF). In Chad, ACCESS-SMC reached an estimated 33.59% of the equivalent number of children (3-59 months) who received four cycles of SMC (Table 9).

Based on the estimated average equivalent recurrent cost of treating one child (3-59 months) for four cycles in 2015, the estimated financial gaps for expanding SMC coverage to all eligible children (3-59 months) in 2015 ranges from approximately US $90,308 in The Gambia to approximately US $45 million in Nigeria. These estimates assume that no additional start-up costs would be needed and no additional economies of scale would be achieved. Moreover, these estimates do not take into consideration key variables such as distance or potential for additional supervision, among others. It should be noted that the estimates for Nigeria may be low, since expanding coverage would involve starting in other provinces where the project did not operate in 2015. Finally, since the cost figures are based on four cycles of treatment and in some cases not all children received the full four cycles, the actual cost of providing four full cycles of SMC to child would likely be higher since it would require more supervision and follow-up.

These results will allow MoHs to estimate the percentage of funding for procurement for SMC products and delivery by each implementing partner and donor, in addition to funding provided by UNITAID through ACCESS-SMC. However, key costs related to program management, supervision, training, and meetings may differ significantly among implementing partners.

[24] Calculated by dividing the total number of cycles by four.

Table 9. Unmet gap of SMC coverage and costs (2015, US $)

	Burkina Faso	Chad	Guinea	Mali	Niger	Nigeria	The Gambia
Children (3-59 months) eligible for SMC	2,503,937	1,490,632	415,622	2,897,966	3,700,000	10,851,345	90,925
Equivalent number of children (3-59 months) who received four SMC cycles through ACCESS-SMC [a]	680,433	265,354	201,283	687,838	416,973	787,467	77,208
Equivalent number of children (3-59 months) who received four SMC cycles by other implementing partners [a]	273,614	168,969	0	705,417	206,704	180,295	0
Equivalent number of children (3-59 months) who received four SMC cycles by all implementing partners (including ACCESS-SMC) [a]	954,047	434,324	201,283	1,393,255	623,677	967,762	77,208
Percent of all eligible children (3-59 months) reached by ACCESS-SMC	27.17%	17.80%	48.43%	23.74%	11.27%	7.26%	84.91%
Percent of eligible children (3-59 months) reached by all implementing partners (including ACCESS-SMC) [b]	38.10%	29.14%	48.43%	48.08%	16.86%	8.92%	84.91%
2015 gap analysis							
Eligible children (3-59 months) with unmet need for SMC	1,549,890	1,056,309	214,339	1,504,711	3,076,323	9,883,583	13,717
Average number of children not reached by ACCESS-SMC in targeted districts	[d]	9,646	8,764	121,800	178,928	4,666	13,717
Percent of eligible children with unmet need for SMC [c]	61.90%	70.86%	51.57%	51.92%	83.14%	91.08%	15.09%
Cost of reaching additional children with unmet need	$6.1 million	$4.9 million	$1.1 million	$6.1 million	$10.7 million	$45.6 million	$90,308

[a] This figure is calculated by dividing the total number of cycles by four and does not represent the actual number of children who received four cycles.
[b] More children were reached but not all of them received the full four cycles.
[c] Some of the children included under unmet need may have received at least one cycle of SMC but not all four cycles.
[d] In Burkina Faso, the number of cycles administered was higher than the target and so this number is showed as zero.

2016 SMC Gap Analysis

Based on data from implementing partners and MoHs/NMCPs, the projected unmet need for SMC in the countries in 2016 was most significant in Nigeria with a gap of nearly 9.5 million children (Table 10). In 2016, ACCESS-SMC plans to scale-up SMC coverage in all countries with the exception of The Gambia, which has maintained its 2015 target population estimate for 2016 based on a revised population estimate of total eligible children.

The estimated cost of reaching children targeted for SMC (2016) in each country is based on the average equivalent recurrent cost per child for four cycles of SMC estimated in 2015 and assumes that no additional start-up costs would be needed and no additional economies of scale would be achieved. These figures do not include any additional cost needed for additional supervision and follow-up to ensure that all children receive the full four cycles of treatment. It should also be noted that inflation is not included. These figures may result in an underestimation of the cost in countries, such as in Nigeria, where expanding SMC coverage would involve implementing in new sub-national areas (e.g. States and LGAs).

Table 10. Unmet gap of SMC coverage and costs (2016, US $)

	Burkina Faso	Chad	Guinea	Mali	Niger	Nigeria	The Gambia
Children (3-59 months) eligible for SMC	2,576,067	1,544,295	438,123	2,982,007	3,840,600	11,198,591	90,925
Children (3-59 months) targeted by ACCESS-SMC	1,394,653	518,656	438,123	1,461,520	1,210,499	1,735,602	90,925
Children (3-59 months) targeted by other implementing partners	1,181,414	411,948	0	411,948	1,056,127	0	0
Children (3-59 months) targeted by all implementing partners	2,576,067	930,604	438,123	1,873,468	2,266,626	1,735,602	90,925
Percent of all eligible children (3-59 months) targeted for SMC by ACCESS-SMC	54.14%	33.59%	100.00%	49.01%	31.52%	15.50%	100.00%
2016 gap analysis							
Children (3-59 months) with unmet need for SMC	0	613,691	0	1,108,539	1,573,974	9,462,989	0
Cost of reaching children targeted for SMC by all implementing partners (using 2015 unit costs)	$10.1 million	$4.3 million	$2.2 million	$7.6 million	$7.9 million	$8.0 million	$598,621
Cost of reaching children with unmet need (using 2015 unit costs)	$0	$2.8 million	$0	$4.5 million	$5.5 million	$43.7 million	$0

Discussion

A comprehensive literature review[7] conducted by MSH identified three original costing studies relating to community-based service delivery.[8 9 10] The costs from these and other studies were inflated and presented as US dollar 2010 equivalents in a report by Pitt *et al* for the World Health Organization Technical Expert Group on Preventive Chemotherapy.

For the purposes of comparison with ACCESS-SMC results, the most relevant figures in the *Pitt et al* report are the costs per child per month of SP+AQ delivered by CHWs. These figures were US $0.55 per month in Basse, The Gambia,[11] US $1.14 in Jakisan, Ghana,[12] and US $1.24 in Tivouane in Senegal[25]. Since these are monthly costs, the extrapolated costs for four months would have been US $2.20, US $4.56 and US $4.96, respectively. The figures from Ghana and Senegal are comparable to the 2015 costs for ACCESS-SMC countries.

In addition, a study carried out by Malaria Consortium in Katsina State, Nigeria estimated the cost of SMC as US $3.98 per child for three complete cycles in 2013 and projected a cost of US $3.77 per child for four complete cycles if the program is fully mature in 2014.[13] An analysis by the Clinton Health Access Initiative (CHAI) of the costs of four months of SMC in Kano State, Nigeria, in 2013 estimated a total cost of US $6.10 per child for door-to-door distribution.[14] This is somewhat higher than ACCESS-SMC estimate of US $4.61 in Nigeria, partly because the costs of drugs and supplies as well as the costs for community sensitization seem to be higher in the Kano State project.

While it was not possible to cost and compare both the efficiency and effectiveness of some of the technologies or innovations used in 2015 by ACCESS-SMC, it is possible that they improved the efficiency of the program which may have reduced the costs. For example, the use of medicine grinders (i.e. pill crushers) in The Gambia may have reduced the time of SMC distributors and minimized the wastage of drugs. However, the use of medicine grinders may not be relevant in the future due to the introduction of dispersible SP+AQ tablets. Another example is the use of electronic tablets versus paper-based reporting in The Gambia, although evidence on the costs and cost-effectiveness of electronic data collection systems versus paper based system is not available.

The simplification of reporting tools (and expanded use of electronic tablets for data recording) and the increased awareness of the perceived effectiveness of SMC among target populations should increase the efficiency of distribution in the 2016 SMC round. Furthermore, the planned use of dispersible tablets in 2016 may also contribute to greater distribution efficiency.

Sufficient data were not available to conduct an analysis of the cost-effectiveness of the different service delivery methods; however, such a study is planned for 2017 (based on the 2016 SMC round).

[25] The cost for Senegal was derived in the Literature Review from figures quoted in the report by Pitt et al.

Limitations

There were a number of limitations which could have affected the results of this multi-country cost analysis:

- The samples of sub-national areas and health facilities[26] were relatively small and were selected based on ease of access and availability of staff for interview. The only original data collected through this sample was the estimated time spent by SMC distributors and direct supervisors. Data provided at the central level was confirmed among this sample, including personnel salaries and per diem payments received, numbers and types of training completed, and equipment used during SMC distribution.
- The attribution of MoH/NMCP staff salaries to ACCESS-SMC was based on estimates provided by the persons interviewed. In some cases, MoH salary scales were used to obtain an average salary for those involved in management and supervision; however, this is not likely to have significantly affected the results of the study. SMC coverage was measured as a percent of SMC administered relative to the estimated target population of ACCESS-SMC in each country. In many countries, these population estimates were not accurate and therefore this indicator may not be representative of program performance. Obtaining reliable baseline population estimates is essential for assessing true coverage and program performance. Any future comprehensive costing analysis would benefit from having accurate figures.
- LSHTM surveys provide estimates on the level of SMC coverage based on sample surveys. However, data were not provided on the total numbers of children who received the different numbers of SMC cycles.
- The costs per cycle cannot be translated into costs per child as the actual numbers of cycles received by an individual child were not captured.[27]
- The financial costs of managing severe adverse effects (SAE) of SMC drugs were not included in this analysis because these are integrated within the routine health care systems and there is variation in the maturity of SMC pharmacovigilance systems across the seven countries. In 2015, the numbers of children experiencing SAE from SMC were minimal (nine out of all children reached).[15] Additionally, treatment costs would likely depend on the severity of these cases (e.g. Steven Johnson's syndrome, a known SAE).

[27] Only in The Gambia were electronic beneficiary cards were used to retrieve such information; however, the equivalent number of children who received four cycles of SMC was calculate in the same way for all countries.

[27] Only in The Gambia were electronic beneficiary cards were used to retrieve such information; however, the equivalent number of children who received four cycles of SMC was calculate in the same way for all countries.

- Data on SMC wastage was not consistently reported among countries and therefore the costs pertaining to wastage were not included in this analysis but should be considered for inclusion in future costing studies as they may be significant.[28]
- This analysis focused on the costs of SMC and did not include economic costs such as the time of volunteers or the time and out-of-pocket costs of families spent accessing SMC at fixed or mobile service delivery points.
- The results also do not include the costs of international personnel of implementing NGO partners incurred for the initial start-up and design of ACCESS-SMC. They also do not include costs incurred by UNITAID personnel for oversight and coordination of ACCESS-SMC.
- At the time of writing this report, complete data from Chad were not available and were therefore not included in this analysis. An addendum including the Chad cost results may be included at a later time.
- The 2016 SMC country targets may be revised by MoHs and NMCPs which would affect the cost estimates included in the gap analyses (e.g. 2016 scale-up targets).

Recommendations

Based on this cross-country analysis, there are several lessons learned and suggestions for further operations research which would benefit the global learning on the implementation and scale-up of SMC.

