GiveWell

TOP CHARITY REPORT

Malaria Consortium – Seasonal Malaria Chemoprevention

Version: February 2018

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Table of Contents

Summary

What do they do? Malaria Consortium (**malariaconsortium.org**) works on preventing, controlling, and treating malaria and other communicable diseases in Africa and Asia. We have only reviewed its **seasonal malaria chemoprevention (SMC)** program, which distributes preventive anti-malarial drugs to children 3 to 59 months old in order to prevent illness and death from malaria; our recommendation is just for this part of Malaria Consortium's work. (**More**)

Does it work? There is strong evidence that SMC substantially reduces cases of malaria. Malaria Consortium has conducted studies in the countries where it has worked to determine whether its programs have reached a large proportion of children targeted. These studies have generally found that about 91% of children received at least one month of SMC treatment (out of four possible months), about 69% received three months of treatment, and about 51% received all four months of treatment. These past results rely on the assumption that community health workers and caregivers keep accurate records, or that caregivers accurately report, at the end of the four month cycle, whether their children received and took SMC, or that they accurately record doses on a card. Starting in 2017, Malaria Consortium is also conducting some coverage surveys after each round of SMC, to reduce the possibility that caregivers will remember incorrectly. Malaria Consortium has conducted additional research on the efficacy of SMC in its programs. (**More**)

What do you get for your dollar? SMC programs appear to be in the range of cost-effectiveness of our other **priority programs**. (**More**)

Is there room for more funding? We believe that Malaria Consortium could productively use more funding than it expects to receive to scale up its SMC activities. It appears that there is a large remaining global need for additional funding for SMC programs. (**More**) *December 2017 update: In November 2017, we recommended that Good Ventures give $27.9 million to Malaria Consortium. After accounting for this grant, we expect that Malaria Consortium will continue to have a funding gap for 2018-2020 on the order of tens of millions of dollars. Details below.*

Malaria Consortium's seasonal malaria chemoprevention program is recommended because:

- SMC is a program with a strong evidence base and strong cost-effectiveness. (**More**)

- Track record – Malaria Consortium has experience with supporting large-scale SMC programs. (**More**)
- Room for more funding – we believe that Malaria Consortium could productively use more funding than it expects to receive to scale up its SMC activities. (**More**)

Major open questions include:

- How accurate are surveys that aim to determine what portion of children targeted by the program received and took SMC?
- Will Malaria Consortium-supported SMC programs be able to achieve high levels of coverage in the future? Will Malaria Consortium's monitoring provide high-quality evidence of its programs' impact?
- Will other large funders fill the remaining funding gaps for SMC? Based on information from Malaria Consortium, we think this is unlikely in the next couple of years, but there is uncertainty because SMC may become a higher priority for governments and funders in the future.

Our review process

We began speaking to Malaria Consortium about the possibility of reviewing one of its programs in January 2016.

Over the next several months we tried to determine which of Malaria Consortium's programs we should prioritize evaluating for a possible recommendation, and we ultimately settled on seasonal malaria chemoprevention (SMC). The other programs that we investigated included: bed nets, deworming, dengue control, injectable artesunate for severe malaria, integrated community case management (ICCM), micronutrient powders, malnutrition management, neglected tropical diseases morbidity management, integration of nutrition with SMC, diagnosis of malaria, and diagnosis of pneumonia.

To date, we have:

- Had multiple conversations with Malaria Consortium staff over the course of 2016 and 2017.[1]
- Spoken with a researcher at the London School of Hygiene and Tropical Medicine who has led the work on evaluating the ACCESS-SMC project, a large-scale SMC project led by Malaria Consortium.[2]
- Reviewed documents that Malaria Consortium shared with us.

What do they do?

Malaria Consortium works on preventing, controlling, and treating malaria and other communicable diseases.[3] It was established in 2003 and has programs and projects in 12 countries across Africa and Southeast Asia.[4] Malaria Consortium's total spending from April 2016 to March 2017 was about $64 million, with about 88% of its spending coming from restricted funds.[5]

This page focuses exclusively on its **seasonal malaria chemoprevention (SMC)** programs, which aim to distribute preventive anti-malarial drugs to children 3 months to 59 months old in order to prevent illness and death from malaria.[6]

The remainder of this section provides more detail on:

- **Implementation of SMC programs**
- **Malaria Consortium-supported SMC programs**
- **Spending on SMC programs**
- **Malaria Consortium's role in SMC programs**

Implementation of SMC programs

What are SMC programs?

As we wrote in our **intervention report on SMC**, seasonal malaria chemoprevention is the intermittent administration of full treatment courses of an antimalarial medicine to children during the rainy season in areas of highly seasonal malaria transmission.[7] It "consists of administering a maximum of four treatment courses of SP [sulfadoxine–pyrimethamine] + AQ [amodiaquine] at monthly intervals to children aged 3–59 months in areas of highly seasonal malaria transmission [during the high malaria transmission period]."[8] SMC was "formerly known as 'intermittent preventive treatment of malaria in children [IPTc].'"[9]

According to the World Health Organization (WHO):

The suitability of an area for SMC is determined by the seasonal pattern of rainfall, malaria transmission and the burden of malaria. SMC is recommended for deployment in areas:

- where more than 60% of the annual incidence of malaria occurs within 4 months;
- where there are measures of disease burden consistent with a high burden of malaria in children (incidence ≥ 10 cases of malaria among every 100 children during the transmission season);
- where SP and AQ retain their antimalarial efficacy.[10]

According to the WHO, "SMC provides protection for up to 1 month after each complete (3-day) course.... Health workers should give the dose of SP and the first dose of AQ to the children under their direct observation and should advise the children's caregivers on how to give the second and third doses of AQ to the child at home [one dissolved tablet per day, for two days]."[11]

Malaria Consortium SMC implementation methods

Malaria Consortium supports training of health workers and community health workers (CHWs) to deliver treatments either by going door-to-door or by treating people in a community at a fixed point.[12] Our impression is that CHWs most often go door-to-door in Malaria Consortium's programs.[13] Malaria Consortium told us that CHWs are typically people in the community who work year-round to support basic delivery of health interventions such as vaccines; malaria diagnosis, referral and treatment; nutrition programs, etc.[14] Malaria Consortium told us that CHWs are typically paid about $5 to $7 per day for programs such as SMC, though this amount varies by country.[15] Malaria Consortium also supports training for supervisors for the program.[16]

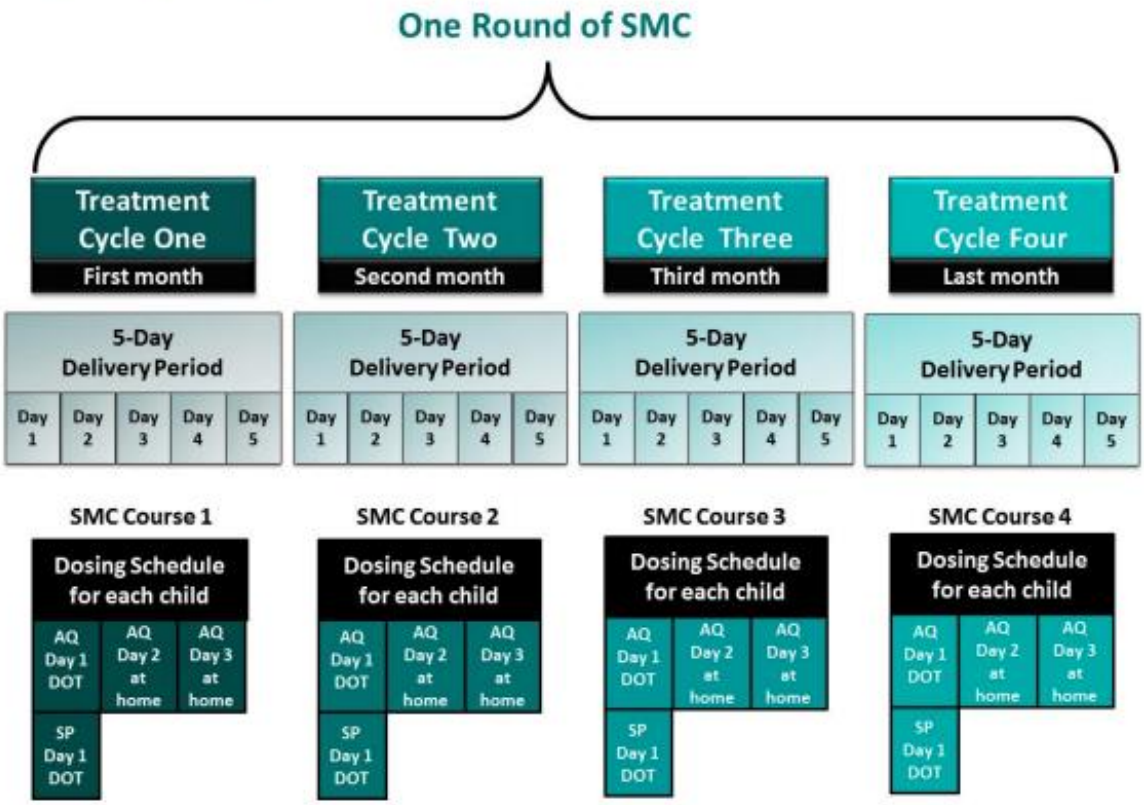
Malaria Consortium typically aims to support four treatment "cycles" (one cycle per month in the malaria season).[17] For each cycle, Malaria Consortium instructs CHWs to:

1. determine whether the child is eligible for SMC and give the age appropriate dose.[18]
2. refer all acutely sick children and children with fever to the health facility for evaluation and testing for malaria.[19]
3. directly observe the child swallowing the first dose (SP+AQ) and then monitor the child for 30 minutes after they have taken the medication.[20]
4. give the child's caregiver 2 tablets of AQ and explain how to give the doses over the following two days.[21]
5. advise the child's caregivers to mark a card to record that they've given the other two doses,[22] to give the medication again if the child vomits (and to visit the CHW to request

additional treatments if this happens), and to take the child to the health facility if they get a fever or are very sick.[23]

This is a diagram of the delivery schedule:[24]

Figure 1: Illustration of 1 Round of SMC



Other relevant aspects of the program are:

- Malaria Consortium instructs CHWs not to give treatment to children who: are younger than 3 months or older than 59 months; have a fever or are severely ill (these children should be referred to the local health facility); are taking another sulfa-based medication such as cotrimoxazole; have received another dose of AQ or SP during the past month; or have an allergy to a sulfa-based medication, AQ, or SP.[25] Malaria Consortium told us that CHWs are trained to follow a checklist, which is translated into local languages, in order to check for these issues.[26] We do not know how often CHWs follow all of the suggested instructions in practice. Malaria Consortium notes that program supervisors oversee CHWs and that CHWs are surveyed about their compliance.[27] We have not yet investigated the methodology behind

supervision in SMC programs and do not believe that CHW self-reporting is likely to be reliable on this question.

- Malaria Consortium instructs CHWs to give a different dose to children aged 3 to 12 months old than they give to children 12 to 59 months old.[28] Drug packets include pictures of an infant or a child and are color-coded, and CHWs are trained to ask caregivers a set of questions and look for age-related milestones to establish the age of the child.[29]

Malaria Consortium has shared with us a detailed description of ACCESS-SMC's processes for supervising the drug administration process, which we include in the following footnote.[30]

More details on how Malaria Consortium assesses the coverage achieved by the SMC programs it supports are **below**. Malaria Consortium told us that a major challenge with delivering SMC treatments is that the rainy season is often one of the most difficult times of year to carry out logistically-complex programs.[31]

Malaria Consortium-supported SMC programs

We have seen information from two major SMC projects that Malaria Consortium has supported:

- **Pilot and scale-up of SMC in northern Nigeria:** The Bill & Melinda Gates Foundation (BMGF) provided about $1.7 million to Malaria Consortium to do operational research on the best way to deliver SMC at scale in Katsina state in northern Nigeria, and then to implement its chosen delivery system and assess its efficiency and impact.[32] Malaria Consortium told us that it trained over 3,600 CHWs and nearly 200 health workers to provide about 1.6 million treatments to roughly 350,000 children who lived in 4 "local government areas" (LGAs) in northern Nigeria in 2012-2014.[33] A major goal of the project was to share what it learned; we have seen a published paper with Malaria Consortium's major lessons about how to deliver SMC but have not yet reviewed it in detail.[34]
- **ACCESS-SMC**: Unitaid awarded up to $67 million to Malaria Consortium to lead a project to reach up to 7 million children per year in seven countries in the Sahel region of Africa.[35] In May 2014, Malaria Consortium wrote that this was the "largest-yet global programme" for SMC.[36] ACCESS-SMC was led by Malaria Consortium, with Catholic Relief Services as the "primary sub-grantee" and support from many other organizations, including impact evaluation from the London School of Hygiene & Tropical Medicine (LSHTM).[37] Malaria

Consortium told us that its role in ACCESS-SMC included leading implementation of SMC in three of the seven ACCESS-SMC countries (Burkina Faso, Chad, and Nigeria), overseeing budgets and planning for all ACCESS-SMC activities, and overseeing research (including methodology and presentation).[38] Our impression is that ACCESS-SMC pays for almost all aspects of program implementation and monitoring, including medicines and supplies, per diems for CHWs, training for CHWs, trainers, supervisors, and health facility workers, and research.[39] Malaria Consortium shared the following source with us to help explain its staff structure: **ACCESS-SMC, organizational structure**.

In addition, in 2017, Malaria Consortium began using funding received as a result of GiveWell's recommendation (which we refer to as "GiveWell-directed funds") to support SMC in six additional LGAs in Nigeria (to restart SMC that had been supported previously by a one-off grant), eight additional districts in Burkina Faso (for which drugs but not operational costs were available from other sources for 2017), and one region in Guinea Bissau.[40] GiveWell-directed funds will also support coverage surveys and monitoring for Malaria Consortium's overall SMC work.[41]

Malaria Consortium told us that the above programs represent the bulk of Malaria Consortium's work on SMC so far.[42]

Malaria Consortium's spending on SMC programs

We have seen spending data from 2016 for the ACCESS-SMC program[43] and some projected spending for programs supported by the GiveWell-directed funds that Malaria Consortium received by early 2017.[44] It is our understanding that these are the main two SMC programs that Malaria Consortium works on as of 2017.

In 2016, direct costs for the ACCESS-SMC program went to: 37% to procuring SMC drugs, 37% to delivery of drugs, 16% to staff (including staff at partner organizations), 5% to "direct common costs" (we're not sure what this refers to), and the remaining 5% to a variety of smaller activities.