Programmatic recommendations:

1) To be cost–effective and affordable, there must be high levels of SMC coverage among targeted populations. Moreover, SMC must be effectively and efficiently administered while program management and supervision should be organized to both minimize those costs while ensuring high-quality SMC provision.
2) To improve the sustainability of SMC, it will be essential to integrate SMC into government health services and to develop plans which ensure that governments take over key activities and related costs.
3) Information on the numbers of children who receive one, two, three, or four SMC cycles (and which cycles they received) should be routinely collected and reported on.

Recommendations for further research:

4) Studies are needed to determine the cost–effectiveness of various SMC delivery mechanisms (e.g. door-to-door, fixed point, and mobile distribution) in each setting and the integration of SMC with other health services. This study should take into account the economic costs incurred by volunteer distributors and by

[28] It is expected that with the introduction of dispersible tablets, wastage will significantly reduce and therefore this suggested research may not be relevant.

families of beneficiaries, including productivity losses and out-of-pocket costs for accessing SMC.

5) A study on the feasibility of SMC integration into government services would help to facilitate its long-term sustainability.
6) Data should be collected on the utilization of health facility and community malaria treatment services to identify any impact from SMC on malaria service utilization.
7) A cost-benefit analysis comparing SMC with other malaria interventions would assist decision-makers to effectively allocate financial resources based upon evidence.

Conclusions

The distribution of SMC in the Sahel sub-region of Africa has the potential to prevent millions of malaria cases and avert thousands of malaria deaths annually among children under-five.[16] Although proven safe, effective, and feasible, there has been limited documented evidence on the costs of delivering SMC in various country contexts. Consequently, countries and donors lack evidence-based information to make sound investment cases for mobilizing additional financial resources for future SMC implementation and scale-up.

In 2015 ACCESS-SMC SMC administered four SMC cycles to an equivalent of 3.12 million children[29] (3-59 months) during the peak four months of malaria transmission in seven countries in the Sahel. The unweighted average equivalent recurrent cost per cycle of treatment was US $1.16 or US $4.63 for four cycles. The weighted average equivalent recurrent cost per child (3-59 months) for four SMC cycles was US $1.07 per cycle or US $4.27.[30] The cost per cycle and per round of four cycles ranged from US $0.87 and US $3.48, respectively, in Niger to US $1.65 and US $6.58, respectively, in The Gambia. This is likely to be a low cost compared to the expected health benefits for both the child and the family as well as the related reduction of burden to national health systems.

However, there remains a significant unmet need for SMC in 2016, notably in Nigeria and Niger where an estimated 9.5 million and 1.6 million eligible children (3-59 months) will not receive SMC, respectively, based on 2016 targets. Significant additional funding would be needed to provide SMC to these children.

The total costs of SMC program implementation include the important contributions of the international NGO partners in each country. With the integration of SMC into the

[29] This figure is calculated by dividing the total number of cycles by four cycles and does not represent the actual number of children who received four cycles. The coverage survey conducted by LSHTM indicates that many of the children received fewer than four cycles, meaning that more children were reached in total but some received three cycles or less.

[30] This figure is proportionately weighted according to the equivalent number of children who received four monthly cycles (3-59 months) in each country.

government health services provided in these countries, SMC should be more affordable and sustainable.

Annexes

The following annexes are individual country reports which provide additional details on ACCESS-SMC in each of the seven countries. These are followed by a list of references.

Annex 1 - Burkina Faso

From July to November 2015,[31] ACCESS-SMC, managed by Malaria Consortium in partnership with the National Malaria Control Program, supported the distribution of SMC in 11 districts in three regions of Burkina Faso,[32] targeting an estimated 649,693 children (3-59 months). Each of the four SMC distribution cycles lasted four days.

A combination of 6,500 trained community distributors and 355 health facility staff (e.g. nurses and midwives) administered SMC by way of two distribution methods: door-to-door (two-person teams) and at fixed points located at health centers (one-person teams) which were in place to serve primarily as referral centers for sick children and provide SMC to children who were came to the facility. It was estimated that 90% of SMC was distributed by door-to-door teams and 10% was distributed at fixed points. To ensure the acceptability of SMC and high rates of coverage within communities, 3,483 trained community mobilizers sensitized communities on the benefits of SMC prior to and during each distribution cycle.

Trained staff at the health facility, district, regional, and national levels conducted regular supervision of the SMC distributors throughout the round to monitor the quality of SMC drug administration and data reporting while ensuring distributors had available stock of SMC.

Table 11. ACCESS-SMC geographic and population coverage - Burkina Faso (2015)

	Burkina Faso
Year of SMC commencement in-country	2013
Months of ACCESS-SMC distribution	July – November 2015
Number of distribution cycles per round	4
Number of days per SMC distribution cycle	4 days
Geographic coverage	11 districts in 3 regions
SMC distribution method(s)	Door-to-door & fixed point
Number of SMC distributors	6,855 (6,500 volunteers & 355 health facility staff)
Number of direct supervisors of SMC distributors	671
Target population (3-59 months)	649,693
Target population (3- <12 months)	96,607
Target population (>12-59 months)	553,086
Ratio of target population per distributor	95

By the end of the round, a total of 2,721,731 SMC cycles had been administered, resulting in an equivalent of 680,433 children (3-59 months) reached in four cycles,[33] which

[31] The first cycle began on July 31, 2015.

[32] The ACCESS-SMC project implemented the project in three regions: Centre Nord, Est, Plateau Central and eleven districts: Barsalogho, Boulsa, Kaya, Bogande, Diapaga, Fada, Gayeri, Manni, Pama, Ziniare, and Zorgho.

[33] This figure is calculated by dividing the total number of cycles by four cycles and does not represent the actual number of children who received four complete cycles of SMC as it is estimated that some children did not receive all four cycles. The coverage survey conducted by LSHTM indicates that many of the children received fewer than four cycles, meaning that more children were reached in total but some received three cycles or less.

represented a coverage rate of 104.73%.[34] From the first to the fourth cycle, the number of SMC administered increased from 648,290 to 702,379.

Coverage surveys that were later conducted by LSHTM indicate that around 84% of eligible children received at least three cycles of SMC and 69% received all four cycles, with the remainder each receiving two cycles or less. This presumably shows that more children were reached than the coverage rate indicates but that many of them received less than the recommended four cycles.

Table 12. ACCESS-SMC coverage - Burkina Faso (2015)

	Burkina Faso
Total number of SMC cycles administered	2,721,731
Equivalent number of children who received four monthly cycles (3-59 months) [a]	680,433
Percent coverage of target (3-59 months)	104.73%
Equivalent number of children who received four monthly cycles (3 up to 12 months) [a]	94,556
Percent coverage (3 up to 12 months)	97.88%
Equivalent number of children who received four monthly cycles (>12-59 months) [a]	585,877
Percent coverage (>12-59 months)	105.93%
2015 SMC round results (children 3-59 months)	
Cycle 1	648,290
Cycle 2	672,185
Cycle 3	698,877
Cycle 4	702,379
Percent of children (3-59 months) receiving four full cycles of SMC, based on LSHTM coverage survey	69.2%

[a] *This figure is calculated by dividing the total number of SMC cycles administered by four cycles and does not represent the actual number of children who received four cycles.*

The estimated 2015 total program costs were US $2,808,875, comprised of start-up costs (i.e. those incurred at the beginning of the program) and recurrent costs (i.e. those that are repeated ever year) (Table 13). Start-up costs amounted to US $136,989 and included the costs of the initial launch meetings, planning meetings, the adaptation of job aids and training manuals, among other one-time activities. The recurrent costs totaled US $2,671,886 and included the costs of SMC distributor remuneration, ongoing activities (e.g. meetings, training, supervision visits, etc.) and purchases (e.g. drugs, equipment, reporting tools, etc.). The average equivalent recurrent cost per child (3-59 months) for four cycles of SMC in 2015 was US $3.93.

[34] SMC coverage higher than 100% could be due to two factors: 1) an initial underestimation of the target population; 2) children from outside the intervention area received SP+AQ; 3) children outside of the targeted age group receiving SMC

Table 13. Total program costs and cost for one and four SMC cycles – Burkina Faso (2015, US $)

	Burkina Faso
Total program costs	$2,808,875
Total recurrent costs	$2,671,886
Total start-up costs	$136,989
Average equivalent recurrent cost per child (3-59 months) for four SMC cycles [a]	$3.93
Average equivalent recurrent cost per cycle (3-59 months)	$0.98

[a] *This figure is based on the equivalent number of children (3-59 months) who received four SMC cycles.*

The majority of the recurrent costs was for drugs and supplies (37.43%), remuneration of SMC distributors (22.60%), and management (13.20%) in the form of MoH/NMCP and Malaria Consortium staff salaries.

Table 14. Recurrent costs and average equivalent recurrent cost per child (3-59 months) for four cycles of SMC – Burkina Faso (2015, US $)

Cost categories	Recurrent costs	Percent of recurrent costs	Average equivalent recurrent cost per child reached for four cycles
Drugs and supplies	$1,000,101	37.43%	$1.47
Remuneration of SMC distributors	$603,904	22.60%	$0.89
Management	$352,709	13.20%	$0.52
Supervision	$161,864	6.06%	$0.24
Meetings	$210,639	7.88%	$0.31
Training - recurrent	$136,287	5.10%	$0.20
Other recurrent program costs	$206,381	7.72%	$0.30
Total	$2,671,886	100%	$3.93

UNITAID financed 95.45% of the total recurrent costs of ACCESS-SMC activities and the MoH financed 4.55% or the total recurrent costs. The MoH portion was made up of 13% of SMC distributor remuneration (in the form of MoH staff salaries for health center distributors) and 12.9% of management costs (i.e. MoH salaries for support personnel).

Table 15. Financing of ACCESS-SMC - recurrent costs – Burkina Faso (2015, US $)

	Burkina Faso
Total recurrent costs	$2,671,886
UNITAID contributions	$2,550,391
Percent of total recurrent costs	95.45%
Government contributions	$121,494
Percent of total recurrent costs	4.55%
Other contributions	$0
Percent of total recurrent costs	0.00%

On average, each SMC distributor administered SMC to 25 children per day. The average ratio of SMC distributors to direct supervisors was approximately 10:1. The estimated wastage rate of SP+AQ administered was 0.94%.[35]

Table 16. SMC distribution efficiency – Burkina Faso (2015)

Efficiency indicators	Burkina Faso
Total SMC administered by distributors (including the wastage of drugs)	2,747,443
Total SMC effectively administered by distributors (excluding wastage)	2,721,731
Total wastage of SMC	25,712
Wastage as percent of total SMC distributed	0.94%
Equivalent number of children (3-59 months) who received four cycles of SMC [a]	680,433
Actual SMC treatments provided per distributor per day	25
Actual ratio of distributors per direct supervisors	10:1

a This figure is calculated by dividing the total number of SMC cycles administered by four cycles and does not represent the actual number of children who received four cycles.

In 2015, ACCESS-SMC reached an equivalent of 680,433 children (3-59 months) with four cycles of SMC while other implementing partners reached an estimated 273,614 children (3-59 months) with four cycles of SMC. Based on the 2015 ACCESS-SMC project recurrent cost estimates, the required cost of reaching the 1,549,890 eligible children who remained with unmet need would have been approximately US $6.1 million.[36]

[35] This figure does not account for wastage of AQ provided by caregivers of children.
[36] Plus any additional start-up costs required.

Table 17. Unmet gap of SMC coverage and costs – Burkina Faso (2015, US $)

2015 coverage and cost indicators	Burkina Faso
Children (3-59 months) eligible for SMC	2,503,937
Equivalent number of children (3-59 months) who received four SMC cycles through ACCESS-SMC [a]	680,433
Equivalent number of children (3-59 months) who received four SMC cycles by other implementing partners [a]	273,614
Equivalent number of children (3-59 months) who received four SMC cycles by all implementing partners (including ACCESS-SMC) [a]	954,047
Percent of all eligible children (3-59 months) reached by ACCESS-SMC	27.17%
Percent of eligible children (3-59 months) reached by all implementing partners (including ACCESS-SMC) [b]	38.10%
2015 gap analysis	
Eligible children (3-59 months) with unmet need for SMC	1,549,890
Average number of children not reached by ACCESS-SMC in targeted districts [c]	0
Percent of eligible children with unmet need for SMC [d]	61.90%
Cost of reaching additional children with unmet need	$6.1 million

[a] *This figure is calculated by dividing the total number of SMC drugs administered by four months and does not represent the actual number of children who received four cycles.*
[b] *More children were reached but not all of them received the full four cycles.*
[c] *The number of cycles administered was higher than the target and so this number is showed as zero, reaching 30,740 children beyond the initial target population.*
[d] *Some of the children included under unmet need received at least one cycle of SMC but not all four cycles.*

According to data from the Burkina Faso NMCP, ACCESS-SMC plans to target 1,394,653 children (3-59 months) for SMC distribution in 2016 while other implementing partners plan to target 1,181,414 children (3-59 months), covering 100% of all eligible children. Based on the average equivalent recurrent cost per child (3-59 months) for four cycles of SMC in 2015, and assuming that no additional start-up costs would be needed and no additional economies of scale would be achieved, the cost of reaching the children targeted by all providers would be approximately US $10.1 million (excluding inflation).

Table 18. Unmet gap of SMC coverage and costs – Burkina Faso (2016, US $)

2016 coverage and cost indicators	Burkina Faso
Children (3-59 months) eligible for SMC	2,576,067
Children (3-59 months) targeted by ACCESS-SMC	1,394,653
Children (3-59 months) targeted by other implementing partners	1,181,414
Children (3-59 months) targeted by all implementing partners	2,576,067
Percent of all eligible children (3-59 months) targeted for SMC by ACCESS-SMC	54.14%
2016 gap analysis	
Children (3-59 months) with unmet need for SMC	0
Cost of reaching children targeted for SMC by all implementing partners (using 2015 unit costs)	$10,115,554
Cost of reaching children with unmet need (using 2015 unit costs)	$0

Annex 2 - Chad

From July to October 2015, ACCESS-SMC (implemented by Malaria Consortium in partnership with the Chadian National Malaria Control Program) and the Centre de Support en Santé Internationale) supported the distribution of SMC in six districts in two regions of Chad,[37] targeting an estimated 275,000 children (3-59 months). Each of the four SMC distribution cycles lasted four days.

During the first three cycles, 2,120 trained volunteer distributors were deployed; however, for the fourth cycle, the number of distributors decreased to 1,987 (i.e. the average number of distributors was 2,087 for the four cycles). All distributors delivered SMC through a door-to-door distribution method. A total of 460 trained community mobilizers sensitized communities on the benefits of SMC prior to and during each distribution cycle.

Trained personnel at all levels of the health system conducted regular supervision of the SMC distributors throughout the round to monitor the quality of SMC administration and data reporting while ensuring distributors had available stock of SMC. These included 299 trained volunteer supervisors, 92 health center supervisors, and teams of supervisors at the district, regional, and national levels.

Table 19. ACCESS-SMC geographic and population coverage - Chad (2015)

	Chad
Year of SMC commencement in-country	2012
Months of ACCESS-SMC distribution	July - October 2015
Number of distribution cycles per round	4
Number of days per SMC distribution cycle	4 days
Geographic coverage	6 districts in 2 regions
SMC distribution method(s)	Door-to-door
Number of SMC distributors	2,087
Number of direct supervisors of SMC distributors	299
Target population (3-59 months)	275,000
Target population (3- <12 months)	63,250
Target population (>12-59 months)	211,750
Ratio of target population per distributor	132:1

By the end of the 2015 round, a total of 1,061,417 SMC had been administered; resulting in an equivalent of 265,354 children (3 -59 months) reached[38] which represented a coverage rate of 96.49% (Table 20). From the first to the fourth cycle, the number of SMC drugs administered per cycle increased from 250,233 to 272,381.

[37] The ACCESS-SMC project distributed SMC in two regions: Chari-Baguirmi and Hadjer-Lamis and six districts: Massenya, Dourbali, Mandelia, Massakory, Massaguet, and Mani.

[38] This figure is calculated by dividing the total number of cycles by four cycles and does not represent the actual number of children who received four complete cycles of SMC as it is estimated that some children did not receive all four cycles. The coverage survey conducted by LSHTM indicates that many of the children received fewer than four cycles, meaning that more children were reached in total but some received three cycles or less.

Coverage surveys conducted by LSHTM indicate that 82% of children (3-59 months) received an SMC card (were reached) and approximately 60% of eligible children received at least three cycles while only 22.7% of the children (3-59 months) received the full four cycles. This presumably demonstrates that more children were reached than the coverage rate indicates but that many of them received less than the recommended four cycles.

Table 20. ACCESS-SMC coverage - Chad (2015)

	Chad
Total number of SMC cycles administered	1,061,417
Equivalent number of children who received four monthly cycles (3-59 months) [a]	265,354
Percent coverage (3-59 months)	96.49%
Equivalent number of children who received four monthly cycles (3- <12 months) [a]	46,743
Percent coverage (3- <12 months)	73.90%
Equivalent number of children who received four monthly cycles (>12-59 months) [a]	218,612
Percent coverage (>12-59 months)	103.24%
2015 SMC round results (children 3-59 months)	
Cycle 1	250,233
Cycle 2	268,286
Cycle 3	270,517
Cycle 4	272,381
Percent of children (3-59 months) receiving four full cycles of SMC, based on LSHTM coverage survey	22.7%

[a] *This figure is calculated by dividing the total number of SMC cycles administered by four cycles and does not represent the actual number of children who received four cycles.*

The estimated 2015 total program costs were US $1,280,489, comprised of start-up costs (i.e. those incurred at the beginning of the program) and recurrent costs (i.e. those that are repeated ever year).[39] Start-up costs amounted to US $49,649 and included the costs of conducting an initial census, an initial launch meeting, and an initial training for expert trainers. The recurrent costs totaled US $1,230,840 and included the costs of SMC distributor remuneration, ongoing activities (e.g. meetings, training, supervision visits, etc.) and purchases (e.g. drugs, equipment, reporting tools, etc.).

Table 21. Total program costs and cost for one and four SMC cycles - Chad (2015, US $)

	Chad
Total program costs	$1,280,489
Total recurrent costs	$1,230,840
Total start-up costs	$49,649
Average equivalent recurrent cost per child (3-59 months) for four SMC cycles [a]	$4.64
Average equivalent recurrent cost per cycle (3-59 months)	$1.16

[a] *This figure is based on the equivalent number of children (3-59 months) who received four SMC cycles.*

[39] The following exchange rate was used for this analysis: 1 USD is equivalent to 591 Central African CFA.

The average equivalent recurrent cost per child (3-59 months) for four cycles of SMC in 2015 was US $4.64. The majority of the recurrent costs was for supervision (31.58%), drugs and supplies (28.87%), remuneration of SMC distributors (13.77%), and management (9%) in the form of staff salaries for personnel from Malaria Consortium, MoH/NMCP, and the Centre de Support en Santé Internationale.

Table 22. Recurrent costs and average equivalent recurrent cost per child reached for four SMC cycles – Chad (2015, US $)

Cost categories	Recurrent costs	Percent of recurrent costs	Average equivalent recurrent cost per child for four SMC cycles (3-59 months)
Drugs and supplies	$355,291	28.87%	$1.34
Remuneration of SMC distributors	$169,482	13.77%	$0.64
Management	$115,976	9.42%	$0.44
Supervision	$388,662	31.58%	$1.46
Meetings	$33,433	2.72%	$0.13
Training - recurrent	$83,399	6.78%	$0.31
Other recurrent program costs	$84,597	6.87%	$0.32
Total	$1,230,840	100%	$4.64

UNITAID financed 98.88% of the total recurrent costs of ACCESS-SMC activities and the MoH financed 1.12 percent or the total recurrent costs, including 13.02% of total management costs (i.e. MoH salaries).

Table 23. Financing of ACCESS-SMC - recurrent costs – Chad (2015, US $)

	Chad
Total recurrent costs	$1,230,840
UNITAID contributions	$1,217,089
Percent of total recurrent costs	98.88%
Government contributions	$13,751
Percent of total recurrent costs	1.12%
Other contributions	$0
Percent of total recurrent costs	0.00%

On average, each SMC distributor administered SMC to 32 children per day. The average ratio of SMC distributors to direct supervisors was approximately 7:1. The estimated wastage rate of SP+AQ was 0.40%.

Table 24. SMC distribution efficiency – Chad (2015)

Efficiency indicators	Chad
Total SMC administered by distributors (including the wastage of drugs)	1,065,674
Total SMC effectively administered by distributors (excluding wastage)	1,061,417
Total wastage of SMC	4,257
Wastage as percent of total SMC distributed	0.40%
Equivalent number of children (3-59 months) who received four cycles of SMC [a]	265,354
Actual SMC treatments provided per distributor per day	32
Actual ratio of distributors per direct supervisors	7:1

a This figure is calculated by dividing the total number of SMC cycles administered by four cycles and does not represent the actual number of children who received four cycles.

In 2015, ACCESS-SMC reached an equivalent of 680,433 children (3-59 months) with four cycles of SMC while other implementing reportedly reached an equivalent of 168,969 children (3-59 months) with four cycles of SMC.[40] Based on the 2015 ACCESS-SMC project recurrent cost estimates, the required cost of reaching the 1,056,309 eligible children who remained with unmet need for SMC would have been approximately US $ 4.9 million.

Table 25. Unmet gap of SMC coverage and costs – Chad (2015, US $)

2015 coverage and cost indicators	Chad
Children (3-59 months) eligible for SMC	1,490,632
Equivalent number of children (3-59 months) who received four SMC cycles through ACCESS-SMC [a]	265,354
Equivalent number of children (3-59 months) who received four SMC cycles by other implementing partners [a]	168,969
Equivalent number of children (3-59 months) who received four SMC cycles by all implementing partners (including ACCESS-SMC) [a]	434,324
Percent of all eligible children (3-59 months) reached by ACCESS-SMC	17.80%
Percent of eligible children (3-59 months) reached by all implementing partners (including ACCESS-SMC) [b]	29.14%
2015 gap analysis	
Eligible children (3-59 months) with unmet need for SMC	1,056,309
Average number of children not reached by ACCESS-SMC in targeted districts [c]	9,646
Percent of eligible children with unmet need for SMC [d]	70.86%
Cost of reaching additional children with unmet need	$4,899,664

[a] This figure is calculated by dividing the total number of SMC drugs administered by four months and does not represent the actual number of children who received four cycles.
[b] More children were reached but not all of them received the full four cycles.
[c] The number of cycles administered was higher than the target and so this number is showed as zero.
[d] Some of the children included under unmet need received at least one cycle of SMC but not all four cycles.