Of GiveWell-directed funds, Malaria Consortium has budgeted to spend in 2017 about $4.8 million of the about $5 million that it has received: $2.9 million (61%) on SMC delivery in areas not supported by ACCESS-SMC,[45] $1.3 million on additional coverage surveys, and other monitoring support aimed at improving the accuracy of administrative data, in areas where

treatments are supported by ACCESS-SMC (27%),[46] and $0.6 million on a data management overhaul, global coordination costs, and indirect costs (12%).[47]

For prior work, we have also seen spending data for the pilot and scale-up of SMC in northern Nigeria.[48]

We also provide some information on the estimated cost-per-treatment of Malaria Consortium-supported SMC programs **below**.

Malaria Consortium's role in SMC programs

Malaria Consortium's SMC work varies by country, but in general includes the following activities:[49]

- Determining the quantity of drugs needed, procurement of drugs, and international shipping[50]
- Funding distributions, including in-country storage and transportation of drugs and payments to front-line distributors to compensate them for the time they spend on the program
- Technical assistance, such as logistical planning, design of social mobilization tools, review of prior implementation and revisions to procedures
- Financial management and oversight, including disbursing funds to local organizations, Ministries of Health, and/or CHWs, collecting and validating receipts, and preparing financial reports
- Developing training materials and training staff at various levels[51]
- Monitoring, evaluation and research, including Malaria Consortium staff who directly observe program activities, and funding and coordinating with a university to conduct coverage surveys and to track changes in malaria incidence and death, monitoring of drug resistance, and other research.
- Advocacy to governments and fundraising for SMC programs

Does it work?

Malaria Consortium-supported SMC programs are focused on delivering treatments that have been independently studied in rigorous trials and found to be effective.

Malaria Consortium and its partners have conducted monitoring to determine what proportion of children targeted by its SMC programs receive treatments. We have seen headline results from coverage surveys for 2015 and 2016 distributions in all seven ACCESS-SMC countries and early results from 2017 programs. A weighted average of the ACCESS-SMC surveys finds that about 91% of children received at least one month of SMC treatment, about 69% received three months of treatment, and about 51% received all four months of treatment.[52] These results rely on the assumption that CHWs and caregivers accurately record SMC doses on SMC cards and/or that caregivers accurately report whether their children received and took SMC, which could lead to results over- or underestimating actual coverage.

Other monitoring and evaluation Malaria Consortium has shared includes:

- A study of malaria incidence before and during its SMC program in Northern Nigeria.
- A case-control study to measure how the protective effect of SMC in scale-up contexts compares with that found in randomized controlled trials.
- A baseline assessment of the prevalence of genetic markers for resistance to SMC drugs among malaria parasites, with a follow-up expected to take place in 2017.
- Results from following up with a cohort of 10,000 SMC recipients to track the rate of adverse events.

Details follow.

Is SMC an effective intervention?

SMC appears to have strong evidence of effectiveness. Seven randomized controlled trials provide strong evidence that SMC substantially reduces cases of malaria. More details are available at our **intervention report on SMC**.

Is Malaria Consortium working in areas suitable for SMC?

Malaria Consortium told us that before starting work in countries under the ACCESS-SMC program it conducted an assessment of the overall burden of malaria, transmission and rainfall patterns, regional malaria incidence over time, and seasonal variations in malaria.[53] We have not reviewed this evidence in detail, but it seems highly likely to us that Malaria Consortium is working in areas that are suitable for SMC because it is working in countries with high malaria burdens and where it seems that malaria is seasonal.[54]

More information on our estimates of malaria burden in the countries where Malaria Consortium is working is available in our **cost-effectiveness analysis**.

Are targeted children being reached?

We have seen coverage survey results from the bulk of Malaria Consortium-supported SMC programs so far. A weighted average of these surveys from 2015 and 2016 finds that about 91% of children received at least one month of SMC treatment, about 69% received three months of treatment, and about 51% received all four months of treatment.[55]

Two methods for estimating coverage

Malaria Consortium uses two different methods to measure the coverage rate that it is achieving with its programs:[56]

1. **"Administrative" coverage:** These coverage estimates are generated by collecting information from CHWs' records about how many treatments they directly observed.[57] Malaria Consortium provided a summary of the process for collecting and verifying this information, which we have included in the following footnote.[58] We have not yet tried to assess this process.
2. **Coverage surveys:** Data collectors visit a random sample of households in the target region, ask to review eligible children's caregivers' SMC record cards, and ask a variety of other questions to understand the quality of the program and the likely coverage of SMC. More details below.

It appears that there are sometimes large discrepancies in the estimates of coverage between these two measures, usually with administrative coverage estimates finding higher levels of coverage.[59] Malaria Consortium told us that possible reasons for discrepancies between administrative coverage estimates and coverage surveys include:[60]

- In some countries, large temporary migrant populations move into SMC treatment areas during the rainy season (such as nomadic tribes, or settled populations migrating for seasonal agricultural work or animal husbandry[61]) and then leave before they would be interviewed by coverage surveys.
- A substantial number of treatments are likely going to children who are roughly five to seven years old.[62]
- CHWs may be treating some people who live outside of the target coverage areas.
- There could be errors either in the number of treatments reported (the numerator) or in the assumed target population (the denominator).

In 2017, SMC programs supported by Malaria Consortium in Nigeria, Chad, and Burkina Faso began conducting coverage surveys after each SMC cycle, rather than a single coverage survey after all four cycles, in part to better understand why there are discrepancies between coverage estimates.[63]

Below, we focus on analyzing Malaria Consortium's coverage surveys because we believe that coverage surveys are more likely to be accurate.

For reference, all of the results from the administrative coverage estimates that we had seen by late 2016 are in the following footnote;[64] Malaria Consortium shared additional data with us in 2017 from 2016 and 2017 programs, which we have not reviewed in detail. It appears that according to administrative coverage estimates, ACCESS-SMC's overall coverage rate of its target population was about 91% in 2015.[65] We have not vetted this estimate.

Coverage surveys

ACCESS-SMC methodology

We have not seen full reports on the details of how coverage surveys have been carried out (though we expect to in the future). The process described below is from the ACCESS-SMC monitoring and evaluation plan and from a conversation, in 2017, with the principal investigator who has led the work on the coverage surveys.[66]

- Coverage surveys have been led by the London School of Hygiene and Tropical Medicine (LSHTM).[67]
- In 2015 and 2016, ACCESS-SMC conducted one coverage survey in each country,[68] following the last SMC cycle for the year.[69] In 2017, coverage surveys began to be conducted following each SMC cycle (of which there are four per year) in Malaria Consortium-supported areas.[70]
- The sampling method is designed to yield a sample that is representative of the full population receiving the program (with the exception of Niger, where four areas were selected non-randomly but with the intention of being representative of the country as a whole). Villages were selected randomly (using probability proportional to size sampling). Within villages, researchers make a map of the village on a computer tablet and divide it into segments, the tablet automatically chooses a segment at random, and the interviewers are instructed to visit every household in that segment.[71] Each survey aims for a sample size of at least 600 children aged 3 months to 59 months old.[72]
- The 2015 and 2016 surveys aimed to assess the proportion of eligible children who received 0, 1, 2, 3, or 4 SMC treatments.[73] The 2017 surveys aim to assess the proportion of children who received the most recent cycle of SMC.[74] In 2015 and 2016, surveyors were instructed to both ask caregivers "Did you get a blister pack in the first month, the second month, the third month, and the most recent month?" and to ask to see the child's SMC card and record what is written on it.[75] Surveyors are also instructed to ask a variety of other questions to attempt to understand how many SMC treatments were received, such as:[76]
    - "Do you know how many days should the child be given the drugs?"
    - "What type of drug was given out?"
    - "Do you know the recommended method to crush the tablets?"

- "In your opinion, how many children under five in this community have taken the medicine that prevents malaria during the rainy season?"
- "Did (NAME) take / swallow the drugs on day 2 and day 3 at home?"

  Generally, the greater of the number of treatments noted on the SMC card or reported by the caregiver is recorded as the number of treatments the child received.[77]

- Starting in 2017, coverage survey data, which is entered on tablets, is expected to be linked to GPS location data.[78]
- Survey team supervisors are instructed to repeat some interviews to ensure that interviewers are administering the survey questionnaires properly,[79] and Malaria Consortium told us that an audit of data quality in Chad was previously planned but was cancelled because the auditors were unable to find sufficient high quality records.[80]

We are unsure how accurately caregivers (and CHWs) are recording SMC doses on the SMC Record Cards.[81] However, it may be that more reliable methods would be infeasible to implement at this scale.[82] In 2017, at least some coverage surveys also gathered data on the proportion of caregivers who had retained the blister pack that contained the SMC medicines; in the examples we've seen, most caregivers did not retain the blister packs.[83]

ACCESS-SMC results (2015-2017)

We have seen headline coverage survey results from all seven ACCESS-SMC countries for 2015 and 2016. A weighted average of these surveys finds that about 91% of children received at least one month of SMC treatment, about 69% received three months of treatment, and about 51% received all four months of treatment. We have also seen some early results from 2017 for Burkina Faso (first two cycles), Nigeria (first cycle), and Chad (first cycle).

Results are summarized in **this spreadsheet**, sheet "Coverage."

Malaria Consortium notes that, to put these results in context, "at each cycle, a child may not receive SMC, if they have malaria or are very sick at the time of the distribution, even though they are seen by the SMC health worker or community drug distributor. And at each cycle there is a chance that a child may miss SMC if they are away from the home (where SMC is delivered door-to-door) or are unable to attend at the SMC distribution point. 88% of children received an SMC card, generally issued at the first cycle. If the probability of receiving SMC at each cycle is 88%, the expected percentage who would receive at least three treatments is [67%], and the

expected percentage who would receive four treatments is 60%."[84] LSHTM estimated that less than 5% of children are excluded due to illness each cycle.[85]

The fact that surveys identified relatively low coverage in some cases increases our confidence in their reliability.

We have not yet seen results from ACCESS-SMC countries on many of the other questions listed in the **ACCESS-SMC, Questionnaire for SMC coverage survey**, such as what type of drug was given out and whether caregivers knew the recommended method to administer the drugs. Malaria Consortium told us that it will be able to share results from these other questions in the future.[86]

Northern Nigeria methodology and results

We have not carefully reviewed the methodology of Malaria Consortium's surveys in northern Nigeria, but they appear to be broadly similar to its ACCESS-SMC surveys, primarily relying on information from SMC cards and asking caregivers to recall the number of treatments given if the card is not available.[87] It conducted its survey in a random sample of about 750 households in two of the four LGAs where it delivered SMC in northern Nigeria in 2014.[88] This survey appears to have been done by Malaria Consortium (not LSHTM, which did the ACCESS-SMC surveys).

Its survey found that about 84% of children surveyed received at least one dose of SMC and that about 62% of children surveyed received at least 3 doses of SMC.[89] It also found that about 86% of caregivers surveyed knew that 2 types of drug were given, 67% said that the first dose was directly observed by CHWs, and 86% correctly stated that doses should be given for each of 2 days after the first dose.[90]

Have malaria rates decreased in targeted populations?

ACCESS-SMC

The only monitoring we have seen so far from ACCESS-SMC programs on changes in the incidence of malaria is preliminary data on malaria deaths based on health management information system (HMIS) data from Burkina Faso and the Gambia, which suggests large decreases in malaria deaths among children under 5 years old following implementation of SMC. For Burkina Faso, there were also large decreases in areas without SMC, which Malaria

Consortium suggests was due to the introduction of free treatment in 2016.[91] We have not seen additional information on the sources for and analysis of this data, and therefore have not vetted this result. We expect further results from monitoring of malaria cases and deaths at health facilities in ACCESS-SMC countries in 2018 (we previously expected these results in 2017, but they have been delayed). Malaria Consortium told us that data is being collected from national HMISs and sentinel sites.[92]

Malaria Consortium also shared case-control studies designed to measure the efficacy of SMC treatments from each ACCESS-SMC country. We have not yet vetted the methodology (some details in the footnote).[93] Malaria Consortium's conclusion from these studies is, "These results confirm that efficacy is as high in SMC programmes as was seen in clinical trials. The results also showed that efficacy falls off rapidly beyond 5-6 weeks after treatment, as expected."[94]

Northern Nigeria (2012-2014)

We have seen three types of analyses of the impact of Malaria Consortium's northern Nigeria program on malaria indicators. These results seem to be consistent with the impacts of SMC found in randomized controlled trials of the program, but due to our remaining questions about the studies we do not yet see them as strong *additional* evidence for the impact of SMC programs. See our **previous review of Malaria Consortium** for more details on this study.

Are there any negative or offsetting impacts?

- **Drug resistance**: Mass-delivery of SMC medicines could contribute to increased drug resistance. In 2015, ACCESS-SMC funded a baseline study of the prevalence of gene mutations in malaria parasites that are markers of drug resistance for the drugs used in SMC.[95] "The baseline surveys, before scale-up of SMC, showed very low frequencies of mutations associated with SP and AQ resistant genotypes."[96] A second survey is planned for 2017, following two rounds of SMC, and Malaria Consortium would like to fund subsequent surveys, if it has the funding to do so.[97]
- **Possible "rebound" effects**: There is a potential concern that SMC could reduce the natural development of immunity to malaria so that after children turn five years old, and are no longer eligible to receive SMC, or if SMC programs are interrupted by lack of funding or other problems, they could lack immunity and be more susceptible to malaria. We have not yet investigated this concern in-depth. Malaria Consortium notes that it will attempt to

monitor malaria rebound in older children through sentinel site studies, if it receives the funding to do so;[98] we have not yet seen sentinel site data.

- **Side effects of SMC drugs**: Our impression is that the most common reaction seen with SMC drugs in earlier programs was vomiting (AQ is bitter and hard to swallow if not crushed into a powder and mixed with water); more recently, AQ has been available as an orange-flavored dispersible.[99] We do not have a strong sense of how common this is, though Malaria Consortium notes that it is no longer a common problem.[100] Also, children are supposed to take the SMC drugs again within 30 minutes if they expel the drugs; we are unsure whether caregivers typically request extra drugs from CHWs when this happens to ensure their child gets a full treatment regimen. Our impression is that other side effects from these drugs are rare and include diarrhea, itching, headache, mild abdominal pain, and rash.[101] A study in Nigeria that followed up with 10,000 SMC recipients one week after receiving SMC to ask about adverse events resulted in only five reports of adverse events, though Malaria Consortium believes there may have been reluctance to report issues.[102] Malaria Consortium shared three resources that report very low severe adverse event rates from SMC drugs (available in the following footnote).[103] We have not yet reviewed these.
- **Drug quality and dosage**: Malaria Consortium told us that it is only permitted to procure products from suppliers that meet WHO guidelines for pre-qualification quality assurance standards.[104] We have not yet asked Malaria Consortium for the details of this process. If there were issues with drug quality or dosage, it could reduce the effectiveness of the intervention and lead to more rapid development of drug resistance.

What do you get for your dollar?

Cost per SMC treatment

In order to make program costs comparable across all of our top charities, we aim to estimate the total cost to all actors of supporting a given program. Our estimate of cost-per-treatment for SMC includes research costs, start-up costs, and costs incurred by actors such as governments. Our estimates also rely on coverage survey estimates to approximate the number of people reached rather than administrative coverage estimates. With these assumptions, we estimate that the total cost to achieve the equivalent of four person-months of SMC coverage is about $6.80. Full details in **this spreadsheet**.

We start with this total cost figure and apply adjustments in our cost-effectiveness analysis to account for cases where we believe the charity's funds have caused other actors to shift funds from a less cost-effective use to a more cost-effective use ("leverage") or from a more cost-effective use to a less cost-effective use ("funging").

Cost-effectiveness

SMC programs appear to be in the range of cost-effectiveness of our other **priority programs**. See our most recent **cost-effectiveness model** for estimates of the cost per life saved through Malaria Consortium-supported SMC programs and how our model compares this outcome with outcomes of other programs.

Note that our cost-effectiveness analyses are simplified models that do not take into account a number of factors. For example, our model does not include the short-term impact of non-fatal cases of malaria prevented. It also does not include possible **offsetting impacts** or other harms.[105]

There are limitations to this kind of cost-effectiveness analysis, and we believe that **cost-effectiveness estimates such as these should not be taken literally**, due to the significant uncertainty around them. We provide these estimates (a) for comparative purposes and (b) because working on them helps us ensure that we are thinking through as many of the relevant issues as possible.

Is there room for more funding?

We believe that Malaria Consortium could productively use more funding than it expects to receive to scale up its SMC activities.

In short:

- **Estimated needs:** There are several large funders (the Global Fund to Fight AIDS, Tuberculosis and Malaria, and the US and UK governments) who are expected to fund some SMC programs in 2018-2020. Malaria Consortium expects a large funding gap to remain after these other funders are accounted for. Malaria Consortium estimates that it could spend $28-30 million per year on SMC in each of the next three years and that this level of funding would largely fill the funding gap for SMC, with the exception of Nigeria, where the scale of the gap would be beyond Malaria Consortium's operational capacity in the short term. There is uncertainty around the size of the gap because other funders have not yet made all of their commitments, but our understanding is that there is little uncertainty that there will remain a large (in the tens of millions of dollars) gap over the next three years. Malaria Consortium would use funding to reach additional children in four countries: Nigeria, Chad, Burkina Faso, and Guinea Bissau. (**More**)
- **Cash on hand:** Malaria Consortium expects to have very little funding available for SMC in 2018. Its prior major source of funding for SMC, the ACCESS-SMC grant, is ending in February 2018 and will not fund treatments in 2018, and Malaria Consortium told us that it will not be renewed. It will likely have a small amount (~$200,000-$350,000) of GiveWell-directed funding remaining from previous grants for 2018. (**More**)
- **Other sources of funds:** Malaria Consortium told us that it has approached a number of other funders about SMC and that it does not expect such conversations to lead to a major change in its room for more funding in 2018. We have more uncertainty about what these other funders are likely to contribute to SMC programs in 2019 and 2020. (**More**)
- **Additional considerations:** Malaria Consortium works on a wide variety of programs. We have asked Malaria Consortium to use any GiveWell-influenced donations to specifically support SMC programs. (**More**)

December 2017 update: In November 2017, we recommended that Good Ventures give $27.9 million to Malaria Consortium. After accounting for this grant, we expect that Malaria

Consortium will continue to have a funding gap for 2018-2020 on the order of tens of millions of dollars.

Available and expected funds

ACCESS-SMC, funded by Unitaid and the primary source of Malaria Consortium's SMC funding in 2015-2017, is ending in February 2018 and will not cover any treatments in 2018. The grant was originally set to cover SMC treatments in 2015 and 2016 and was extended to continuing supporting treatments in some countries in 2017.[106] Malaria Consortium told us that funding from Unitaid will not be renewed because part of its strategy is to provide catalytic funding for relatively new programs (such as SMC) to prove that they work at a large scale, with the goal of having other large funders (and/or domestic resources) fill the gaps for those programs in the future.[107] We have not yet spoken with Unitaid about its thinking.

As noted above, Malaria Consortium seems not to have allocated much unrestricted funding to its SMC programs in the past.[108]

Malaria Consortium's estimate of a $28-30 million per year funding gap for SMC makes certain assumptions about what funding will be available from the US government's President's Malaria Initiative (PMI), the World Bank, and the Global Fund. These major funders have indicated they will fund SMC (or in the case of the Global Fund, countries have indicated in what areas they will use funding from the Global Fund to fund SMC). The total funding gap for SMC could be larger or smaller if these major funders change their plans.

Malaria Consortium told us that, in addition, it has sought funding for SMC from several other sources, including local governments and private corporations in Nigeria and Chad.[109]

We estimate that Malaria Consortium will have about $200,000-$350,000 in GiveWell-directed funds at the end of 2017 (before any funding due to our 2017 recommendations).[110]

More detail in **this spreadsheet**, see the sheet "Available and expected funding."

Uses of additional funding

Malaria Consortium estimates it could spend $28-30 million per year in the next three years to deliver SMC.

If it had sufficient funding to do so, Malaria Consortium would deliver SMC in four countries: Nigeria, Burkina Faso, Chad, and Guinea-Bissau. As of August 2017, it was Malaria Consortium's understanding that SMC-eligible areas in other countries were likely to be fully covered by other funders, with the exception of Niger where significant gaps are likely to exist, but Malaria Consortium has found it difficult to obtain concrete information on the scope of these gaps.[111]

More detail in **this spreadsheet**, see the sheet "spending opportunities."

GiveWell's prioritization of Malaria Consortium's SMC funding gaps

Malaria Consortium, through the ACCESS-SMC program, has demonstrated that it has the capacity to manage a large-scale program with reasonably high-quality monitoring. With the exception of Guinea-Bissau, it has previously implemented SMC in the countries it is seeking funding for. We would guess that funding, rather than other bottlenecks, will be the limiting factor on how much of the global funding gap for SMC Malaria Consortium can fill.

Note that for our room for more funding analysis we ask top charities for rough estimates of their ideal budgets for the next two to three years. GiveWell-directed funding can fluctuate a lot year to year and so our preference is for the organizations we direct funding to to treat the funding as a multi-year grant to help smooth funding year-to-year and allow for longer-term planning.

The main risk we see to funding Malaria Consortium at close to the $86.4 million it believes it could absorb is the possibility that other funders fill more of the gap than expected. Malaria Consortium told us that other funders are very unlikely to commit substantially more resources in the next couple of years.[112]

We believe it is highly unlikely that Malaria Consortium will receive more than $86 million for SMC, but if it did, we expect it would use the funds to fill any unanticipated gaps and to fund the program into 2021 and beyond.

Additional considerations relevant to assessing Malaria Consortium's room for more funding

- **Lack of drug supply**: Malaria Consortium told us that in 2015 ACCESS-SMC was limited to purchasing about 15 million treatments due to lack of supply of SMC drugs.[113] In 2016, supply substantially expanded and ACCESS-SMC said it was able to purchase about 30 million treatments (and that it was not constrained by lack of drug supply).[114] In 2017, Malaria Consortium told us that supply had expanded and it did not expect drug supplies to be a limiting factor in the future, though limits in drug production capacity continued to mean that drugs need to be ordered by early in the year to ensure delivery by the start of the SMC season.[115]
- **Timeline of distributions**: Malaria Consortium told us that it generally needs about 6-7 months to plan a SMC distribution after it has received official confirmation of funding for the distribution.[116] In December 2016, we told Malaria Consortium that we were recommending that Good Ventures make a $5 million grant for the SMC program and Malaria Consortium received these funds in February 2017. It used a portion of this funding to purchase drugs and deliver treatments in the 2017 rainy season (roughly June to September).[117] This may not be indicative of the timeline that would be needed for delivering a larger number of treatments.
- **Ability to scale**: One reason that we believe that Malaria Consortium could likely use a large amount of additional funds relatively quickly is that it supported the scale-up of ACCESS-SMC, which delivered over 50 million treatments in 2015-2017.[118]
- **Fungibility**: Since Malaria Consortium works on a variety of programs, it is possible that receiving additional funds for its SMC work could lead it to reallocate unrestricted funds or other organizational resources (such as time spent fundraising) toward other programs, so that additional dollars donated to Malaria Consortium would not fully support additional SMC work. However, as discussed above, we do not see this as a major concern because we do not believe that Malaria Consortium has substantial unrestricted funding available, and it

seems that Malaria Consortium has not allocated substantial unrestricted funding to SMC work in the past.[119]

Global need for treatment

Malaria Consortium has told us that there is a large funding gap for SMC, which it has worked, unsuccessfully, to close through organizing stakeholders meetings in 2016 and 2017.[120] Additional information on the size of the global funding gap for SMC:

- Malaria Consortium shared a summary of donor commitments to SMC, as of October 2017, for the years 2016 to 2020. ACCESS-SMC (Unitaid) funded SMC in 139 districts in 2016 and 82 in 2017; it is not expected to fund SMC in 2018-2020. Increased funding from the Global Fund for SMC in 2017 more than offset the decrease from ACCESS-SMC overall and, specifically, offset or more than offset the decrease in Guinea, Mali, Niger, the Gambia, and Chad; coverage in Burkina Faso and Nigeria is expected to fall in 2018 as ACCESS-SMC funding ends and less funding is available from the Global Fund than was available from ACCESS-SMC. With the end of ACCESS-SMC in 2017, the number of unfunded districts is expected to grow in 2018. In total, there are donor commitments for 32% of eligible districts for 2018, whereas 47% of districts were covered in 2017. It is possible that additional commitments will be made, though we note that commitments for 2018 from each of the three largest SMC donors (Global Fund, World Bank, and PMI) already exceed their 2017 levels.[121]
- WHO estimates that about 23.7 million children are eligible for SMC, in areas of highly seasonal transmission across the Sahel sub-region of Africa.[122]
- ACCESS-SMC estimated that in the seven countries in which it was working in 2016, about 54% of eligible children would not be reached and the total cost of filling the unmet need for 2016 was approximately $49 million.[123] We have not vetted this estimate.
- As of August 2017, it was Malaria Consortium's understanding that minimal funding gaps for SMC in SMC-eligible districts were expected in the next couple of years in Cameroon, Ghana, Guinea, Mali, The Gambia, Togo, and, less certainly, in Niger.[124] It believed that funding gaps remained for Nigeria, Burkina Faso, Chad, and Guinea-Bissau (see above).
- Malaria Consortium told us that it is hopeful that in the longer term the Global Fund will be able to fully fund SMC in all countries that need it, but that this is unlikely to happen soon and that country governments need to be convinced of the value of SMC to prioritize using

Global Fund funding to support it.[125] Malaria Consortium told us that it believes an important part of its role is collecting evidence and operational knowledge that could persuade governments and other funders to support SMC in the future.[126] ACCESS-SMC countries allocated Global Fund funding to SMC to cover 80 districts in 2017 and 92 in 2018, up from 5 in 2016.[127] Malaria Consortium notes that districts funded with Global Fund funding may not be the same districts that were reached by ACCESS-SMC.[128]

- It is possible that limited drug supply or other non-monetary bottlenecks, such as inadequate distribution system capacity or lack of government prioritization of the program, could limit the scale-up of SMC in the future.[129]
- In November 2017 we asked Melanie Renshaw of ALMA for updates on the size of the funding gap. Dr. Renshaw shared preliminary data from Roll Back Malaria Partnership (RBM) on the size of funding gaps for SMC commodities in eligible countries (data for four countries, the Gambia, Mali, Mauritania, and Senegal were not yet available). RBM's country estimates indicated that there are funding gaps in each 2018, 2019, and 2020 in Chad and Nigeria, and a gap in Burkina Faso in 2020 but not in 2018 or 2019.[130] We do not know why this estimate differs from Malaria Consortium's estimate.

Malaria Consortium as an organization

We added Malaria Consortium to our list of top charities in 2016. We have spent less time investigating Malaria Consortium and have less insight into its activities and track record than we do for **top charities** which we have followed for many years.

- **Track record:** Malaria Consortium has experience with supporting large-scale SMC programs, particularly through its work on ACCESS-SMC. It has not yet produced all of the types of monitoring and research that it has said it will for ACCESS-SMC.
- **Self-evaluation:** Malaria Consortium's self-evaluation is strong compared to the vast majority of organizations we have considered.
- **Communication:** To date, Malaria Consortium has generally communicated clearly with us.
- **Transparency:** Malaria Consortium is transparent. It has allowed us to publish most of the information it has shared with us.

More on how we think about evaluating organizations at our **2012 blog post**.

Sources

Document	Source
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ACCESS-SMC M&E strategy, November 2015	**Source**
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1.

- We had one conversation with Malaria Consortium staff in each of January, February, and March, 2016.
- **GiveWell's non-verbatim summary of a conversation with Malaria Consortium Staff, August 25, 2016**.
- **GiveWell's non-verbatim summary of conversations with Malaria Consortium staff, November 7 and November 9, 2016**.
- **GiveWell's non-verbatim summary of a conversation with Malaria Consortium Staff, November 23, 2016**.
- **GiveWell's non-verbatim summary of a conversation with Malaria Consortium staff, January 18, 2017**.
- **GiveWell's non-verbatim summary of a conversation with Malaria Consortium staff, January 19, 2017**.
- **GiveWell's non-verbatim summary of a conversation with Malaria Consortium staff, March 24, 2017**.
- **GiveWell's non-verbatim summary of a conversation with Diego Moroso, April 25, 2017**.
- We have had some additional conversations with Malaria Consortium for which we did not produce conversation notes.

2.

GiveWell's non-verbatim summary of a conversation with Paul Milligan and Diego Moroso, August 2, 2017

3.

"Established in 2003, Malaria Consortium is one of the world's leading non-profit organisations specialising in the prevention, control and treatment of malaria and other communicable diseases among vulnerable populations.

Our mission is to improve lives in Africa and Asia through sustainable, evidence-based programmes that combat targeted diseases and promote child and maternal health." **Malaria Consortium website, "Who We Are"**.