[40] Not all SMC partners report the total of number of children for all four cycles. This figure is calculated by dividing the total number of SMC drugs administered by four months and does not represent the actual number of children who received four cycles.

According to data from the Chadian NMCP, ACCESS-SMC plans to target 518,656 children (3-59 months) for SMC distribution in 2016 while other implementing partners plan to target 411,948 children (3-59 months), covering 60.26% of all eligible children (3-59 months). ACCESS-SMC plans to cover 33.59 percent of all eligible children (3-59 months) in Chad.

The cost of reaching all children (3-59 months) targeted by all implementing partners would be approximately US $4.32 million (excluding inflation) and the cost of reaching the additional children (3-59 months) with unmet need would be an estimated US $2.85 million (excluding inflation). These figures are based on the average equivalent recurrent cost per child (3-59 months) for four cycles of SMC in 2015, and assuming that no additional start-up costs would be needed and no additional economies of scale would be achieved.

Table 26. Unmet gap of SMC coverage and costs – Chad (2016, US $)

2016 coverage and cost indicators	Chad
Children (3-59 months) eligible for SMC	1,544,295
Children (3-59 months) targeted by ACCESS-SMC	518,656
Children (3-59 months) targeted by other implementing partners	411,948
Children (3-59 months) targeted by all implementing partners	930,604
Percent of all eligible children (3-59 months) targeted for SMC by ACCESS-SMC	33.59%
2016 gap analysis	
Children (3-59 months) with unmet need for SMC	613,691
Cost of reaching children targeted for SMC by all implementing partners (using 2015 unit costs)	$4,316,587
Cost of reaching children with unmet need (using 2015 unit costs)	$2,846,593

Annex 3 - Guinea

From July to October 2015, ACCESS-SMC (implemented by CRS in partnership with Guinean NMCP and Speak Up Africa) supported the distribution of SMC in six districts in three regions of Guinea,[41] targeting an estimated 210,047 children (3-59 months).

The first cycle of SMC distribution lasted three days but was deemed insufficient to cover the number of targeted children (3-59 months) and therefore, the remaining three cycles were extended to four days each. During the first cycle, 1,084 trained volunteer distributors were deployed; however, to improve coverage, the number of distributors was increased to 1,261 during the remaining three cycles (1,217 represents an average number of distributors over the four cycles).

To ensure the acceptability of SMC and high rates of coverage within communities, 104 trained community mobilizers sensitized communities on the benefits of SMC prior to and during each distribution cycle. In addition, ACCESS-SMC supported the airing of educational radio spots prior to and during each distribution cycle.

Trained staff at the health facility, district, regional, and national levels conducted regular supervision of the SMC distributors throughout the round to monitor the quality of distribution and data reporting while ensuring distributors had available stock of SMC.

Table 27. ACCESS-SMC geographic and population coverage - Guinea (2015)

	Guinea
Year of SMC commencement in-country	2015
Months of ACCESS-SMC distribution	July - October 2015
Number of distribution cycles per round	4
Number of days per SMC distribution cycle	4 days (Cycle 1 lasted 3 days)
Geographic coverage	6 districts in 3 regions
SMC distribution method(s)	Door-to-door
Number of SMC distributors	1,217
Number of direct supervisors of SMC distributors	156
Target population (3-59 months)	210,047
Target population (3- <12 months)	42,023
Target population (>12-59 months)	168,084
Ratio of target population per distributor	173:1

By the end of the round, a total of 805,131 SMC drugs had been administered, resulting in an equivalent of 201,283 children (3-59 months) reached[42] which represented a coverage

[41] The ACCESS-SMC project distributed SMC in three regions: Boké, Labé, Faranah and six districts: Koubia, Mali, Tougue, Gaoual, Koundara, and Dinguiraye.

[42] This figure is calculated by dividing the total number of cycles by four cycles and does not represent the actual number of children who received four complete cycles of SMC as it is estimated that some children did not receive all four cycles. The coverage survey conducted by LSHTM indicates that many of the children received fewer than four cycles, meaning that more children were reached in total but some received three cycles or less.

rate of 95.83%. From the first to the fourth cycle, the number of estimated children (3-59 months) reached increased from 174,448 to 210,448.

Table 28. ACCESS-SMC coverage - Guinea (2015)

	Guinea
Total number of SMC cycles administered	805,131
Equivalent number of children who received four monthly cycles (3-59 months) [a]	201,283
Percent coverage (3-59 months)	95.83%
Equivalent number of children who received four monthly cycles (3- <12 months) [a]	42,715
Percent coverage (3- <12 months)	101.65%
Equivalent number of children who received four monthly cycles (>12-59 months) [a]	158,563
Percent coverage (>12-59 months)	94.34%
2015 SMC round results (children 3-59 months)	
Cycle 1	174,448
Cycle 2	211,997
Cycle 3	208,238
Cycle 4	210,448
Percent of children (3-59 months) receiving four full cycles of SMC, based on LSHTM coverage survey	53.6%

[a] *This figure is calculated by dividing the total number of SMC cycles administered by four cycles and does not represent the actual number of children who received four cycles.*

The estimated 2015 total program costs were US $1,082,096, comprised of start-up costs (i.e. those incurred at the beginning of the program) and recurrent costs (i.e. those that are repeated ever year). Start-up costs amounted to US $49,947 and included costs of the initial launch meetings in Conakry and in districts, the production of videos and radio spots, the removal of artesunate/amodiaquine (ASAQ) in intervention zone health facilities,[43] among other one-time activities. The recurrent costs totaled US $1,032,149 and included the costs of ongoing activities (e.g. meetings, training, supervision visits, etc.) and purchases (e.g. drugs, equipment, etc.).

Table 29. Total program costs and cost for one and four SMC cycles - Guinea (2015, US $)

	Guinea
Total program costs	$1,082,096
Total recurrent costs	$1,032,149
Total start-up costs	$49,947
Average equivalent recurrent cost per child (3-59 months) for four SMC cycles [a]	$5.13
Average equivalent recurrent cost per cycle (3-59 months)	$1.28

[a] *This figure is based on the equivalent number of children (3-59 months) who received four SMC cycles.*

[43] The USAID Systems for Improved Access to Pharmaceuticals and Services (SIAPS) program, led by Management Sciences for Health, replaced remaining artesunate/amodiaquine (ASAQ) with artemether-lumefantrine (AL) at health facilities in SMC intervention districts due to potential pharmacovigilance issues.

The average equivalent recurrent cost per child (3-59 months) for four cycles of SMC in 2015 was US $5.13. The highest recurrent cost elements were for drugs and supplies (29.59%), supervision (19.69%), and management (16.41%).

Table 30. Recurrent costs and average equivalent recurrent cost per child (3-59 months) for four cycles of SMC – Guinea (2015, US $)

Cost categories	Recurrent costs	Percent of recurrent costs	Average equivalent recurrent cost per child for four SMC cycles (3-59 months)
Drugs and supplies	$305,396	29.59%	$1.52
Remuneration of SMC distributors	$118,019	11.43%	$0.59
Management	$169,355	16.41%	$0.84
Supervision	$203,185	19.69%	$1.01
Meetings	$21,945	2.13%	$0.11
Training – recurrent	$36,304	3.52%	$0.18
Other recurrent program costs	$177,946	17.24%	$0.88
Total	$1,032,149	100%	$5.13

Of the total recurrent costs, 94.38% were financed by UNITAID and 5.62% by the MoH. The MoH contributed 34% of management costs. The MoH figure is based on the reported average time spent and salaries of NMCP/MoH staff involved in supporting the program at all levels of the health system. Management costs financed by UNITAID comprised salaries paid to CRS and Speak Up Africa as well as top-up payments paid to NMCP/MoH staff.

Table 31. Financing of ACCESS-SMC - recurrent costs – Guinea (2015, US $)

	Guinea
Total recurrent costs	$1,032,149
UNITAID contributions	$974,118
Percent of total recurrent costs	94.38%
Government contributions	$58,031
Percent of total recurrent costs	5.62%
Other contributions	$0
Percent of total recurrent costs	0.00%

On average, each SMC distributor administered SMC to 44 children per day. The average ratio of SMC distributors to direct supervisors was approximately 8:1. It was estimated that the wastage rate of SP+AQ administered was 0.85%.[44]

[44] This figure does not account for wastage of AQ provided by caregivers of children.

Table 32. SMC distribution efficiency – Guinea (2015)

Efficiency indicators	Guinea
Total SMC administered by distributors (including the wastage of drugs)	812,021
Total SMC effectively administered by distributors (excluding wastage)	805,131
Total wastage of SMC	6,890
Wastage as percent of total SMC distributed	0.85%
Equivalent number of children (3-59 months) who received four cycles of SMC [a]	201,283
Actual SMC treatments provided per distributor per day	44
Actual ratio of distributors per direct supervisors	8:1

a This figure is calculated by dividing the total number of SMC cycles administered by four cycles and does not represent the actual number of children who received four cycles.

In 2015, ACCESS-SMC reached an equivalent of 680,433 children (3-59 months) with four cycles of SMC ; no other implementing partners distributed SMC in Guinea in 2015. Based on the 2015 ACCESS-SMC project recurrent cost estimates, the estimated cost of reaching the remaining 214,339 eligible children with unmet need would have been approximately US $1.1 million. This is based on the average equivalent recurrent cost per child (3-59 months) for four cycles of SMC in 2015 and assumed that no further start-up costs would be needed.

Table 33. Unmet gap of SMC coverage and costs – Guinea (2015, US $)

2015 coverage and cost indicators	Guinea
Children (3-59 months) eligible for SMC	415,622
Equivalent number of children (3-59 months) who received four SMC cycles through ACCESS-SMC [a]	201,283
Equivalent number of children (3-59 months) who received four SMC cycles by other implementing partners [a]	0
Equivalent number of children (3-59 months) who received four SMC cycles by all implementing partners (including ACCESS-SMC) [a]	201,283
Percent of all eligible children (3-59 months) reached by ACCESS-SMC	48.43%
Percent of eligible children (3-59 months) reached by all implementing partners (including ACCESS-SMC) [b]	48.43%
2015 gap analysis	
Eligible children (3-59 months) with unmet need for SMC	214,339
Average number of children not reached by ACCESS-SMC in targeted districts	8,764
Percent of eligible children with unmet need for SMC [c]	51.57%
Cost of reaching additional children with unmet need	$1,099,098

[a] *This figure is calculated by dividing the total number of SMC drugs administered by four months and does not represent the actual number of children who received four cycles.*
[b] *More children were reached but not all of them received the full four cycles.*
[c] *Some of the children included under unmet need received at least one cycle of SMC but not all four cycles.*

In 2016, ACCESS-SMC intends to expand SMC coverage to eight districts[45] in four regions, targeting an estimated 438,123 children (3-59 months). The estimated cost of reaching children targeted for SMC (2016) is US $2.2 million. This is based on the average equivalent recurrent cost per child (3-59 months) for four cycles of SMC in 2015 and assumed that no additional start-up costs would be needed (excluding inflation).