4.

"Established in 2003, Malaria Consortium is one of the world's leading non-profit organisations specialising in the prevention, control and treatment of malaria and other communicable diseases among vulnerable populations.

...With 95 percent of our staff working in malaria endemic areas, we currently have programmes and projects in 12 countries across Africa and Southeast Asia. Our local insight, embedded technical expertise and practical skills give us the agility to respond to critical challenges quickly and effectively." **Malaria Consortium website, "Who We Are"**.

5.

- Malaria Consortium spent about 50,840,000 British pounds from April 1, 2016 to March 31, 2017. See **Malaria Consortium, Trustees' report and financial statements 2017**, "Total expenditure" "for the year ended 31 March 2017", Pg 17.
- We used X-RATES to find the USD to GBP as of March 31, 2017: 1.253.
- Percentage of spending coming from restricted funds calculation: 44,940,000 British pounds / 50,840,000 British pounds = 0.88. See "Total expenditure" from 2016) and compare "Restricted funds" and "Total funds" columns on Pg 16.
- See also **Malaria Consortium, restricted and unrestricted expenditure analysis 2016**.

6.

"In March 2012, the World Health Organisation (WHO) issued a policy recommendation for a new intervention against Plasmodium falciparum malaria - seasonal malaria chemoprevention (SMC), previously referred to as intermittent preventive treatment in children (IPTc), in children under five years old. SMC is defined as the intermittent administration of full treatment courses of an anti-malarial treatment combination during the malaria season to prevent illness and death from the disease.

The objective is to maintain therapeutic anti-malarial drug concentrations in the blood throughout the period of greatest risk. This will reduce the incidence of both simple and severe malaria disease and the associated anaemia and result in healthier, stronger children able to develop and grow without the interruption of disease episodes. SMC has been shown to be effective, cost effective and feasible for the prevention of malaria among children in areas where the malaria transmission season is no longer than four months." **Malaria Consortium website, "Seasonal Malaria Chemoprevention"**.

7. **World Health Organization, "Seasonal Malaria Chemoprevention"**.

8. **World Health Organization, "Seasonal Malaria Chemoprevention: A Field Guide"**, Pg 7.

9. **World Health Organization, "Seasonal Malaria Chemoprevention: A Field Guide"**, Pg 7.

10. **World Health Organization, "Seasonal Malaria Chemoprevention: A Field Guide"**, Pg 8.

11. **World Health Organization, "Seasonal Malaria Chemoprevention: A Field Guide"**, Pg 9. Malaria Consortium provided the edit to the quotation in response to a draft of this page in October 2017.

12. "How is SMC delivered?
Local announcements each month will inform the community about the date of SMC, which will be delivered by community health workers at pre-arranged locations in the community, or by visiting each household. Health workers will receive appropriate training before the intervention begins and will be supervised by nurses and the district health team."**ACCESS-SMC project brochure**, Pg 3. Malaria Consortium noted that health workers are also sometimes trained for SMC programs (comment provided in response to a draft of this page in October 2017).

13.
- For Malaria Consortium's SMC program in Nigeria: "House to house delivery method was the most used approach, as reported by 88.2 percent of the respondents. This was similar across the LGAs [local government areas] though Maiadua had slightly higher numbers receiving through the fixed point delivery approach. The duration spent in receipt of drugs in the home was 20 minutes, half the time spent in receipt of drugs from a fixed point which was 47 minutes. Knowledge of the different types of SMC drugs and dose duration was high at over 80 percent. This highlights house to house delivery of SMC as a quicker and most preferred delivery mechanism by the caregivers. There is need for costing the two delivery mechanisms to assess if home based delivery still remains a cost effective delivery channel." **Malaria Consortium, Nigeria SMC evaluation report, 2014**, Pg 38.
- For ACCESS-SMC delivery methods, see the annexes on Pgs 31-70 of **ACCESS-SMC multi-country cost analysis, January 2017**. Sample quote: "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." **ACCESS-SMC multi-country cost analysis, January 2017**, Pg 31.

14.
- **GiveWell's non-verbatim summary of conversations with Malaria Consortium staff, November 7 and November 9, 2016**.
- In response to this review, Malaria Consortium noted that “In most cases this is true. However, due to the number of CDDs/CHWs required to implement SMC we have had to recruit and train other community volunteers who only provide SMC services.” **Malaria Consortium emails (unpublished), November 23, 2016**.
- Comments from Malaria Consortium in response to a draft of this page in October 2017.

15. **Malaria Consortium emails (unpublished), November 23, 2016**.
Comments from Malaria Consortium in response to a draft of this page in October 2017.

16.

Note from Malaria Consortium provided in response to a draft of this page in October 2017.

17.

See Figure 1, Pg 8, **Malaria Consortium, "Seasonal Malaria Chemoprevention Programme Start-Up Guide, Nigeria"**

18.

Malaria Consortium emails (unpublished), November 23, 2016.

19.

Comments from Malaria Consortium in response to a draft of this page in October 2017

20.

- See Figure 1, Pg 8, **Malaria Consortium, "Seasonal Malaria Chemoprevention Programme Start-Up Guide, Nigeria"**. "DOT" stands for "Directly Observed Treatment".
- "How long should the Role Model Caregiver observe each child after giving SMC medicines? a) 10 minutes, b) 15 minutes, c) 30 minutes, d) 1 hour, [Correct answer: C]" **Malaria Consortium Quiz Answer Key**.

21.

- See Figure 1, Pg 8, **Malaria Consortium, "Seasonal Malaria Chemoprevention Programme Start-Up Guide, Nigeria"**. "DOT" stands for "Directly Observed Treatment".
- "How long should the Role Model Caregiver observe each child after giving SMC medicines? a) 10 minutes, b) 15 minutes, c) 30 minutes, d) 1 hour, [Correct answer: C]" **Malaria Consortium Quiz Answer Key**.
- "What should the Role Model Caregiver advise the child's caregiver after giving the first dose of the SMC medicines? a) When to take the second and third dose of Amodiaquine (AQ) at home, b) The importance of adherence to giving the two doses of Amodiaquine (AQ) home, c) What to do if the child vomits, d) How to mark the SMC Record Card after giving each dose and to bring the card back for the next SMC cycle, e) When to go to the health facility if the child gets a fever or very sick, f) All of above, [Correct Answer: F.]" **Malaria Consortium Quiz Answer Key**.
- "The child's SMC Record Card is very important because: a) It shows the Role Model Caregiver the name and register number of the child, b) The child's caregiver should always take it with them if they need to go to the health facility, c) It shows how many times the child received the SMC medicines each month, d) It is made of thick paper and is in a plastic packet, e) a, b and c, f) All of the above, [Correct answer: E.]" **Malaria Consortium Quiz Answer Key**.

22.

- "The child's SMC Record Card is very important because: a) It shows the Role Model Caregiver the name and register number of the child, b) The child's caregiver should always take it with them if they need to go to the health facility, c) It shows how many times the child received the SMC medicines each month, d) It is made of thick paper and is in a plastic packet, e) a, b and c, f) All of the above, [Correct answer: E.]" **Malaria Consortium Quiz Answer Key**.
- We have seen a few versions of templates for "SMC Record Cards." The latest version that we have seen (from 2016) is here: **SMC Record Card Template 2016**.

23.

- See Figure 1, Pg 8, **Malaria Consortium, "Seasonal Malaria Chemoprevention Programme Start-Up Guide, Nigeria"**. "DOT" stands for "Directly Observed Treatment".
- "How long should the Role Model Caregiver observe each child after giving SMC medicines? a) 10 minutes, b) 15 minutes, c) 30 minutes, d) 1 hour, [Correct answer: C]" **Malaria Consortium Quiz Answer Key**.
- "What should the Role Model Caregiver advise the child's caregiver after giving the first dose of the SMC medicines? a) When to take the second and third dose of Amodiaquine (AQ) at home, b) The importance of adherence to giving the two doses of Amodiaquine (AQ) home, c) What to do if the child vomits, d) How to mark the SMC Record Card after giving each dose and to bring the card back for the next SMC cycle, e) When to go to the health facility if the child gets a fever or very sick, f) All of above, [Correct Answer: F.]" **Malaria Consortium Quiz Answer Key**.

- Malaria Consortium told us that caregivers are able to visit CHWs to request additional treatments if their child vomits. **GiveWell's non-verbatim summary of conversations with Malaria Consortium staff, November 7 and November 9, 2016**.

24.

See Figure 1, Pg 8, **Malaria Consortium, "Seasonal Malaria Chemoprevention Programme Start-Up Guide, Nigeria"**.

25.

- "Who should NOT get SMC medicines? a) Any child with a fever or who is severely ill, b) Any child who is currently taking a sulfa medication such as co-trimoxazole (Septrin, or Bactrim), c) A child who has received a dose of either Amodiaquine (AQ) and sulfadoxine / pyrimethamine (SP) during the past month, d) A child who is allergic to sulfa medication such as co-trimoxazole, Septrin, or Bactrim, e) A child who is allergic to either Amodiaquine (AQ) and sulfadoxine / pyrimethamine (SP), f) a,b,ande, g) All of the above. [Correct answer is G.]" **Malaria Consortium Quiz Answer Key**.
- "What important questions must the Role Model Caregiver ask about each child before giving SMC medicines? a) The child's age, b) If the child has taken any medicines in the past 28 days, and which ones, c) If the child has any allergies, d) If the child has a fever or is sick, e) a, b, and d, f) All of the above, [Correct answer is F.]" **Malaria Consortium Quiz Answer Key**.
- "What should the Role Model Caregiver do if a child has a fever on the day SMC medicines are being given? a) Complete the SMC Referral Form, b) Refer the child to the nearest health facility for a malaria test, c) Complete the SMC Register with the reason for the referral, d) Give the child Coartem, e) Give the child the SMC medicines to treat the fever, f) a, b, and c, g) All of the above, [Correct answer is F.]" **Malaria Consortium Quiz Answer Key**.

26.

Malaria Consortium emails (unpublished), November 23, 2016.
Comments from Malaria Consortium in response to a draft of this page in October 2017.

27.

Comments from Malaria Consortium in response to a draft of this page in October 2017.

28.

- "SMC medicines come in two colour packets for different age children. What age group should get the medicines in the YELLOW packets? ... [correct answer:] b) 3 to 12 months " **Malaria Consortium Quiz Answer Key**.
- "SMC medicines come in two colour packets for different age children. What age group should get the medicines in the BLUE packets? ... [correct answer:] b) 12 to 59 months" **Malaria Consortium Quiz Answer Key**.

29.

"Determining a child's age
1. Ask the caregiver how old the child is.
2. Ask to see the child's vaccination card.
3. If the caregiver does not know the child's age or does not have a vaccination card; ask the caregiver to describe the events when the child was born. (Dry or rainy season, religious celebrations such as Eid or Ramadan, political, or social events).
4. Look for 1 or more of the following milestones for appropriate age category:
Most infants younger than 3 months will not be able to:
– Hold their head and neck steady when being held upright
– Push down with their legs when their feet are on a hard surface
– Grab an object in their hand and bring it to their mouth
Most children 1 year or older should be able to:
– Sit without help
– Pull themselves up to standing using a chair or caregiver's hand
– Stand on their own or take a few steps
Most children who are older than 5 years should be able to:
– Raise their arm over their head to touch their opposite ear
– Stand on one foot for 10 seconds or longer
– Hop on one foot"'

30.

"Malaria Consortium notes that there are several layers of supervision that provide spot-check control of how well the administration process is followed:

- There is in general a “proximity supervisory team” (CHWs with higher education or literacy skills / experience or a junior health worker) who follow a number of distribution teams (for instance, in Burkina Faso it’s 1 for every 5 CHW teams, in Nigeria, 1 for every 3 community drug distributor (CDD) teams). They work 3 to 4 days per cycle.
- Health workers from one health facility carry out spot-check corrective supervision over all CDDs/CHWs and all supervisors in their catchment area; they work 3 to 4 days per cycle.
- District health officials carry out supervisory visits over both distributors (to check quality of administration) and supervisors (to check on the quality / frequency of supervision). They work 3 to 4 days per cycle.
- Regional health officials carry supervisory spot-check visits over all the levels below, to check on the quality of administration and of supervision and provide corrective guidance. They work 2 to 4 days per cycle.
- National Malaria Control Program (NMCP) supervisors carry out supervisory spot-check visits over all the levels below (as above). They work 3 to 4 days per cycle.
- Malaria Consortium and partner’s country supervisors / teams carry out spot-check visits (independently or jointly with health authorities, as above). They work 4 days per cycle on supervision and implementation monitoring.
- AfRO Malaria Consortium and partner staff carry out regular country field visits including spot-check supervision to control all of the above. About 2 visits per country during the SMC round at minimum.

The system is quite extensive and well-rehearsed, since it is used across several child survival, mass prevention campaigns. While it is likely that there will be some mistakes at this scale (in particular, age misclassification and eligibility are common issues for all mass campaigns, with no easy, inexpensive solutions around it), major mistakes in administration are likely to be caught. While these have not been quantified, in nearly 10,000 estimated instances of spot-check supervision across the region, anecdotal instances of reported gross negligence in administration of drugs, that could be identified in 2015, were within the hundreds, and promptly corrected: these mostly related to lack of observation of hygiene practices, excessive use of water, ignoring directly observed therapy (DOT) protocols, severe age misclassification, non-respect of observation time, and premature administration of second DOT after vomiting. Most of the other problems identified were, instead, around appropriate administration record-keeping, due to low literacy levels of volunteers in many countries. Please mind that no other mass campaign outside operational research is known to keep detailed individual records of recipients. In most mass campaigns that are known to be safe and effective (measles, polio, pneumonia, vitamin A, deworming, NTD MDAs, just to name a few), only simple tally sheets and sample in-process monitoring are used. Due to the research needs of a new intervention, SMC is being held to extremely high accountability standards as compared to other interventions. It is unlikely that individualized records and these layered levels of supervision are sustainable in the long term and/or at an increased scope, because of the implication on resources needed and costs to local budgets." **Malaria Consortium emails (unpublished), November 23, 2016**.

31.

Malaria Consortium emails (unpublished), November 23, 2016.

32.

- "Budget: 1,694,339.00 (USD)" **Malaria Consortium, "Support Scale up of Seasonal Malaria Chemoprevention (SMC)"**. We also searched the Gates Foundation's grant database to see whether it made any additional grants to Malaria Consortium for SMC work, but only saw this grant (grant page available at **Gates Foundation, "Malaria Consortium"**).
- "Malaria Consortium is implementing and assessing the feasibility of a community-based seasonal malaria chemoprevention (SMC) project in Katsina state, northern Nigeria, with funding from the Bill & Melinda Gates Foundation. Following new World Health Organisation policy recommendations on SMC, this project administers full antimalarial treatments during the malaria season in areas with highly seasonal malaria transmission, to prevent illness among children under five." **Malaria Consortium, Project Brief: Seasonal malaria chemoprevention, Katsina**, Pg 1.
- "The project’s objectives are:

- To design, in consultation with key local stakeholders, an appropriate community-based delivery system for SMC in Katsina state based on formative research, which will review aspects relating to feasibility, community acceptability, effectiveness and cost
- To launch and execute SMC delivery according to the selected delivery system and collect data on process indicators and costs
- To evaluate community acceptability, costs and effectiveness of the delivery system for SMC
- To inform future national and state plans for SMC continuation/ scale up by disseminating findings and sharing experiences with key stakeholders" **Malaria Consortium, Project Brief: Seasonal malaria chemoprevention, Katsina**, Pg 2.

- It appears that this project may have also been related to another major (£89 million) project that Malaria Consortium was working on in Nigeria called "Support to National Malaria Programme (SuNMaP)".
  - "Support to National Malaria Programme (SuNMaP) is an £89 million UK aid funded project that works with the government and people of Nigeria to strengthen the national effort to control malaria. The programme began in April 2008 and [ended] in March 2016.
    Led by Malaria Consortium, SuNMaP was jointly managed by a consortium, including lead partners Health Partners International and GRID Consulting, with nine other implementing partners. SuNMaP was implemented in 10 states across Nigeria, including Anambra, Kano, Niger, Katsina, Ogun, Lagos, Jigawa, Enugu, Kaduna and Yobe.
    SuNMaP worked with the Nigerian government's National Malaria Elimination Programme (NMEP) to harmonise donor efforts and funding agencies around national policies and plans for malaria control. Project targets were aligned with the National Malaria Strategic Plan and Global Malaria Action Plan. The project aimed to improve national, state and local government level capacity for the prevention and treatment of malaria." **Malaria Consortium, SuNMaP Final Report**, Pg 38.

  - "July 2013: Result of SuNMaP study on efficacy of sulphadoxine-pyrimethamine (SP) for intermittent treatment against malaria in pregnancy published. SuNMaP commences seasonal malaria chemoprevention in Katsina State." **Malaria Consortium, SuNMaP Final Report**, Pg 16.

33.

- **Malaria Consortium emails (unpublished), November 23, 2016**.
- "Length of project: 2012-2014 (33 months)," **Malaria Consortium, Project Brief: Seasonal malaria chemoprevention, Katsina**, Pg 1.
- "[In 2013], Total number of children covered = 487,354"; "[In 2014], Total number of children covered = 1,112,330," **Cost analysis of the seasonal malaria chemoprevention project in Katsina state, Nigeria**, Pg 20. However, compare to "A total of 487,353 treatment courses were delivered in two LGAs over three treatment cycles in the first round of SMC representing an average of 115% coverage over the three cycles. In 2014, a total of 1,078,440 treatments were provided across four LGAs over four cycles with an average of 115% administrative coverage." **Malaria Consortium, Monitoring and evaluation summary Nigeria**, Pg 2. Our understanding is that about 4 treatments were aimed to be delivered per child, suggesting that about 350,000 to 400,000 children were targeted. (487,354 + 1,112,330) / 4 = 399,921, while (487,353 + 1,078,440) / 4 = 391,448.25.
- "The project also has a number of critical milestones:...85 percent of children targeted receive all courses of SMC in the second round," **Malaria Consortium, Project Brief: Seasonal malaria chemoprevention, Katsina**, Pg 2.
- [Under "Process of implementation 2"]: "Selection and training of 2,500 community caregivers (CHWs) and supervisors to deliver the intervention and complete the necessary forms," Slide 13, **Malaria Consortium, SMC presentation, May 6, 2014**. Note: Malaria Consortium gave us an updated figure of 3,600 CHWs, which is cited above.
- "Intervention area 2013:
  - In consultation with the State MOH and SMCP, four LGAs were chosen
  - Two for implementation of SMC and two for control in 2013

- Full implementation in four LGAs in 2014," Slide 9, **Malaria Consortium, SMC presentation, May 6, 2014**.

34.

- "The project's objectives are: ...To inform future national and state plans for SMC continuation/scale up by disseminating findings and sharing experiences with key stakeholders," **Malaria Consortium, Project Brief: Seasonal malaria chemoprevention, Katsina**, Pg 1.
- **Strachan et al. 2016** Abstract:
  - "Background: Experience of seasonal malaria chemoprevention (SMC) is growing in the Sahel sub-region of Africa, though there remains insufficient evidence to recommend a standard deployment strategy. In 2012, a project was initiated in Katsina state, northern Nigeria, to design an appropriate and effective community-based delivery approach for SMC, in consultation with local stakeholders. Formative research (FR) was conducted locally to explore the potential feasibility and acceptability of SMC and to highlight information gaps and practical considerations to inform the intervention design.
  - Methods: The FR adopted qualitative methods; 36 in-depth interviews and 18 focus group discussions were conducted across 13 target groups active across the health system and within the community. Analysis followed the 'framework' approach. The process for incorporating the FR results into the project design was iterative which was initiated by a week-long 'intervention design' workshop with relevant stakeholders.
  - Results: The FR highlighted both supportive and hindering factors to be considered in the intervention design. Malaria control was identified as a community priority, the community health workers were a trusted resource and the local leadership exerted strong influence over household decisions. However, there were perceived challenges with quality of care at both community and health facility levels, referral linkage and supportive supervision were weak, literacy levels lower than anticipated and there was the potential for suspicion of 'outside' interventions. There was broad consensus across target groups that community-based SMC drug delivery would better enable a high coverage of beneficiaries and potentially garner wider community support. A mixed approach was recommended, including both community fixed-point and household-to-household SMC delivery. The FR findings were used to inform the overall distribution strategy, mechanisms for integration into the health system, capacity building and training approaches, supportive interventions to strengthen the health system, and the social mobilization strategy.
  - Conclusions: Formative research played a valuable role in exploring local socio-cultural contexts and health system realities. Both opportunities and challenges for the introduction of SMC delivery were highlighted, which were appropriately considered in the design of the project."

35.

- "UNITAID has awarded up to $67 million to Malaria Consortium to oversee the largest-yet global programme to increase seasonal malaria chemoprevention (SMC) across the Sahel region of Africa, where malaria remains the leading cause of severe illness and mortality in young children...This grant will help increase capacity and reduce prices for SMC products in the seven target countries and is expected to supply an estimated 30 million treatments every year to protect 7.5 million children, preventing around 50,000 deaths." **Malaria Consortium, ACCESS-SMC announcement, May 8, 2014**.
- "ACCESS-SMC is a UNITAID-funded project, led by Malaria Consortium in partnership with Catholic Relief Services, which is scaling up access to seasonal malaria chemoprevention (SMC) across the Sahel to save children's lives. This three year project is supported by London School of Hygiene & Tropical Medicine, Centre de Support de Santé International, Management Sciences for Health, Medicines for Malaria Venture, and Speak Up Africa. It will provide up to 30 million SMC treatments annually to 10 million children less than five years of age [specifically, children ages 3 to 59 months] in Burkina Faso, Chad, Guinea, Mali, Niger, Nigeria and The Gambia, potentially averting 49,000 deaths due to malaria." **Malaria Consortium, ACCESS-SMC page**.
- "ACCESS-SMC is working with all seven supported National Malaria Control Programs (NMCPs) to create SMC delivery pathways. We are providing support in a range of areas, including planning and management, supply chain, health worker training and communications and social mobilization. The project is also procuring almost 15m doses of SMC drugs in 2015, and up to 30m in 2016. Working together with NMCPs, we will reach 3.3m children in 2015 and up to 6.6m children by 2016 in Burkina Faso, Chad, Guinea, Mali, Niger, Nigeria and The Gambia." **ACCESS-SMC website, "The Project"**.

- Clarifications around number of children targeted annually from **Malaria Consortium emails (unpublished), November 23, 2016**.

36.

"UNITAID has awarded up to $67 million to Malaria Consortium to oversee the largest-yet global programme to increase seasonal malaria chemoprevention (SMC) across the Sahel region of Africa, where malaria remains the leading cause of severe illness and mortality in young children." **Malaria Consortium, ACCESS-SMC announcement, May 8, 2014**.

37.

- "Malaria Consortium's three year project, known as ACCESS SMC, will run across seven African countries: Burkina Faso, Chad, Guinea Conakry, Mali, Niger, Nigeria and The Gambia. ACCESS-SMC will be led by Malaria Consortium, with Catholic Relief Services as the primary sub-grantee. It will be supported by London School of Hygiene & Tropical Medicine, Management Sciences for Health, Medicines for Malaria Venture, Speak Up Africa and Centre de Support en Sante International." **Malaria Consortium, ACCESS-SMC announcement, May 8, 2014**.
- "The ACCESS-SMC partnership:
  - Malaria Consortium is leading the ACCESS-SMC project, tracking its impact, managing the procurement of SMC drugs and supporting malaria control programmes to implement SMC in Burkina Faso, Chad and Nigeria.
  - Catholic Relief Services is the lead-subrecipient and contributing to tracking the reach and impact of the project and supporting malaria control programmes to implement SMC in Guinea, Mali, Niger and The Gambia.
  - London School of Hygiene & Tropical Medicine is generating evidence on drug resistance, strengthening pharmacovigilance and measuring SMC's public health impact.
  - Medicines for Malaria Ventures is supporting manufacturers to develop a child friendly, dispersible formulation and ensuring accurate drug forecasting.
  - Management Sciences for Health is measuring the cost of SMC and working with countries to optimize the SMC supply chain.
  - Speak Up Africa is creating an integrated health communications and advocacy campaign. The complementary nature of the partnership, which includes non-profit and academic institutions, allows substantial geographic reach and ensures that good evidence will guide future SMC implementation." **ACCESS-SMC fact sheet**, Pg 2.

38.

- **GiveWell's non-verbatim summary of conversations with Malaria Consortium staff, November 7 and November 9, 2016**.
- "The ACCESS-SMC partnership:
  - Malaria Consortium is leading the ACCESS-SMC project, tracking its impact, managing the procurement of SMC drugs and supporting malaria control programmes to implement SMC in Burkina Faso, Chad and Nigeria.
  - Catholic Relief Services is the lead-subrecipient and contributing to tracking the reach and impact of the project and supporting malaria control programmes to implement SMC in Guinea, Mali, Niger and The Gambia." **ACCESS-SMC fact sheet**, Pg 2.

39.

- See Table 7, **ACCESS-SMC multi-country cost analysis, January 2017**, Pg 19.
- See "Costs" sheet, **GiveWell SMC cost per treatment estimate, November 2017**.

40.

Summary update - GiveWell/Good Ventures funding for SMC:

- "Overall, the comprehensive SMC implementation support in what we call internally "GiveWell Districts" will target approximately 650,000 children, at an approximate cost estimated at 2.5M USD for 2017 (with some carryover costs in 2018 for operational close-out, data analysis and reporting)." Pg. 4.

- Nigeria: "Since 2013, Nigeria was supported first by Bill & Melinda Gates Foundation and then through other one-off funding to implement SMC in six Local Government Areas (LGAs) in the States of Katsina and Jigawa. Through the funding provided by GiveWell / Good Ventures, Malaria Consortium reinstated support to these 6 LGAs that did not have any confirmed funding in 2017." Pg. 2.
- Burkina Faso: "Thanks to large amount of drugs left over from various partners' activities in 2016, Burkina Faso had drugs enough to cover approximately 360,000 extra children, but no operational costs to do so. Thus, Malaria Consortium through GiveWell / Good Ventures funding has started supporting three districts that had benefited from SMC in previous years, but which had no secured support for 2017, as well as five more new priority districts for SMC." Pg. 2.
- Guinea Bissau: "The original plan was to support two regions for a total of 80,000 children, and approximately 400,000 dispersible SP+AQ blisters were directed to Guinea Bissau. However, eventually the MoH managed to secure funding for half of this target (one region) through the UNDP, and as a consequence the support in Guinea Bissau will be limited to the region of Gabu in the East of the country, targeting approximately 40,000 children under 5. The drugs that will be left over from the current order will have expiration date beyond 2019, so they will be available for use for a new round in 2018." Pg 3.

See also: **Summary framework of GiveWell / Good Ventures funding toward Malaria Consortium**

41.

- "[G]aps have been identified in a number of M&E areas, due to a phasing out of support for established activities (such as coverage surveys) and/or because of quality assurance gaps identified during the 2015 and 2016 seasons." **Summary framework of GiveWell / Good Ventures funding toward Malaria Consortium**, pg. 3
- "Malaria Consortium planned for 2017 to carry out coverage surveys following each cycle, so that the results could be better used to triangulate coverage information with cycle-specific administrative and in-process monitoring data. GiveWell / Good Ventures funding will support four coverage surveys in Chad, Nigeria and Burkina Faso. Considering an estimated cost for each survey of approximately 40,000 USD, it is estimated that such surveys (carried out by independent firms or research institutions) will total roughly 480,000 USD in 2017." **Summary update - GiveWell/Good Ventures funding for SMC**, pg. 4
- "To finalize the independent evaluation framework started under ACCESS-SMC, LSHTM will be also contracted in the role of independent technical advisory organization, supporting the revision of the evaluation protocols (whose amendments required a revised ethical approval), additional technical supervision of field surveyors, and the analysis and interpretation of results in collaboration with Malaria Consortium technical team. The role of LSHTM is expected to require roughly 300,000 USD over one year (July 2017 – June 2018, expected end date for the finalization of more nuanced analysis of coverage data)." **Summary framework of GiveWell / Good Ventures funding toward Malaria Consortium**, pg. 4
- "[In response to low coverage found in surveys in Chad and Nigeria,] seven temporary staff were recruited in Chad and, 43 (one per LGA) Nigeria, in order to improve supervision and monitoring and make sure that administrative data received is reflective [of] the real distribution process in the field. In addition, in Nigeria, independent monitors will carry out in-process monitoring during the cycles (while this role in Chad will be played by the temporary support staff mentioned above)." **Summary update - GiveWell/Good Ventures funding for SMC**, pg. 5
- "New SMC child cards (which are normally distributed for multiple years) were printed in 2017, which included a unique identifier of 7 or 8 figures. [...] The cost of reproducing these tools was not fully represented in the UNITAID budget, and not budget expansion was agreed." **Summary update - GiveWell/Good Ventures funding for SMC**, pg. 5
- "Malaria Consortium decided to contract Dharma for the establishment of a comprehensive platform for the storage, management and analyses of SMC data, including both administrative data and ad-hoc evaluation data such as those generated by coverage surveys. The estimated cost of this setup and platform management is approximately 100,000 USD for the current year (mostly related to setup, training and including 40,000 USD of license). Yearly license of 40,000 USD in subsequent years will need to be embedded in any future SMC proposal." **Summary update - GiveWell/Good Ventures funding for SMC**, pg. 5

42.