Table 34. Unmet gap of SMC coverage and costs – Guinea (2016, US $)

2016 coverage and cost indicators	Guinea
Children (3-59 months) eligible for SMC	438,123
Children (3-59 months) targeted by ACCESS-SMC	438,123
Children (3-59 months) targeted by other implementing partners	0
Children (3-59 months) targeted by all implementing partners	438,123
Percent of all eligible children (3-59 months) targeted for SMC by ACCESS-SMC	100.00%
2016 gap analysis	
Children (3-59 months) with unmet need for SMC	0
Cost of reaching children targeted for SMC by all implementing partners (using 2015 unit costs)	$2,246,629
Cost of reaching children with unmet need (using 2015 unit costs)	$0

[45] Districts include: Gaoual, Koundara, Mali, Koubia, Tougué, Dinguiraye, Siguiri, and Mandiana.

Annex 4 - Mali

From August to November 2015, ACCESS-SMC (implemented by CRS in partnership with Mali National Malaria Control Program and Speak Up Africa) supported the distribution of SMC in 14 districts in five regions of Mali,[46] targeting an estimated 809,638 children (3-59 months). Each of the four SMC distribution cycles lasted five days.

A total of 4,606 trained personnel (volunteers and MoH health workers) administered SMC by way of two methods: mobile distribution in villages (658 teams of four people) and at fixed points located at health facilities (329 teams of six-people). The majority of distributors were salaried MoH personnel. It was estimated that 31% of SMC was distributed by mobile teams and 69% of SMC was distributed at fixed points; however, data confirming this estimate was unavailable. SMC distributors also reported using RDTs to test febrile children for malaria and providing referrals to the health facility for those who tested positive for malaria.

To ensure the acceptability of SMC and high rates of coverage within communities, 3,483 trained community mobilizers sensitized communities on the benefits of SMC prior to and during each distribution cycle.

Trained staff at the health center, district, regional, and national levels conducted regular supervision of the SMC distributors throughout the round to monitor the quality of distribution and data reporting while ensuring distributors had available stock of SMC.

Table 35. ACCESS-SMC geographic and population coverage - Mali (2015)

	Mali
Year of SMC commencement in-country	2012
Months of ACCESS-SMC distribution	August – November 2015
Number of distribution cycles per round	4
Number of days per SMC distribution cycle	5 days
Geographic coverage	14 districts in 5 regions
SMC distribution method(s)	Fixed point & mobile
Number of SMC distributors	4,606
Number of direct supervisors of SMC distributors	658
Target population (3-59 months)	809,638
Target population (3- <12 months)	141,353
Target population (>12-59 months)	668,285
Ratio of target population per distributor	176:1

By the end of the 2015 round, a total of 2,751,353 cycles of SMC had been administered, resulting in an equivalent of 687,838 children (3–59 months) reached,[47] which

[46] The ACCESS-SMC project supported SMC distribution in five regions: Kayes, Koulikoro, Sikasso, Segou, and Mopti and 14 districts: Diema, Nioro, Koulikoro, Nara, Bougouni, Kadiolo, Yanfolila, Baraoueli, Macina, Niono, Tominian, Markala, Djenne, Douentza.

[47] This figure is calculated by dividing the total number of cycles by four cycles and does not represent the actual number of children who received four complete cycles of SMC as it is estimated that some children did not receive all four cycles. The coverage survey conducted by LSHTM indicates that many of the children

represented a coverage rate of 84.96%. From the first to the second cycle, the number of children (3-59 months) reached increased from 691,231 to 711,973; however, the number of children (3-59 months) reached declined to 687,709 in the third cycle and to 660,440 in the fourth cycle.

Coverage surveys that were later conducted by LSHTM indicate that the reach of the SMC program in Mali has been good, with 86% of children having received an SMC card and at least one cycle of SMC; around 56% of eligible children received at least three cycles of SMC, 38% received all 4 cycles. Coverage of the first cycle appears to be highest at around 70%, with coverage at the final cycle in November having the lowest coverage at 50%. This implies that most children here received three cycles or less. This presumably shows that more children were reached than the coverage rate indicates but that many of them received less than the recommended four cycles.

Table 36. ACCESS-SMC coverage - Mali (2015)

	Mali
Total number of SMC cycles administered	2,751,353
Equivalent number of children who received four monthly cycles (3-59 months) [a]	687,838
Percent coverage (3-59 months)	84.96%
Equivalent number of children who received four monthly cycles (3- <12 months) [a]	132,635
Percent coverage (3- <12 months)	93.83%
Equivalent number of children who received four monthly cycles (>12-59 months) [a]	555,203
Percent coverage (>12-59 months)	83.08%
2015 SMC round results (children 3-59 months)	
Cycle 1	691,231
Cycle 2	711,973
Cycle 3	687,709
Cycle 4	660,440
Percent of children (3-59 months) receiving four full cycles of SMC, based on LSHTM coverage survey	37.7%

[a] *This figure is calculated by dividing the total number of SMC cycles administered by four cycles and does not represent the actual number of children who received four cycles.*

The estimated 2015 total program costs were US $2,846,692, comprised of start-up costs (i.e. those incurred at the beginning of the program) and recurrent costs (i.e. those that are repeated ever year). Start-up costs amounted to US $60,081 and included costs of the initial launch meetings in and in districts, the production of videos and radio spots, among other one-time activities. The recurrent costs totaled US $2,786,611 and included the costs SMC distributor remuneration, ongoing activities (e.g. meetings, training, supervision visits, etc.), and purchases (e.g. drugs, equipment, etc.).

received fewer than four cycles, meaning that more children were reached in total but some received three cycles or less.

Table 37. Total program costs and cost for one and four SMC cycles - Mali (2015, US $)

	Mali
Total program costs	$2,846,692
Total recurrent costs	$2,786,611
Total start-up costs	$60,081
Average equivalent recurrent cost per child (3-59 months) for four SMC cycles [a]	$4.05
Average equivalent recurrent cost per cycle (3-59 months)	$1.01

[a] *This figure is based on the equivalent number of children (3-59 months) who received four SMC cycles.*

The average equivalent recurrent cost per child (3-59 months) for four cycles of SMC in 2015 was US $4.05. The highest cost elements were remuneration of SMC distributors (38.17%) and drugs and supplies (31.95%). The relatively high cost of remuneration of SMC distributors is likely due to the large number of salaried MoH workers who were trained as SMC distributors, as these costs include a portion of salaries.

Table 38. Recurrent costs and average equivalent recurrent cost per child (3-59 months) for four cycles of SMC – Mali (2015, US $)

Cost categories	Recurrent costs	Percent of recurrent costs	Average equivalent recurrent cost per child for four SMC cycles (3-59 months)
Drugs and supplies	$890,239	31.95%	$1.29
Remuneration of SMC distributors	$1,063,617	38.17%	$1.55
Management	$366,246	13.14%	$0.53
Supervision	$266,252	9.55%	$0.39
Meetings	$56,645	2.03%	$0.08
Training – recurrent	$46,509	1.67%	$0.07
Other recurrent program costs	$97,103	3.48%	$0.14
Total	$2,786,611	100%	$4.05

The majority of recurrent program costs were financed by UNITAID (91.77%) and the Government of Mali funded 7.68% of the costs. The Government of Mali financed 58.11% of the management costs (i.e. salaries of MoH staff) while the USAID SIAPS program, led by MSH, contributed 0.55% for supply chain support to the MoH in the form of management costs.

Table 39. Financing of ACCESS-SMC - recurrent costs – Mali (2015, US $)

	Mali
Total recurrent costs	$2,786,611
UNITAID contributions	$2,557,223
Percent of total recurrent costs	91.77%
Government contributions	$214,144
Percent of total recurrent costs	7.68%
Other contributions	$15,244
Percent of total recurrent costs	0.55%

On average, each SMC distributor administered SMC to 30 children per day. The ratio of total SMC distributors for mobile and fixed point distribution (4,606) to supervisors (658) was 7:1. The estimated wastage rate of SMC was 1.96%.

Table 40. SMC distribution efficiency – Mali (2015)

Efficiency indicators	Mali
Total SMC administered by distributors (including the wastage of drugs)	2,806,247
Total SMC effectively administered by distributors (excluding wastage)	2,751,353
Total wastage of SMC	54,894
Wastage as percent of total SMC distributed	1.96%
Equivalent number of children (3-59 months) who received four cycles of SMC [a]	687,838
Actual SMC treatments provided per distributor per day	30
Actual ratio of distributors per direct supervisors[48]	7:1

a This figure is calculated by dividing the total number of SMC cycles administered by four cycles and does not represent the actual number of children who received four cycles.

In 2015, ACCESS-SMC reached an equivalent of 680,433 children (3-59 months) with four cycles of SMC while other implementing partners reach an equivalent of 705,417 children. Based on the 2015 ACCESS-SMC project recurrent cost estimates, the estimated cost of reaching the 1,504,711 eligible children (3-59 months) who remained with unmet need would have been US $6.1 million.

[48] In Mali, the ratio total SMC distributors for mobile and fixed point distribution (4,606) to supervisors (658) was 7:1. However, the ratio of mobile distributors (3,172) to supervisors (658) was 5:1.

Table 41. Unmet gap of SMC coverage and costs – Mali (2015, US $)

2015 coverage and cost indicators	Mali
Children eligible for SMC (2015)	2,897,966
Equivalent number of children (3-59 months) who received four SMC cycles through ACCESS-SMC [a]	687,838
Equivalent number of children (3-59 months) who received four SMC cycles by other implementing partners [a]	705,417
Equivalent number of children (3-59 months) who received four SMC cycles by all implementing partners (including ACCESS-SMC) [a]	1,393,255
Percent of all eligible children (3-59 months) reached by ACCESS-SMC	23.74%
Percent of eligible children (3-59 months) reached by all implementing partners (including ACCESS-SMC) [b]	48.08%
2015 gap analysis	
Eligible children (3-59 months) with unmet need for SMC	1,504,711
Average number of children not reached by ACCESS-SMC in targeted districts	121,800
Percent of eligible children with unmet need for SMC [c]	51.92%
Cost of reaching additional children with unmet need	$6,095,976

[a] *This figure is calculated by dividing the total number of SMC drugs administered by four months and does not represent the actual number of children who received four cycles.*
[b] *More children were reached but not all of them received the full four cycles.*
[c] *Some as the children included under unmet need received at least one cycle of SMC but not all four cycles.*

According to data from the NMCP, in 2016, ACCESS-SMC plans to target 1,461,520 children (3-59 months) for SMC distribution while other implementing partners[49] plan to reach 411,948 children (3-59 months), covering a total of 49% of all eligible children.

The estimated cost of reaching all the children targeted for SMC (2016) would be approximately US $7.6 million. The estimated cost of meeting the unmet need of 263,341 children would be approximately US $4.5 million. These figures are based on the average equivalent recurrent cost per child (3-59 months) for four cycles of SMC in 2015 and assumed that no additional start-up costs would be needed. Inflation is not included.