- **Malaria Consortium emails (unpublished), November 23, 2016**.
- Work not discussed above includes some work supported by a "one-off" grant "to implement SMC in six LGAs in the States of Katsina and Jigawa." **Summary framework of GiveWell / Good Ventures funding toward Malaria Consortium**, pg. 1
  - [Under "Scale up – plans and possibilities":] "In Nigeria in 2014 (9.2 million children) Malaria Consortium will target 500,000 children in Katsina and Jigawa state (CHAI will also implement in Kano state if funding can be obtained)," Slide 22, **Malaria Consortium, SMC presentation, May 6, 2014**.
  - "Malaria Consortium has already started working with the Ministry of Health to roll out SMC in Katsina through its management of SuNMaP (the DFID-funded Support for the National Malaria Programme) and with support from the Bill & Melinda Gates Foundation. SuNMaP will also support the roll out of SMC across Jigawa state and Malaria Consortium has plans to extend the activity to additional states in due course." **Malaria Consortium website, "Seasonal Malaria Chemoprevention"**.

43.

ACCESS-SMC, 2016 direct costs

44.

Summary framework of GiveWell / Good Ventures funding toward Malaria Consortium

45.

"Overall, the comprehensive SMC implementation support in what we call internally 'GiveWell Districts' will target approximately 650,000 children, at an approximate cost estimated at 2.5M USD for 2017 (with some carryover costs in 2018 for operational close-out, data analysis and reporting)." **Summary update - GiveWell/Good Ventures funding for SMC**, pg. 4

Malaria Consortium's budget for GiveWell-directed funds includes $2.39 million for "GiveWell Districts" and $0.55 million for drug procurement and delivery. **Malaria Consortium, Financial summary, September 2017**, pg. 2

46.

Malaria Consortium's budget for GiveWell-directed funds includes $0.51 million for monitoring support in ACCESS-SMC areas, $0.48 million for coverage evaluation and $0.3 million for LSHTM TA Word on coverage surveys, for a total of $1.29 million.

Discussion of activities in **Summary update - GiveWell/Good Ventures funding for SMC**.

47.

Malaria Consortium's budget for GiveWell-directed funds includes $100,000 for data management overhaul (described in **Summary update - GiveWell/Good Ventures funding for SMC**), $50,000 for global coordination cost, and $437,000 (10%) for overheads, for a total of $587,000 (**Malaria Consortium, Financial summary, September 2017**).

48.

Cost analysis of the seasonal malaria chemoprevention project in Katsina state, Nigeria. For example, see Tables 4 and 5, Pgs 20-21.

49.

Diego Moroso, Project Director for ACCESS-SMC at Malaria Consortium, email to GiveWell, August 14, 2017.

50.

Some additional details on this activity: "All drugs procurement is centralized at our Kampala office for all countries. We require countries to carry out a revised quantification every year based on consumptions and stocks from previous years, consolidate orders, recruit procurement agent, negotiate pricing points with Guilin (and in the future, more pharma companies we hope), we monitor production and shipment schedules and make sure country teams are aware of when drugs

come / delays, etc. Countries are responsible for providing us with all the relevant import requirements to make sure that all documentation is ready when drugs arrive. They then work out with local clearing agents the custom procedures, tax waivers, etc, and proceed with whatever logistics options / approaches are relevant in their countries (from direct delivery to peripheral health units as in Nigeria, to mixed approaches involving MoH storage and MC / CRS transport, to full contracting with MoH-mandated central pharmacy – depends on context)." Diego Moroso, Project Director for ACCESS-SMC at Malaria Consortium, email to GiveWell, August 14, 2017.

51.

Some additional details on this activity: "Malaria Consortium developed all original training material for ACCESS-SMC [...] We could say that now the materials are pretty settled, with only minor changes / improvement happening yearly or less, based on experience from the field. We co-organize central trainings with [National Malaria Control Programs], and we then support and oversee cascade trainings (always in joint MC/NMCP teams – CRS teams in former CRS countries under ACCESS-SMC)." Diego Moroso, Regional Project Director for ACCESS-SMC at Malaria Consortium, email to GiveWell, August 14, 2017.

52.

See **this spreadsheet**, sheet "Coverage."

53.

Malaria Consortium, comments on a draft of this page, October 2017

54.

For example, see:

- "Malaria is still a serious public health concern in Nigeria, with fevers presumed to be malaria accounting for 60 percent of outpatient visits to health facilities, 30 percent of childhood deaths, 25 percent of deaths in children under one year and 11 percent of maternal deaths. In northern Nigeria, where malaria transmission is highly seasonal, malaria prevalence is also comparatively higher than other areas during the rainy seasons. The implementation of SMC in Katsina is specifically intended to reduce mortality in children under five living in areas with seasonal malaria, and strengthen health systems at the state and national levels." **Malaria Consortium, Project Brief: Seasonal malaria chemoprevention, Katsina**, Pg 1.
- Under "Why Katsina State" in **Malaria Consortium, SMC presentation, May 6, 2014**:
  - "Katsina State is within the Sahel Region; rainy season and peak malaria incidence from July to October
  - 2012 estimated population of 6,916,641
    - 1,383,328 under-5 years
    - 600,281 cases of malaria (2008)
    - 4,103 malaria related deaths
  - Katsina overall under-5 mortality rate 180 per 1,000 live births
- Also, Malaria Consortium told us that “eligible districts are established by the National Malaria Programmes in the countries applying the WHO rainy season seasonality rules.” **Malaria Consortium emails (unpublished), November 23, 2016**.

55.

See **this spreadsheet**, sheet "Coverage."

56.

A few sources that seem to discuss the two different methods are:

- **Timothy Rubashembusya Trip Report from Burkina Faso, August 2016** includes a table that shows discrepancies in estimated coverage rates between "MC data" and "LSHTM survey". See Pg 4.

- **Timothy Rubashembusya Trip Report from Burkina Faso, August 2016** writes: "Propose data quality assessments for 2015 distribution data: The background of this was due to major discrepancies of coverage rates arising between the LSHTM 2015 End of Cycle survey and the administrative data submitted. Whereas these are not expected to be exactly the same, there were some major discrepancies in Cycle 4 coverage rates arising from the LSHTM survey in relation to the data reported through our routine reports.

  Examining further the results from the LSHTM reports presents some questions about the numbers presented which will only be ascertained by further evaluation of where the problem arose from. For example, the LSHTM reports that the rate of children who received all the 4 cycles was 86.4%. This isn't realistic as both Cycle 4 and Cycle 3 from the same survey showed rates less than 86.4% (ie. 68.4% and 82.0%, respectively). i.e. the number of those who received all the 4 cycles would need to be less or equal to the least cycle coverage rate to be valid – which is not the case.

  Recommendation: These discrepancies will be assessed further in relation to other countries to enable propose a clear strategy. However in the interim, I have proposed to plan a data verification exercise for 3 randomly selected districts out of the 11 which were part of the 2015 SMC distribution. This verification exercise would only focus on the fourth cycle – given that this is where we see a major gap. Out of these 3 districts, we would need to validate the records available at 3 (also randomly selected) CSPSes by comparing these records with those submitted in the MC reports. I will collaborate directly with Damiba Jean-Dieudonne to see how this can be achieved and in what timeframe." **Timothy Rubashembusya Trip Report from Burkina Faso, August 2016**, Pgs 4-5.

- "SMC coverage surveys: All eligible children in endemic areas are expected to receive SMC every month during the high transmission season. Although output level data will provide information on the number of children who received SMC during each distribution cycle, the real coverage at population level can only be measured through representative household surveys, similar to coverage assessment of the Expanded Programme of Immunization (EPI). Indeed, sampling households at community level will guarantee the inclusion of eligible children potentially missed by the distribution teams and the exclusion of outsiders to the targeted community." **ACCESS-SMC M&E strategy, November 2015**, Pg 8.

57.

- We came to this understanding through comments from **Malaria Consortium emails (unpublished), November 23, 2016**.
- Relevant quotes include:
  - "Routine monitoring data included SMC distribution data, extracted from SMC registers and selected routine health facility Health Management Information System (HMIS) data obtained from selected sentinel sites.

    Routine SMC distribution data was extracted from community health workers (CHWs) at the end of each distribution cycle. This data was aggregated at settlement, ward and LGA levels and compared with the estimated eligible population totals to establish SMC coverage at each distribution cycle. SMC coverage, estimated from distribution data is highlighted in figure 1 below. A total of 487,353 treatment courses were delivered in two LGAs over three treatment cycles in the first round of SMC representing an average of 115% coverage over the three cycles. In 2014, a total of 1,078,440 treatments were provided across four LGAs over four cycles with an average of 115% administrative coverage." **Malaria Consortium, Monitoring and evaluation summary Nigeria**, Pg 2.

  - "Table 1: Routine data and sources…Children reached…[Routine data source:] CHWs & HF [Health Facility] SMC drug registers" See Table 1, **Malaria Consortium, M&E Plan Nigeria**, Pg 10.
  - We have seen a few versions of templates for registers that CHWs may use when distributing SMC drugs. The latest version that we have seen is here: **ACCESS-SMC Register Template**.
  - We have seen a few versions of templates for "SMC Record Cards." The latest version that we have seen (from 2016) is here: **SMC Record Card Template 2016**.

- Regarding data management, Malaria Consortium writes: "The project will set up a data management system to track all indicators both routine and non-routine. All data collected by the project from the different data sources mentioned above will systematically be entered into a database resident at the project offices in Katsina. The system will have in built data cleaning, validation and reporting modules to allow timely extraction of performance reports based on the data submitted. Under the management of project research officer, the data management system will be routinely used for the following purposes:
  - Produce reports for feedback to providers of the data on project progress e.g. SMC coverage, trends in malaria presentation
  - Produce indicator performance statistics to aid project management and decision making regarding project implementation." **Malaria Consortium, M&E Plan Nigeria**, Pg 17.
- We have not yet seen reports from the above data management system.

58.

- "Each CDD/CHW team fills – among other things – one tally sheet per day with one directly observed treatment per child successfully treated – among other information recorded, by age, and which they submit to their reference health facility (to the head nurse or doctor, as applicable).
- The health workers consolidate tally sheets each day, and transmit information by SMC or calls or other means to district.
- District data managers (or equivalent role) consolidate all tally sheet data from their facilities and submit for validation / consolidation to regions and NMCP / central administration.
- This is how data for any mass campaign are managed, with slight variations in roles, tools, layers of control / validation, quality assurance elements." **Malaria Consortium emails (unpublished), November 23, 2016**.

59.

For example, see:

- It appears that about 62% of targeted children received at least 3 cycles of SMC in 2014 according to coverage surveys. See Table 5.3, **Malaria Consortium, Nigeria SMC evaluation report, 2014**, Pg 31. However, it appears that administrative coverage showed coverage estimates of over 100%: "A total of 487,353 treatment courses were delivered in two LGAs over three treatment cycles in the first round of SMC representing an average of 115% coverage over the three cycles. In 2014, a total of 1,078,440 treatments were provided across four LGAs over four cycles with an average of 115% administrative coverage." **Malaria Consortium, Monitoring and evaluation summary Nigeria**, Pg 2. The figure 62% refers to the proportion of targeted children receiving at least 3 cycles of treatment according to coverage, while 115% refers to the average administrative rate of coverage in each cycle of treatment. While these numbers are not directly analogous, we believe they demonstrate the discrepancy between these two types of coverage estimates.
- ACCESS-SMC: "Percent coverage (3-59 months) [who received four cycles]" versus "Percent of children (3-59 months) receiving four full cycles of SMC, based on LSHTM coverage survey" in Table 3, **ACCESS-SMC multi-country cost analysis, January 2017**, Pg 12.
- **Timothy Rubashembusya Trip Report from Burkina Faso, August 2016** includes a table that shows discrepancies in estimated coverage rates between "MC data" and "LSHTM survey". See Pg 4.

60.

GiveWell's non-verbatim summary of a conversation with Malaria Consortium Staff, November 23, 2016.

61.

Malaria Consortium, comments on a draft of this page, October 2017

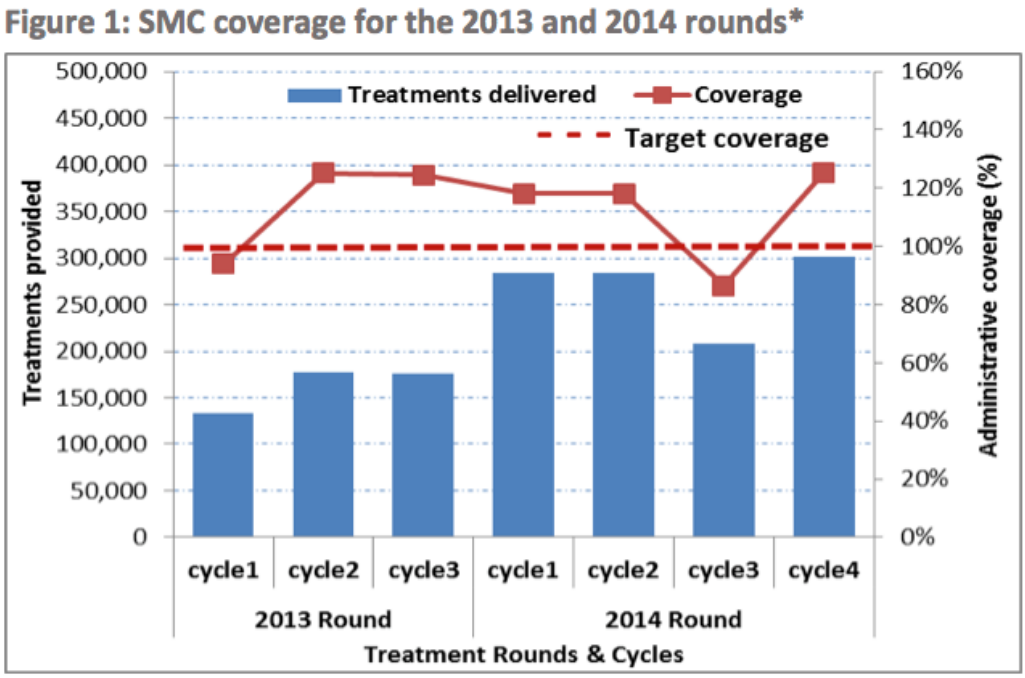
62.

For estimates of how many children who were six to seven years old received at least one cycle of SMC in ACCESS-SMC countries in 2015 and 2016, see **this spreadsheet**, sheet "Coverage." The estimates suggest that, among children in this age group whose caregivers were interviewed, 56% (range across countries: 15%-81%) received at least one cycle of treatments.

63. **GiveWell's non-verbatim summary of a conversation with Malaria Consortium Staff, November 23, 2016**. Early data from 2017 surveys in **this spreadsheet**, sheet "Coverage."

64. Administrative coverage estimates often seem to find coverage rates ranging from about 70% to about 130%:

- Summary information from Malaria Consortium-supported programs in northern Nigeria in 2013 and 2014:
  - "A total of 487,353 treatment courses were delivered in two LGAs over three treatment cycles in the first round of SMC representing an average of 115% coverage over the three cycles. In 2014, a total of 1,078,440 treatments were provided across four LGAs over four cycles with an average of 115% administrative coverage." **Malaria Consortium, Monitoring and evaluation summary Nigeria**, Pg 2.
  - Chart of coverage:



The 2013 round had three treatment cycles whereas 2014 round had four treatment cycles

- Summary information from ACCESS-SMC programs:
  - See Table 3, **ACCESS-SMC multi-country cost analysis, January 2017**, Pg 12.
    - Regarding methodology, it notes: "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.
" **ACCESS-SMC multi-country cost analysis, January 2017**, Pg 11.

- There appears to be some administrative data in **ACCESS-SMC, summary administrative coverage spreadsheet**, but we are not sure of the methodology underlying it or what year it is from.

65.
See Cell L14, **GiveWell summary of SMC coverage information, November 2016**.

66.
- ACCESS-SMC monitoring and evaluation plan: **Malaria Consortium, Annex III: evaluation of seasonal malaria chemoprevention**, Pgs 13-14.
- **GiveWell's non-verbatim summary of a conversation with Paul Milligan and Diego Moroso, August 2, 2017**

67.
Table 2, **ACCESS-SMC M&E strategy, November 2015**, Pg 10: "Responsible partner" for the "Project indicator" "Population coverage" is "LSHTM."

68.
Results and sources in **this spreadsheet**, sheet "Coverage."

69.
"One month after the last SMC cycle in 2015, and after the last cycle in 2016, a household survey will be undertaken to record the dates of SMC doses received that year. The survey will be done shortly after the last CMS cycle in order to minimise the time interval for recall." **Malaria Consortium, Annex III: evaluation of seasonal malaria chemoprevention**, Pg 13.

70.
Results and sources in **this spreadsheet**, sheet "Coverage."

71.
- "A two-stage cluster sample survey will be used to provide estimates of the proportion of eligible children who received 0,1,2,3 or 4 SMC treatments, representative of the areas where SMC is implemented." **Malaria Consortium, Annex III: evaluation of seasonal malaria chemoprevention**, Pg 13.
- "Sampling for the coverage survey: From a list of all communities (villages or census enumeration areas) in the areas that received SMC, about 60 communities will be selected with PPES [Probability proportional to estimated size]. In each selected community, a sample of an approximately constant number of households will be made from village lists or using area sampling. All eligible children resident in the household at the time of the survey should be included. If any children are away or the parent is not present to interview, a call-back visit should be arranged before documenting a non-response for that child or household." **Malaria Consortium, Annex III: evaluation of seasonal malaria chemoprevention**, Pg 14.

- "The SMC coverage surveys use area sampling to select participants within villages. In area sampling, researchers make a map of the village and divide it into segments, then the tablet automatically chooses a segment at random, and the interviewers include every household in that segment. This method, known as compact segment sampling, involves no subjectivity on the part of the researchers, an issue which can be an important source of bias in coverage surveys. GPS tracking of the tablets provides the location of each household, allowing supervisors to check exactly where the survey teams went. In most countries, villages were selected using probability proportional to size sampling with approximately 50 clusters representing the entire area where ACCESS-SMC was operating. The exception is Niger, in which the researchers performed separate surveys in four representative regions, because the country is too large for them to conduct surveys everywhere." **GiveWell's non-verbatim summary of a conversation with Paul Milligan and Diego Moroso, August 2, 2017**, pgs. 3-4

72.

- "Sample size: About 10 children per community are required for a sample size of 600 this will give good precision on the overall estimates of coverage while permitting reasonable precision on sub-regional estimates. To allow for the fact that children up to 7 yrs of age will be surveyed, the sample size is increased to 14 per cluster (total 60x14=840). In vaccination coverage surveys in the Gambia, the rate of homogeneity (roh) for DPT3 was about 0.2, this gives a design effect of Deff=1+(b- 1).roh=2.8 for a cluster size b=10. A survey of 600 then corresponds to a sample size of 600/2.8=214 if we were to use simple random sampling and this would give, if the coverage was 70%, a margin of error (95% confidence interval) of +/-6%, if the coverage was 50%, +/-7%. And for sub-regional estimates, if we divide the area into three with 200 sampled in each of these three areas, the precision would be 50% +/-12% or 70% +/-11%. For estimating coverage in the out-of-range children (>5yr and 7<yrs), if we have about 4 of these per cluster, a total of 60x4=240, we would have a margin of error of +/-8% if the coverage was 20%." **Malaria Consortium, Annex III: evaluation of seasonal malaria chemoprevention**, Pg 14.
- For the three coverage surveys we have seen from 2017, the sample size exceeded 600 in each. Sources in **this spreadsheet**, sheet "Coverage."

73.

- "A two-stage cluster sample survey will be used to provide estimates of the proportion of eligible children who received 0,1,2,3 or 4 SMC treatments, representative of the areas where SMC is implemented." **Malaria Consortium, Annex III: evaluation of seasonal malaria chemoprevention**, Pg 13.
- Regarding the definition of "eligible children": "Study populations: SMC is aimed at children aged 3 to 59 months old. Children who receive SMC at the first cycle of the year, but have their 5th birthday before the last SMC cycle, should continue to receive SMC that year, but will not be eligible next year. Therefore, in the survey, eligible children are defined as those who are aged at least 4 months at the time of the survey (hence would have been at least 3 months old when the 4th SMC cycle took place), and are aged less than 5 yrs and 4 months. However, it is possible that older children are receiving SMC and it will be useful to capture this. Therefore, in the survey, all children aged less than 7 years at the time of the survey will be included, and the date of birth and age carefully noted to allow estimates of coverage in the target age range to be made. The sample size will be increased to ensure the target number in the eligible age range is obtained.

  Care should be taken to obtain the correct date of birth, this should be noted from the child's health card, where this is not available, the child's age should be recorded as accurately as possible using an event calendar, and referring to children in the compound of similar age whose date of birth is known." **Malaria Consortium, Annex III: evaluation of seasonal malaria chemoprevention**, Pgs 13-14.

74.

Sources in **this spreadsheet**, sheet "Coverage."

75.

- Regarding how SMC Record Cards are used: Our understanding is that CHWs are expected to record the first dose of each cycle and the date they gave the dose on a family's Record Card and that the family is expected to record all other doses. We

have seen a few versions of templates for "SMC Record Cards." The latest version that we have seen (from 2016) is here: **SMC Record Card Template 2016**.

- "Children in endemic areas should receive SMC every month for up to 4 months in the transmission season. A key indicator that should be reported is the percentage of children that receive all of their scheduled SMC treatments. Provided SMC doses are accurately recorded on a family-held record card, this can be done through household surveys using a similar methodology to that employed for vaccination coverage surveys, but will need to be supplemented by asking mothers about treatments." **Malaria Consortium, Annex III: evaluation of seasonal malaria chemoprevention**, Pg 7.
- "Q62: Was (Name) given a card to keep record of the drugs given?...If No or DK => Q64." "Q64: Did the child take the first dose in the presence of the caregivers for each distribution cycle? Q65: Did you continue to give the tablets at home the following days?" **ACCESS-SMC, Questionnaire for SMC coverage survey**, Pgs 14-15.
- "SMC doses: Dates of SMC doses will be recorded from the child's SMC card. In countries where administration of SMC doses was recorded electronically, a hand-held device will be used to read the QR code on the child's card. The mother or carer should also be asked about receipt of SMC doses to cross-check the information on the card and to provide information about doses where the card has been lost. A short questionnaire, including reasons for missed SMC cycles, and adherence to the supervised and home doses, occurrence of fever in the child in the last 2 weeks and any treatment seeking for that fever, and the use of bednets by the child, will be completed. Where possible, a cross-check on SMC dates should be made from the SMC register." **Malaria Consortium, Annex III: evaluation of seasonal malaria chemoprevention**, Pg 14.
- "The researchers ask caregivers: Do you know about the SMC program? Has your child had SMC? How many times did the health worker come? How many times did you get a blister pack for this child? Did you get a blister pack in the first month, the second month, the third month, and the most recent month? Then they take the SMC record card and transcribe what is written on it. This year, researchers will photograph the card as well, to remove transcription error." **GiveWell's non-verbatim summary of a conversation with Paul Milligan and Diego Moroso, August 2, 2017**, pg. 3

76.

Examples of questions are pulled from **ACCESS-SMC, Questionnaire for SMC coverage survey** and from **Malaria Consortium emails (unpublished), November 23, 2016**.

77.

"SMC record cards greatly improve accuracy. However, caregivers do not always retain the cards; in these cases caregiver recall is the only source of information. In addition, SMC record cards are not always fully completed by health workers, meaning that the cards are not necessarily reliable. To mitigate the problem of unreliability, ACCESS-SMC researchers ask the caregiver to remember the number of treatments their child had without looking at the record card, then check the caregiver's answers against the card. Agreement has been generally good but where there is a discrepancy the interviewer tries to resolve this; if this cannot be done, the number of treatments indicated on the card is used unless the caregiver states a larger number, in which case the caregiver's report is used, as it is known that cards can be under-completed." **GiveWell's non-verbatim summary of a conversation with Paul Milligan and Diego Moroso, August 2, 2017**, pg. 5

78.

"All coverage survey data are collected directly into tablet computers. The tablets used in the surveys should automatically record the GPS location where the data are being captured. This feature was not working reliably last year, but is expected to work this year." **GiveWell's non-verbatim summary of a conversation with Paul Milligan and Diego Moroso, August 2, 2017**, pg. 3

79.

GiveWell's non-verbatim summary of a conversation with Paul Milligan and Diego Moroso, August 2, 2017, pg. 4

80. **Malaria Consortium emails (unpublished), November 23, 2016**
Malaria Consortium, conversation with GiveWell, November 1, 2017

81. Our understanding is that CHWs are expected to record the first dose of each cycle and the date they gave the dose on a family's Record Card and that the family is expected to the other two doses.

82. The program included over 47,000 CHWs distributing SMC to over 6 million children. Malaria Consortium, comments on a draft of this page, October 2017

83. The two data points we've seen were from the first two cycles in Burkina Faso in 2017. 24% and 56% of caregivers who reported that their child had been treated in the most recent SMC cycle had retained a blister pack. Sources in **this spreadsheet**, sheet "Coverage."

84. This quote is pulled from an unpublishable source: **ACCESS-SMC, Health impact data** with edits from **Malaria Consortium emails (unpublished), November 23, 2016**. The original source wrote that if the probability of receiving SMC at each cycle is 88%, the expected percentage who would receive at least three treatments is 93%. However, assuming that the probability of receiving each cycle is independent of whether the child received other cycles we believe that the correct figure here would be 67%. See Cells AF4 and AF9 in **GiveWell summary of SMC coverage information, November 2016**.

85. "The proportion of children excluded due to illness is less than 5%." **GiveWell's non-verbatim summary of a conversation with Paul Milligan and Diego Moroso, August 2, 2017**, pg. 5

86. **Malaria Consortium emails (unpublished), November 23, 2016**.

87.
- "The survey was conducted in the 2nd phase LGAs which had received one round of SMC in from July to October 2014. Information on SMC receipt at each cycle was predominantly obtained from SMC cards given to the caregivers and from verbal responses of sampled caregivers in cases where the card could not be obtained." **Malaria Consortium, Nigeria SMC evaluation report, 2014**, Pg 30.

88.
- "At each survey round, the survey was designed using a two-stage cluster sampling for a sample size of 750 households from 30 clusters (30 clusters X 25 households) selected with probability proportionate to size." **Malaria Consortium, Nigeria SMC evaluation report, 2014**, Pg 7.
- "Sampling and sample size: The survey employed a two stage cluster sample design. However, only sampling at the second stage was done. There was no re-sampling of clusters (first stage) as similar clusters sampled at baseline were used." **Malaria Consortium, Nigeria SMC evaluation report, 2014**, Pg 4.
- "Stage one: Stage one involved sampling of the primary sampling units (clusters) which were the enumeration areas (EA), usually settlements. At each of the survey rounds, a total of 30 clusters were selected with probability proportionate to size from which both the household and child health components of the surveys evaluation were conducted." **Malaria Consortium, Nigeria SMC evaluation report, 2014**, Pg 4.
- "Stage two: The second stage involved initially listing all households per cluster (settlement) for all the 30 clusters. From this, 25 households were selected per cluster using systematic sampling.
A household was defined as a group of people who usually take their meals together. For enumeration areas of more than

150 households, an equal size section approach was used, i.e. the cluster was divided into two to four sections of approximately equal number of households, and one section was selected using simple random sampling. All households in that section were then mapped and the sample drawn as described above.
The sample size of children under five that would give 95 percent power to detect a difference between 10 and 15 percent in malaria prevalence would be 690 in each survey. Respondents for the household survey were the heads of the household, from whom information relating to the household were obtained. Caregiver of children age under five years were the main respondents for information around knowledge of malaria prevention and health seeking behaviour for febrile children and SMC. Both household and caregiver questionnaires were based on the respective Malaria Indicator Survey (MIS) modules to ensure a standard approach[6].
All caregivers who were either permanent residents of the households sampled or visitors in the households on the night before the survey were eligible to be interviewed in the survey. All children 3-59 months who were listed in the household were eligible for the malariometric and anthropometric component of the survey." **Malaria Consortium, Nigeria SMC evaluation report, 2014**, Pg 4.