[49] Other implementing partners include: USAID/PMI, ALIMA, Mali MoH/PNLP, UNICEF, Médecins Sans Frontières (MSF)-France, and Action Contre La Faim (ACF)

Table 42. Unmet gap of SMC coverage and costs – Mali (2016, US $)

2016 coverage and cost indicators	Mali
Children (3-59 months) eligible for SMC	2,982,007
Children (3-59 months) targeted by ACCESS-SMC	1,461,520
Children (3-59 months) targeted by other implementing partners	411,948
Children (3-59 months) targeted by all implementing partners	1,873,468
Percent of all eligible children (3-59 months) targeted for SMC by ACCESS-SMC	49.01%
2016 gap analysis	
Children (3-59 months) with unmet need for SMC	1,108,539
Cost of reaching children targeted for SMC by all implementing partners (using 2015 unit costs)	$7,589,907
Cost of reaching children with unmet need (using 2015 unit costs)	$4,490,980

Annex 5 - Niger

From August to November 2015, ACCESS-SMC (implemented by CRS in partnership with the National Malaria Control Program and Speak Up Africa) supported the distribution of SMC in eight districts in three regions of Niger,[50] targeting an estimated 595,901 children (3-59 months). Each of the four SMC distribution cycles lasted five days.

During the first three distribution cycles, 2,100 trained volunteer distributors[51] were responsible for distributing SMC at fixed points (350 teams of six-people). In the fourth cycle, an additional 245 trained distributors were taken on to support door-to-door distribution in Maradi District (due to low coverage in the previous cycles). The figure of 2,161 represents an average number of distributors over the four cycles.

Trained staff at the health facility, district, regional, and national levels conducted regular supervision of the SMC distributors throughout the round to monitor the quality of distribution and data reporting while ensuring distributors had available stock of SMC.

Table 43. ACCESS-SMC geographic and population coverage - Niger (2015)

	Niger
Year of SMC commencement in-country	2013
Months of ACCESS-SMC distribution	August - November 2015
Number of distribution cycles per round	4
Number of days per SMC distribution cycle	5 days
Geographic coverage	8 districts in 3 regions
SMC distribution method(s)[52]	Fixed point & door-to-door
Number of SMC distributors [53]	2,161
Number of direct supervisors of SMC distributors	350
Target population (3-59 months)	595,901
Target population (3- <12 months)	106,888
Target population (>12-59 months)	489,013
Ratio of target population per distributor	276

By the end of the round, a total of 1,667,890 SMC had been administered, resulting in the equivalent of 416,973 children (3-59 months) reached,[54] which represented a coverage rate of 69.97%. From the first to the fourth cycle, the number of children reach increased from 342,837 to 477,477.

[50] The ACCESS-SMC project implemented in three regions: Maradi, Tahoua, and Zinder and eight districts: Aguie, Bouza, Madaoua, Maradi, Matameye, Mayahi, Mirriah, and Zinder.

[51] Includes 350 security agents responsible for controlling and managing crowds at SMC distribution sites.

[52] Door-to-door distribution only took place during the fourth cycle in Maradi district.

[53] This figure represents the average number of distributors given the increase of distributors during the fourth cycle.

[54] This figure is calculated by dividing the total number of cycles by four cycles and does not represent the actual number of children who received four complete cycles of SMC as it is estimated that some children did not receive all four cycles. The coverage survey conducted by LSHTM indicates that many of the children received fewer than four cycles, meaning that more children were reached in total but some received three cycles or less.

Coverage surveys that were later conducted by LSHTM indicate that fewer than 50% of the children received the full four cycles, with the remainder each receiving three cycles or less. This presumably shows that more children were reached than the coverage rate indicates but that many of them received less than the recommended four cycles.

Table 44. ACCESS-SMC coverage - Niger (2015)

	Niger
Total number of SMC cycles administered	1,667,890
Equivalent number of children who received four monthly cycles (3-59 months) [a]	416,973
Percent coverage (3-59 months)	**69.97%**
Equivalent number of children who received four monthly cycles (3- <12 months) [a]	74,793
Percent coverage (3- <12 months)	69.97%
Equivalent number of children who received four monthly cycles (>12-59 months) [a]	342,179
Total number of SMC cycles administered	69.97%
2015 SMC round results (children 3-59 months)	
Cycle 1	342,837
Cycle 2	415,255
Cycle 3	432,321
Cycle 4	477,477
Percent of children (3-59 months) who received four full cycles of SMC, based on LSHTM coverage survey	Varies by district[55]

[a] *This figure is calculated by dividing the total number of SMC drugs administered by four cycles and does not represent the actual number of children who received four cycles.*

The estimated 2015 total program costs were US $1,501,826, comprised of start-up costs (i.e. those incurred at the beginning of the program) and recurrent costs (i.e. those that are repeated ever year). Start-up costs amounted to US $49,272 and included costs of the initial launch meetings, planning meetings, the adaptation of job aids and training manuals, among other one-time activities. The recurrent costs totaled US $1,452,554 and included the costs of SMC distributor remuneration, ongoing activities (e.g. meetings, training, supervision visits, etc.), and purchases (e.g. drugs, equipment, reporting tools, etc.).

[55] According to the LSHTM coverage survey conducted in Niger, SMC coverage varied by district. In Aguié, 45% of eligible children received four cycles of SMC and 71% received at least three cycles of SMC. In Madaoua, 43% of children received four SMC cycles and 64% received at least 3 cycles. In Maradi, only 10% of children received at least three cycles and 25% of children received zero cycles. In Zinder, only 13% of children received at least three cycles and 63% received zero cycles.

Table 45. Total program costs and cost for one and four SMC cycles - Niger (2015, US $)

	Niger
Total program costs	**$1,501,826**
Total recurrent costs	**$1,452,554**
Total start-up costs	**$49,272**
Average equivalent recurrent cost per child (3-59 months) for four SMC cycles [a]	**$3.48**
Average equivalent recurrent cost per cycle (3-59 months)	$0.87

[a] *This figure is based on the equivalent number of children (3-59 months) who received four SMC cycles.*

The average equivalent recurrent cost per child (3-59 months) for four cycles of SMC in 2015 was US $3.48. The highest recurrent cost elements were related to drugs and supplies (37.33%) and management (34.52%).

Table 46. Recurrent costs and average equivalent recurrent cost per child (3-59 months) for four cycles of SMC – Niger (2015, US $)

Cost categories	Recurrent costs	Percent of recurrent costs	Average equivalent recurrent cost per child for four SMC cycles (3-59 months)
Drugs and supplies	$542,200	37.33%	$1.30
Remuneration of SMC distributors	$215,740	14.85%	$0.52
Management	$501,429	34.52%	$1.20
Supervision	$106,955	7.36%	$0.26
Meetings	$13,538	0.93%	$0.03
Training - recurrent	$43,548	3.00%	$0.10
Other recurrent program costs	$29,143	2.01%	$0.07
Total	$1,452,554	100%	$3.48

The majority of total recurrent program costs were financed by UNITAID (76.85%) and 23.15% were financed by the Government of Niger. The Government of Niger contributed 67.1% of the management costs (i.e. salaries for MoH staff and salaries of supervisors). This figure is based on the reported average time spent and salaries of NMCP/MoH staff involved in the program.

Table 47. Financing of ACCESS-SMC - recurrent costs – Niger (2015, US $)

	Niger
Total recurrent costs	$1,452,554
UNITAID contributions	$1,116,297
Percent of total recurrent costs	76.85%
Government contributions	$336,257
Percent of total recurrent costs	23.15%
Other contributions	$0
Percent of total recurrent costs	0.00%

On average, each SMC distributor administered SMC to 39 children per day. The average ratio of SMC distributors to direct supervisors was approximately 6:1. Based on data provided, the estimated wastage rate was 1.62%.

Table 48. SMC distribution efficiency – Niger (2015)

Efficiency indicators	Niger
Total SMC administered by distributors (including the wastage of drugs)	1,695,426
Total SMC effectively administered by distributors (excluding wastage)	1,667,890
Total wastage of SMC	27,536
Wastage as percent of total SMC distributed	1.62%
Equivalent number of children (3-59 months) who received four cycles of SMC [a]	416,973
Actual SMC treatments provided per distributor per day	39
Actual ratio of distributors per direct supervisors	6:1

a This figure is calculated by dividing the total number of SMC cycles administered by four cycles and does not represent the actual number of children who received four cycles.

In 2015, ACCESS-SMC reached an equivalent of 623,677 children (3-59 months), while other implementing partners[56] provided SMC to 206,704 children (3-59 months). Based on the 2015 ACCESS-SMC project recurrent cost estimates, the estimated cost of reaching the 3,076,323 million eligible children who remained with unmet need would be approximately US $10.7 million.[57]

[56] Other 2015 implementing partners included MSF Belgium, MSF France, and MSF Suisse.
[57] Plus any additional start-up costs required.

Table 49. Unmet gap of SMC coverage and costs – Niger (2015, US $)

2015 coverage and cost indicators	Niger
Children eligible for SMC (2015)	3,700,000
Equivalent number of children (3-59 months) who received four SMC cycles through ACCESS-SMC [a]	416,973
Equivalent number of children (3-59 months) who received four SMC cycles by other implementing partners [a]	206,704
Equivalent number of children (3-59 months) who received four SMC cycles by all implementing partners (including ACCESS-SMC) [a]	623,677
Percent of all eligible children (3-59 months) reached by ACCESS-SMC	11.27%
Percent of eligible children (3-59 months) reached by all implementing partners (including ACCESS-SMC) [b]	16.86%
2015 gap analysis	
Eligible children (3-59 months) with unmet need for SMC	3,076,323
Average number of children not reached by ACCESS-SMC in targeted districts	178,928
Percent of eligible children with unmet need for SMC [c]	83.14%
Cost of reaching additional children with unmet need	$10,716,582

[a] *This figure is calculated by dividing the total number of SMC drugs administered by four months and does not represent the actual number of children who received four cycles.*
[b] *More children were reached but not all of them received the full four cycles.*
[c] *Some as the children included under unmet need received at least one cycle of SMC but not all four cycles.*

According to data from the Niger NMCP, in 2016, ACCESS-SMC plans to target 1,210,499 children (3-59 months) for SMC distribution while other implementing partners[58] plan to reach 1,056,1127 children (3-59 months).

The estimated cost of reaching all children targeted for SMC (2016) is approximately US $7.9 million. The estimated cost of reaching the 1,573,974 children (3-59 months) with unmet need is US $5.5 million. These estimates are based on the average equivalent recurrent cost per child (3-59 months) for four cycles of SMC in 2015 and assumed that no additional start-up costs would be needed. Inflation was not included.

[58] Other 2016 implementing partners include MSF Suisse and partners supported by the World Bank, UNICEF, Islamic Relief Service, and Bien-Être de la Femme et de l'Enfant au Niger (BEFEN).

Table 50. Unmet gap of SMC coverage and costs – Niger (2016, US $)

2016 coverage and cost indicators	Niger
Children (3-59 months) eligible for SMC	3,840,600
Children (3-59 months) targeted by ACCESS-SMC	1,210,499
Children (3-59 months) targeted by other implementing partners	1,056,127
Children (3-59 months) targeted by all implementing partners	2,266,626
Percent of all eligible children (3-59 months) targeted for SMC by ACCESS-SMC	31.52%
2016 gap analysis	
Children (3-59 months) with unmet need for SMC	1,573,974
Cost of reaching children targeted for SMC by all implementing partners (using 2015 unit costs)	$7,895,948
Cost of reaching children with unmet need (using 2015 unit costs)	$5,483,045

Annex 6 - Nigeria

From August to November 2015, ACCESS-SMC, implemented by Malaria Consortium in partnership with Nigerian National Malaria Elimination Programme (NMEP), supported the distribution of SMC in 17 local government areas (LGAs)[59] in Zamfara and Sokoto states, targeting an estimated 792,133 children (3-59 months). Each of the SMC distribution cycles lasted four days.

A total of 7,954 trained distributors were responsible for distributing SMC by way of three distribution methods. A breakdown of the number of distributors and team composition is as follows:

- Door-to-door: 3,654 total distributors (1,827 two-person teams)
- Fixed point: 2,946 distributors (982 three-person teams)
- Health facility: 1,354 distributors (~451 three-person teams)

To ensure the acceptability of SMC and high rates of coverage within communities, ACCESS-SMC used 543 community mobilizers and 543 town announcers who sensitized communities on the benefits of SMC prior to and during each distribution cycle. In addition, ACCESS-SMC disseminated local language fliers and posters in target areas prior to and during each distribution cycle. In Sokoto State, ACCESS-SMC conducted four radio broadcasts to inform communities about the benefits of SMC and the dates for the upcoming distribution.

Trained staff at the health facility, ward, LGA, state, and national levels conducted regular supervision of the SMC distributors throughout the round to monitor the quality of distribution and data reporting while ensuring distributors had available stock of SMC.

Table 51. ACCESS-SMC geographic and population coverage - Nigeria (2015)

	Nigeria
Year of SMC commencement in-country	2013
Months of ACCESS-SMC distribution	August - November 2015
Number of distribution cycles per round	4
Number of days per SMC distribution cycle	4 days
Geographic coverage	17 LGAs in 2 states
SMC distribution method(s)	Door-to-door & fixed point (including at health facilities)
Number of SMC distributors	7,954
Number of direct supervisors of SMC distributors[60]	182
Target population (3-59 months)	792,133
Target population (3- <12 months)	150,088
Target population (>12-59 months)	642,045
Ratio of target population per distributor	100:1

[59] The ACCESS-SMC supported SMC distribution in the following 10 LGAs in Sokoto: Gada, Goronyo, Gudu, Gwadabawa, Illela, Isa, Sabon Birnin, Tangaza, Wamako and Wurno and the following 7 LGAs in Zamfara: Bakura, Birnin Magaji, Bungudu, Kauran Namoda, Shinkafi Talata, Mafara, and Zurmi.

[60] Ward supervisors

By the end of the round, a total of 3,149,867 cycles of SMC had been administered, resulting in an equivalent of 787,467 children (3-59 months) reached,[61] which represented a coverage rate of 99.41%.[62] From the first to the third cycle, the number of children (3-59 months) receiving SMC increased from 736,858 to 840,392 though the number of children (3-59 months) reached in the fourth cycle dropped to 827,790.

Coverage surveys that were later conducted by LSHTM indicate that only 42% of the children received the full four cycles, with the remainder each receiving three cycles or less. This presumably shows that more children were reached than the coverage rate indicates but that many of them received less than the recommended four cycles.

Table 52. ACCESS-SMC coverage - Nigeria (2015)

	Nigeria
Total number of SMC cycles administered	3,149,867
Equivalent number of children who received four monthly cycles (3-59 months) [a]	787,467
Percent coverage (3-59 months)	99.41%
Equivalent number of children who received four monthly cycles (3- <12 months) [a]	151,432
Percent coverage (3- <12 months)	100.89%
Equivalent number of children who received four monthly cycles (>12-59 months) [a]	636,035
Percent coverage (>12-59 months)	99.06%
2015 SMC round results (children 3-59 months)	
Cycle 1	736,858
Cycle 2	744,827
Cycle 3	840,392
Cycle 4	827,790
Percent of children (3-59 months) who received four full cycles of SMC, based on LSHTM coverage survey	42.4%

[a] *This figure is calculated by dividing the total number of cycles by four cycles and does not represent the actual number of children who received four cycles.*

The estimated 2015 total program costs were US $3,842,413 which are comprised of start-up costs (i.e. those incurred at the beginning of the program) and recurrent costs (i.e. those that are repeated ever year). Start-up costs amounted to US $209,409 and included the costs of the initial launch meetings, planning meetings, the adaptation of job aids and training manuals, among other one-time activities. The recurrent costs totaled US $3,633,004 and included the costs of SMC distributor remuneration, ongoing activities

[61] This figure is calculated by dividing the total number of cycles by four cycles and does not represent the actual number of children who received four complete cycles of SMC as it is estimated that some children did not receive all four cycles. The coverage survey conducted by LSHTM indicates that many of the children received fewer than four cycles, meaning that more children were reached in total but some received three cycles or less.

[62] The equivalent number of children who received SMC was calculated by dividing the total number of SMC provided during the four cycles (3,149,867) by four cycles. This calculation assumes that the child's caregiver successfully administered the remaining two doses of AQ. Information was not provided on how many children received treatment for less than four cycles and the figure, therefore, assumes that the same children received SMC during the four cycles.

(e.g. meetings, training, supervision visits, etc.) and purchases (e.g. drugs, equipment, reporting tools, etc.).

Table 53. Total program costs and cost for one and four SMC cycles – Nigeria (2015, US $)

	Nigeria
Total program costs	$3,842,413
Total recurrent costs	$3,633,004
Total start-up costs	$209,409
Average equivalent recurrent cost per child (3-59 months) for four SMC cycles [a]	$4.61
Average equivalent recurrent cost per cycle (3-59 months)	$1.15

[a] *This figure is based on the equivalent number of children (3-59 months) who received four SMC cycles.*

The average equivalent recurrent cost per child (3-59 months) for four cycles of SMC in 2015 was US $4.61. The majority of the recurrent costs were attributed to the remuneration of SMC distributors (26.67%), drugs and supplies (27.35%), recurrent training (17.06%), and management (14.72%) in the form of MoH/NMEP and Malaria Consortium personnel salaries.

Table 54. Recurrent costs and average equivalent recurrent cost per child (3-59 months) for four cycles of SMC – Nigeria (2015, US $)

Cost categories	Recurrent costs	Percent of recurrent costs	Average equivalent recurrent cost per child for four SMC cycles (3-59 months)
Drugs and supplies	$969,070	26.67%	$1.23
Remuneration of SMC distributors	$993,805	27.35%	$1.26
Management	$534,894	14.72%	$0.68
Supervision	$159,963	4.40%	$0.20
Meetings	$181,387	4.99%	$0.23
Training - recurrent	$619,645	17.06%	$0.79
Other recurrent program costs	$174,242	4.80%	$0.22
Total	$3,633,004	100%	$4.61

The majority of total recurrent program costs were financed by UNITAID (87.44%) with 12.56% financed by the Government of Nigeria including 4% of management (i.e. salaries for MoH/NMEP personnel) and 43.8% of SMC distributor remuneration for trained MoH distributors who received a salary.

Table 55. Financing of ACCESS-SMC - recurrent costs – Nigeria (2015, US $)

	Nigeria
Total recurrent costs	$3,633,004
UNITAID contributions	$3,176,562
Percent of total recurrent costs	87.44%
Government contributions	$456,442
Percent of total recurrent costs	12.56%
Other contributions	$0
Percent of total recurrent costs	0.00%

On average, each SMC distributor administered SMC to 25 children per day. The average ratio of SMC distributors to direct supervisors (ward supervisors) was approximately 44 : 1. It was estimated that the wastage rate of SMC was 1.52%. Additional data would be required to determine the efficiency indicators of the three distribution strategies (door-to-door, fixed point, and fixed point at health facilities) which were unavailable from ACCESS-SMC in 2015.

Table 56. SMC distribution efficiency – Nigeria (2015)

Efficiency indicators	Nigeria
Total SMC administered by distributors (including the wastage of drugs)	3,198,414
Total SMC effectively administered by distributors (excluding wastage)	3,149,867
Total wastage of SMC	48,547
Wastage as percent of total SMC distributed	1.52%
Equivalent number of children (3-59 months) who received four cycles of SMC [a]	787,467
Actual SMC treatments provided per distributor per day	25
Actual ratio of distributors per direct supervisors[63]	44:1

a This figure is calculated by dividing the total number of SMC cycles administered by four cycles and does not represent the actual number of children who received four cycles.

In 2015, ACCESS-SMC reached an equivalent of 787,467 children (3-59 months).[64] Other implementing partners delivered SMC to 180,295 children (3-59 months) in Jigawa and Katsina states. Based on the 2015 ACCESS-SMC project recurrent cost estimates, the estimated recurrent cost of reaching the additional children who remained with unmet need would have been approximately US $45.6 million. It should be noted that the estimates for Nigeria may be low, since expanding coverage would involve starting in other provinces where the project did not operate in 2015. Finally, since the cost figures are based on four cycles of treatment and in some cases not all children received the full

[63] In Nigeria, the ratio of total SMC distributors for door-to-door, fixed point, and health center distribution (7,954) to ward supervisors (182) was 44: 1. However, the ratio of door-to-door distributors (3,654) to ward supervisors (182) was 20: 1.

[64] According to Malaria Consortium and the NMEP, the 2015 target population for SMC distribution may have been overestimated.

four cycles, the actual cost of providing four full cycles of SMC to child would likely be higher since it would require more supervision and follow-up.

Table 57. Unmet gap of SMC coverage and costs – Nigeria (2015, US $)

2015 coverage and cost indicators	Nigeria
Children eligible for SMC (2015)	10,851,345
Equivalent number of children (3-59 months) who received four SMC cycles through ACCESS-SMC A	787,467
Equivalent number of children (3-59 months) who received four SMC cycles by other implementing partners A	180,295
Equivalent number of children (3-59 months) who received four SMC cycles by all implementing partners (including ACCESS-SMC) A	967,762
Percent of all eligible children (3-59 months) reached by ACCESS-SMC	7.26%
Percent of eligible children (3-59 months) reached by all implementing partners (including ACCESS-SMC) [b]	8.92%
2015 gap analysis	
Eligible children (3-59 months) with unmet need for SMC	9,883,583
Average number of children not reached by ACCESS-SMC in targeted districts	4,666
Percent of eligible children with unmet need for SMC C	91.08%
Cost of reaching additional children with unmet need	$45,598,241

[a] *This figure is calculated by dividing the total number of SMC drugs administered by four months and does not represent the actual number of children who received four cycles.*
[b] *More children were reached but not all of them received the full four cycles.*
[c] *Some of the children included under unmet need received at least one cycle of SMC but not all four cycles.*

According to data provided by the Nigeria NMEP, in 2016, ACCESS-SMC plans to target 1,735,602 children (3-59 months) for SMC distribution; no other implementing partners plan to implement SMC in 2016. The estimated cost of reaching all children targeted for SMC in 2016 is 43.7 million. These estimates are based on the average equivalent recurrent cost per child (3-59 months) for four cycles of SMC in 2015 and assumed that no additional start-up costs would be needed. Inflation is not included.

Table 58. Unmet gap of SMC coverage and costs – Nigeria (2016, US $)

2016 coverage and cost indicators	Nigeria
Children (3-59 months) eligible for SMC	11,198,591
Children (3-59 months) targeted by ACCESS-SMC	1,735,602
Children (3-59 months) targeted by other implementing partners	0
Children (3-59 months) targeted by all implementing partners	1,735,602
Percent of all eligible children (3-59 months) targeted for SMC by ACCESS-SMC	15.50%
2016 gap analysis	
Children (3-59 months) with unmet need for SMC	9,462,989
Cost of reaching children targeted for SMC by all implementing partners (using 2015 unit costs)	$7.8 million
Cost of reaching children with unmet need (using 2015 unit costs)	$42.45 million

Annex 7 - The Gambia

From August to November 2015, ACCESS-SMC (implemented by CRS in partnership with The Gambian National Malaria Control Program and Speak Up Africa) supported the distribution of SMC in 18 districts in two regions of The Gambia,[65] targeting an estimated 90,925 children (3-59 months). Each of the four distribution cycles lasted five days. Due to shortages of electronic tablets for data reporting, ACCESS-SMC conducted separate, consecutive SMC cycles in the two regions.

A combined 582 trained volunteer[66] distributors and data collectors distributed SMC by traveling door-to-door (two-person teams) and used electronic tablets to record patient information and report on number of children receiving SMC.[67] SMC distributors used pill crushers to facilitate the distribution of SMC. To ensure the acceptability of SMC and high rates of coverage within communities, ACCESS-SMC supported the airing of television and radio spots prior to and during each distribution cycle.

Trained staff (including logisticians, data managers, and store managers) at the health facility, district, regional, and national levels conducted regular supervision of the SMC distributors throughout the round to monitor the quality of distribution and data reporting while ensuring distributors had available stock of SMC.

Table 59. ACCESS-SMC geographic and population coverage - The Gambia (2015)

	The Gambia
Year of SMC commencement in-country	2014
Months of ACCESS-SMC distribution	August - November 2015
Number of distribution cycles per round	4
Number of days per SMC distribution cycle	5 days
Geographic coverage	18 districts in 2 regions
SMC distribution method(s)	Door-to-door
Number of SMC distributors	582
Number of direct supervisors of SMC distributors[68]	65
Target population (3-59 months)	90,925
Target population (3- <12 months)	15,859
Target population (>12-59 months)	75,066
Ratio of target population per distributor	156

By the end of the round, a total of 308,830 cycles of SMC had been administered, resulting in an equivalent of 77,208 children (3-59 months) reached.[69] This represented a coverage

[65] The ACCESS-SMC project supported SMC distribution in two regions: Central River Region (CRR) and Upper River Region (URR) and 18 districts: Lower Saloum, Upper Saloum, Nianija, Niani, Sami, Niamina Dankunku, Niamina West, Niamina East, Lower Fuladu West, Upper Fulladu West, Janjanbureh, Jimara, Basse, Tumana, Kantora, Wulli West, Wulli East, and Sandu.

[66] Distributors and data collectors received 350 Delasi per day.

[67] Data collectors continued to fill out daily tally sheets.

[68] In The Gambia, the ACCESS-SMC project trained 291 teams made up of one data collector and one SMC distributor (total: 582) and SMC cycles were carried out consecutively (not simultaneously) in two regions. This number of does not include volunteers trained on social mobilization who did not participate in the distribution of SMC.

rate of 84.91%. From the first to the fourth cycle, the number of SMC cycles administered increased from 71,121 to 76,922, respectively.

Coverage surveys that were later conducted by LSHTM indicate that only 55.5% of the children received the full four cycles, with the remainder each receiving three cycles or less. This presumably shows that of the children reached, many of them received less than the recommended four cycles.

Table 60. ACCESS-SMC coverage - The Gambia (2015)

	The Gambia
Total number of SMC cycles administered	308,830
Equivalent number of children who received four monthly cycles (3-59 months) [a]	77,208
Percent coverage (3-59 months)	84.91%
Equivalent number of children who received four monthly cycles (3- <12 months) [a]	12,408
Percent coverage (3- <12 months)	78.24%
Equivalent number of children who received four monthly cycles (>12-59 months) [a]	64,799
Percent coverage (>12-59 months)	86.32%
2015 SMC round results (children 3-59 months)	
Cycle 1	71,121
Cycle 2	84,298
Cycle 3	76,489
Cycle 4	76,922
Percent of children (3-59 months) who received four full cycles of SMC, based on LSHTM coverage survey	55.5%

[a] *This figure is calculated by dividing the total number of cycles by four cycles and does not represent the actual number of children who received four cycles.*

The estimated 2015 total program costs were US $564,323, comprised of start-up costs (i.e. those incurred at the beginning of the program) and recurrent costs (i.e. those that are repeated ever year). Start-up costs amounted to US $56,011 and included costs of the initial launch meetings, planning meetings, the adaptation of job aids and training manuals, the production of videos and radio spots, listening and focus groups, among other one-time activities. The recurrent costs totaled US $508,312 and included the costs of ongoing activities (e.g. meetings, training, supervision visits, etc.) and purchases (e.g. drugs, equipment, etc.).

[69] This figure is calculated by dividing the total number of cycles by four cycles and does not represent the actual number of children who received four complete cycles of SMC as it is estimated that some children did not receive all four cycles. The coverage survey conducted by LSHTM indicates that many of the children received fewer than four cycles, meaning that more children were reached in total but some received three cycles or less.

Table 61. Total program costs and cost for one and four SMC cycles – The Gambia (2015, US $)

	The Gambia
Total program costs	$564,323
Total recurrent costs	$508,312
Total start-up costs	$56,011
Average equivalent recurrent cost per child (3-59 months) for four SMC cycles [a]	$6.58
Average equivalent recurrent cost per cycle (3-59 months)	$1.65

[a] *This figure is based on the equivalent number of children (3-59 months) who received four SMC cycles.*

The average equivalent recurrent cost per child (3-59 months) for four cycles of SMC in 2015 was US $6.58. The largest programmatic cost-drivers were for drugs and supplies (22.05%) followed by remuneration of SMC distributors (20.04%), and recurrent training (19.91%).

Table 62. Recurrent costs and average equivalent recurrent cost per child (3-59 months) for four cycles of SMC – The Gambia (2015, US $)

Cost drivers	Recurrent costs	Percent of recurrent costs	Average recurrent for four cycles (3-59 months)
Drugs and supplies	$112,080	22.05%	$1.45
Remuneration of SMC distributors	$101,850	20.04%	$1.32
Management	$64,376	12.66%	$0.83
Supervision	$88,221	17.36%	$1.14
Meetings	$4,231	0.83%	$0.05
Training – recurrent	$101,203	19.91%	$1.31
Other recurrent program costs	$36,351	7.15%	$0.47
Total	$508,312	100%	$6.58

The majority of recurrent program costs (94.06%) were financed by UNITAID with the other 5.94% funded by the Gambian government, which funded 46.9% of the management costs. This figure is based on the reported average time spent and salaries of NMCP/MoH staff involved in supporting the program at all levels of the health system. Management costs financed by UNITAID included those paid to CRS and Speak Up Africa as well as top-up payments paid to NMCP/MoH staff.

Table 63. Financing of ACCESS-SMC - recurrent costs – The Gambia (2015, US $)

	The Gambia
Total recurrent costs	$508,312
UNITAID contributions	$478,112
Percent of total recurrent costs	94.06%
Government contributions	$30,201
Percent of total recurrent costs	5.94%
Other contributions	$0
Percent of total recurrent costs	0.00%

On average, each SMC distributor administered SMC to 27 children per day. The average ratio of SMC distributors to direct supervisors was approximately 9 : 1. According to data provided, the estimated wastage rate of SMC was 0.45%.

Table 64. SMC distribution efficiency – The Gambia (2015)

Efficiency indicators	The Gambia
Total SMC administered by distributors (including the wastage of drugs)	310,241
Total SMC effectively administered by distributors (excluding wastage)	308,830
Total wastage of SMC	1,411
Wastage as percent of total SMC distributed	0.45%
Equivalent number of children (3-59 months) who received four cycles of SMC [a]	77,208
Actual SMC treatments provided per distributor per day	27
Actual ratio of distributors per direct supervisors	9:1

a This figure is calculated by dividing the total number of SMC cycles administered by four cycles and does not represent the actual number of children who received four cycles.

In 2015, ACCESS-SMC reached an equivalent of 77,208 SMC children (3-59 months).[70] There were no other implementing partners distributing SMC in-country. The estimated cost of reaching the remaining 13,717 eligible children with unmet need would have been US $90,308.[71] This is based on the average equivalent recurrent cost per child (3-59 months) for four cycles of SMC in 2015 and assumes that no further start-up costs would be needed or additional economies of scale achieved.

[70] According to CRS and the NMCP, the 2015 target population for SMC distribution may have been overestimated.

[71] Plus any additional start-up costs required.

Table 65. Unmet gap of SMC coverage and costs – The Gambia (2015, US $)

2015 coverage and cost indicators	The Gambia
Children (3-59 months) eligible for SMC	90,925
Equivalent number of children (3-59 months) who received four SMC cycles through ACCESS-SMC [a]	77,208
Equivalent number of children (3-59 months) who received four SMC cycles by other implementing partners [a]	0
Equivalent number of children (3-59 months) who received four SMC cycles by all implementing partners (including ACCESS-SMC) [a]	77,208
Percent of all eligible children (3-59 months) reached by ACCESS-SMC	84.91%
Percent of eligible children (3-59 months) reached by all implementing partners (including ACCESS-SMC) [b]	84.91%
2015 gap analysis	
Eligible children (3-59 months) with unmet need for SMC	13,717
Average number of children not reached by ACCESS-SMC in targeted districts	13,717
Percent of eligible children with unmet need for SMC [c]	15.09%
Cost of reaching additional children with unmet need	$90,308

[a] *This figure is calculated by dividing the total number of SMC drugs administered by four months and does not represent the actual number of children who received four cycles.*
[b] *More children were reached but not all of them received the full four cycles.*
[c] *Some of the children included under unmet need received at least one cycle of SMC but not all four cycles.*

According to data from CRS, in 2016, ACCESS-SMC plans to maintain the same 2015 target population for SMC distribution of 90,925 children (3-59 months); no other implementing partners plan to implement SMC in 2016. The estimated cost of reaching all children targeted for SMC (2016) is US $598,621. These estimates are based on the average equivalent recurrent cost per child (3-59 months) for four cycles of SMC in 2015 and assumed that no additional start-up costs would be needed. Inflation is not included.

Table 66. Unmet gap of SMC coverage and costs – The Gambia (2016, US $)

2016 coverage and cost indicators	The Gambia
Children (3-59 months) eligible for SMC	90,925
Children (3-59 months) targeted by ACCESS-SMC	90,925
Children (3-59 months) targeted by other implementing partners	0
Children (3-59 months) targeted by all implementing partners	90,925
Percent of all eligible children (3-59 months) targeted for SMC by ACCESS-SMC	100.00%
2016 gap analysis	
Children (3-59 months) with unmet need for SMC	0
Cost of reaching children targeted for SMC by all implementing partners (using 2015 unit costs)	$598,621
Cost of reaching children with unmet need (using 2015 unit costs)	$0

Annex 8. Key Contributors

The following individuals are acknowledged for their significant contributions to this report:

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