- "Table 2.1 below shows the response rates for both surveys. Both surveys had very good response rates with baseline response rate of 94 percent and 98 percent at endline. Interviews were conducted at the first visit to the household in more than 90 percent of the households at all survey rounds. Analysis was not weighted due to the invariability of information on cluster sizes." **Malaria Consortium, Nigeria SMC evaluation report, 2014**, Pg 7.
- "The survey was conducted in the 2nd phase LGAs which had received one round of SMC in from July to October 2014. Information on SMC receipt at each cycle was predominantly obtained from SMC cards given to the caregivers and from verbal responses of sampled caregivers in cases where the card could not be obtained." **Malaria Consortium, Nigeria SMC evaluation report, 2014**, Pg 30.
- "Table 3.1 below shows the geographic distribution of the households visited. A similar sample size was planned at both baseline and endline in the two LGAs. Results show that this was achieved with an equal sharing between Dutsi and Maiadua at the two survey rounds. Using Principle component analysis, households were classified into five relatively equal wealth categories based on their household possessions. Effort was made to use the same household characteristics at both survey rounds to enable comparability between the survey rounds." **Malaria Consortium, Nigeria SMC evaluation report, 2014**, Pg 8.

89.

- See Table 1, **Malaria Consortium, Nigeria SMC evaluation report, 2014**, Pg 7.
- "Overall reported coverage of SMC (receipt of at least one dose of SMC) was very high at 83.9 percent after one round of distribution. The coverage was deemed equitable by social economic status and gender as coverage was similar across each category. Dutsi LGA had a significantly higher coverage (94.8 percent) compared to Mai'adua.
Coverage per cycle slightly declined at subsequent cycles from 75 percent in cycle one through to 55 percent at cycle four. This is in cases where information could be obtained. SMC distribution at each cycle was equitable. 61.8 percent of all children for whom data was collected received at least 3 cycles of SMC." **Malaria Consortium, Nigeria SMC evaluation report, 2014**, Pg 30.

90.

- See Table 5.2.4, **Malaria Consortium, Nigeria SMC evaluation report, 2014**, Pg 28.
- It seems that a slightly different survey tool may have been used than is used in the ACCESS-SMC coverage surveys.

91.

Unpublished source. Malaria Consortium notes, "Preliminary results from 2015 also showed reduced malaria cases in children under 5 preliminary results: 65% Guinea; 49% Mali, 46% BF and 24% Chad." Malaria Consortium, comments on a draft of this page, October 2017. We have not seen more information on these results.

92.

"The impact of the SMC programme in reducing the number of cases of confirmed malaria treated at health facilities has been assessed using reports of cases in the national health management information systems (HMIS), and by collecting more detailed data on all of the individual cases treated from selected health facilities that have served as sentinel sites for

measuring the malaria burden more accurately than is possible from the national data."
ACCESS-SMC, Research progress update, April 2017, Pg 2.

93.

"Efficacy of SMC treatments will be measured using the case control approach. Malaria cases, and controls who do not have malaria, will be recruited concurrently, and the dates of the doses of SMC they received noted. The efficacy of SMC can then be calculated as a function of the time since treatment using case-control analysis. It is essential that dates of SMC doses are accurately documented, and that malaria cases are parasitologically confirmed. Controls will be selected from the community, in the neighbourhood where the case lived at the time they had malaria. Trained fieldworkers will collect information about cases and controls, and make home visits to record bednet use and other household factors that may act as confounders. Microscopy will be used to confirm cases and to measure parasite density. Controls will be confirmed to be negative for P.falciparum, by RDT." **Malaria Consortium, Annex III: evaluation of seasonal malaria chemoprevention**, Pg 10.

94.

ACCESS-SMC, Research progress update, April 2017, pg. 4

95.

"Resistance to sulfadoxine-pyrimethamine (SP) and amodiaquine (AQ) is associated with specific gene mutations in the malaria parasite. Monitoring the prevalence of these markers, in malaria cases health facilities and in *P. falciparum* carriers in the general population, permits early warning of emerging problems with drug resistance. This progress update is on monitoring *P. falciparum* resistance markers. The objective of the molecular monitoring through the ACCESS-SMC project was to establish a baseline for monitoring the prevalence of the markers across the subregion using standardised methods, and to determine if there have been any important changes in the prevalence of these markers after two years of SMC at scale. [...] The baseline surveys were done at the end of the 2015 transmission season in all seven countries. (In 6 countries, sampling was done in areas which had not started SMC but would implement the following year. In The Gambia, sampling was in an area where SMC had been implemented for two years). In each country, one locality was chosen, blood samples were collected from approximately 2000 children under 5 years of age and 2000 individuals 10-30 years of age per country, taken onto filter paper and shipped to London to the LSHTM laboratories for analysis. The older age group was included because they would not be treated with SMC drugs, assessment of trends in the prevalence of markers of resistance in this group therefore allows us to determine whether SMC is leading to changes in the circulating parasite population." **ACCESS-SMC, Progress update - Resistance monitoring**, pg. 3

96.

ACCESS-SMC, Progress update - Resistance monitoring, pg. 3

97.

- "The objective of the molecular monitoring through the ACCESS-SMC project was to establish a baseline for monitoring the prevalence of the markers across the subregion using standardised methods, and to determine if there have been any important changes in the prevalence of these markers after two years of SMC at scale [...] The baseline surveys, before scale-up of SMC, showed very low frequencies of mutations associated with SP and AQ resistant genotypes. The markers indicative of resistance to SMC drugs are shown in the following table." **ACCESS-SMC, Progress update - Resistance monitoring**, pg 3.
- "This report presents an update on analysis of baseline survey data. A second survey is planned to be conducted in each country at the end of the 2017 transmission season. The baseline surveys were done at the end of the 2015 transmission season." **ACCESS-SMC, Progress update - Resistance monitoring**, pg 7.
- "It is critical to repeat the sampling after two years of SMC at scale, and at intervals thereafter, to determine whether parasite genotypes resistance to SMC drugs has become more common. [...] Demonstration that the key mutations remain at low frequencies will be crucial for sustaining donor support for SMC." **ACCESS-SMC, Research progress update, April 2017**, pg. 5

98.

- "Sentinel data are required in addition to HMIS data because in most countries incomplete reporting makes the HMIS data difficult to interpret, and in all countries HMIS data are aggregated into three groups (under 5 years of age, 5 years and over, and pregnant women), and therefore cannot be used to determine whether there has been any increase in malaria incidence in the 5, 6 and 7 year-olds who recently stopped receiving SMC – an important concern with regard to safety." **ACCESS-SMC, Research progress update, April 2017**, pg. 2
- Malaria Consortium, comments on a draft of this page, October 2017. Malaria Consortium also notes, "The effects, if they occur, will be in children who had SMC for at least 3-4 years, and then stop / move out of the eligible age group. In practice, we've seen quite a lot of treatment in 6 and 7 yr olds, so will need to look to see any evidence for an increase in incidence in 8-9 year olds after the SMC has been running for a few years. Considering these aspects, it won't be until 2018-2019 most likely that we would start seeing those effects if SMC continues. Now, if SMC stops abruptly, we may see some effects in older children (5yo) in areas that started before ACCESS-SMC (2013). There may be some of such areas in Burkina, Chad and Nigeria."

99.

"The most common reaction seen with SMC drugs during the pilot studies and during the first year of ACCESS-SMC was regurgitating the drug after ingestion. This was due to the unpleasant and lasting bitter taste of amodiaquine and because the hard tablets were not always crushed into a fine powder before mixing with water, which often caused children to gag and expel the medicine. Since the introduction of the orange flavored dispersible amodiaquine and SP tablets, this is no longer a common problem." Malaria Consortium, comments on a draft of this page, October 2017

100.

- We have seen one estimate from Malaria Consortium that suggested that roughly 0.5%-1.5% of children who received SMC drugs vomited. See **Malaria Consortium, 2013 operational data**. We have not vetted this estimate. We have not seen other information about vomiting in Malaria Consortium's monitoring.
- Malaria Consortium, comments on a draft of this page, October 2017

101.

"It is very rare that children become sick after taking SMC medicines, but some children may feel a bit sick for a short while; what are some symptoms children may have? a) diarrhoea, b) itching, c) headache, d) mild abdominal pain, e) rash, f) a,b, and c, g) d,e, and f, h) All of the above, [Correct answer: H.]" **Malaria Consortium Quiz Answer Key**.

102.

"In Nigeria, there was a follow-up of a cohort of 10,000 children one week after each SMC cycle to ask about side effects, and to assess the frequency of mild and moderate side effects that may not be reported to the health facility. [...] The 10,000 children cohort in Nigeria produced only five PV reports, and it seems to be linked to some reluctance to report by beneficiaries." **ACCESS-SMC, Progress update - Safety monitoring**, pgs. 7 and 10.

103.

- **ACCESS-SMC, Reported severe adverse events**.
- **NDiaye et al. 2016**.
- **ACCESS-SMC, Progress update - Safety monitoring**

104.

"We are only permitted to procure products from suppliers that meet WHO stringent guidelines for pre-qualification of malaria drugs to ensure high-quality and efficacy of SP and AQ." Malaria Consortium, comments on a draft of this page, October 2017

105.

See our most recent **model**, "SMC" and "Results" sheets.

106.

- Source for "The grant was originally set to cover SMC treatments in 2015 and 2016 and was extended to cover some treatments in 2017" is Diego Moroso, conversation with GiveWell, July 26, 2017.
- "The original ACCESS-SMC grant was expected to end on August 31st, but Malaria Consortium secured a cost extension up to February 28, 2018, to complete the third season in the abovementioned countries, and carry out an endline molecular markers' survey in the seven ACCESS-SMC countries, to track trends in parasite resistance to SMC drugs." **Summary update - GiveWell/Good Ventures funding for SMC**, pg. 1
- Malaria Consortium, comments on a draft of this page, October 2017

107.

GiveWell's non-verbatim summary of conversations with Malaria Consortium staff, November 7 and November 9, 2016.

108.

- In April 2014-March 2015, it appears that about 11% of Malaria Consortium's total expenditure was unrestricted. See "Resources expended" from 2015 and compare "Restricted funds" and "Total funds" columns on **Malaria Consortium, Trustees' report and financial statements 2015**, Pg 17. Percentage of spending coming from restricted funds calculation: 50,626,000 British pounds / 56,809,000 British pounds = 0.89.
- In April 2015-March 2016, it appears that about 14% of Malaria Consortium's total expenditure was unrestricted. See **Malaria Consortium, Trustees' report and financial statements 2016**, Pg 16. (Math: On the line "Total Expenditure", 5886/41189 = 0.143.)
- In April 2016-March 2017, it appears that 12% of Malaria Consortium's total expenditure was unrestricted. See . (Math: On the line "Total Expenditure", 5,900/50,840 = 0.116.)
- Malaria Consortium told us that it often uses unrestricted funding to support overhead that is needed for some of the restricted grants it receives (sometimes funders' requirements do not allow it to spend on overhead), so these unrestricted funds are not available to support new programs and activities. **GiveWell's non-verbatim summary of conversations with Malaria Consortium staff, November 7 and November 9, 2016**.
- For a more detailed breakdown of how Malaria Consortium has spent unrestricted funds in the past, see **Malaria Consortium, restricted and unrestricted expenditure analysis 2016**. It seems possible that some of the funds spent on "Monitoring & surveillance of malaria" and "Malaria strategy support" supported aspects of SMC programs, but we are uncertain.
- Malaria Consortium told us that it agrees with the U.K. Department for International Development about how it will use Programme Partnership Agreement (PPA) funds. It told us that it decides which programs to apply for PPA funds with depending on what it believes will be most impactful, and then if it receives PPA funds it is committed to spending the funds on those programs. **GiveWell's non-verbatim summary of conversations with Malaria Consortium staff, November 7 and November 9, 2016**.
- Malaria Consortium told us that it does not expect to receive PPA funds beyond 2018. **GiveWell's non-verbatim summary of conversations with Malaria Consortium staff, November 7 and November 9, 2016**.

109.

Diego Moroso, Project Director for ACCESS-SMC at Malaria Consortium, conversation with GiveWell, August 22, 2017.

110.

Malaria Consortium, comments on a draft of this page, October 2017

111.

- Diego Moroso, Project Director for ACCESS-SMC at Malaria Consortium, email to GiveWell, August 14, 2017.
- We note that in October 2017, Malaria Consortium shared a summary of donor commitments for SMC in 2016-2020 that indicated that, for 2018, there were not yet sufficient donor commitments to fully fund eligible districts in Mali and Niger. This could indicate a funding gap or possibly that donor commitments have not been made but are likely in the future.

- Malaria Consortium, comments on a draft of this page, October 2017

112. Malaria Consortium, conversation with GiveWell, November 1, 2017

113. **GiveWell's non-verbatim summary of conversations with Malaria Consortium staff, November 7 and November 9, 2016**.

114. **GiveWell's non-verbatim summary of conversations with Malaria Consortium staff, November 7 and November 9, 2016**.

115. Malaria Consortium, conversation with GiveWell, October 5, 2017.

116. Malaria Consortium, comments on a draft of this page, October 2017

117. "[T]he 5 million US Dollars awarded in February 2017 and subsequent ongoing funding [will be used for]... Operational support to SMC implementation, through expansion of Malaria Consortium involvement in areas previously covered by other donors but left unserved in 2017, or new areas not yet covered by any donors." Pg. 1 **Summary framework of GiveWell / Good Ventures funding toward Malaria Consortium**

118. Malaria Consortium, comments on a draft of this page, October 2017

119.
- In April 2014-March 2015, it appears that about 11% of Malaria Consortium's total expenditure was unrestricted. See "Resources expended" from 2015 and compare "Restricted funds" and "Total funds" columns on **Malaria Consortium, Trustees' report and financial statements 2015**, Pg 17. Percentage of spending coming from restricted funds calculation: 50,626,000 British pounds / 56,809,000 British pounds = 0.89.
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- Malaria Consortium told us that it does not expect to receive PPA funds beyond 2018 due to the discontinuation of this funding stream for all recipients by the UK government. **GiveWell's non-verbatim summary of conversations with Malaria Consortium staff, November 7 and November 9, 2016**.

120. Malaria Consortium, comments on a draft of this page, October 2017

121. See **this spreadsheet**, sheet "SMC donor mapping."

122. "Some 23.7m children are eligible for SMC, the vast majority of who live in the Sahel region." **ACCESS-SMC website, "The Project"**. Malaria Consortium told us that this estimate came from the WHO. **Malaria Consortium emails (unpublished), November 23, 2016**.

123. Slides 11-12, **ACCESS-SMC, presentation on cost and impact, June 2016**.

124. Diego Moroso, Project Director for ACCESS-SMC at Malaria Consortium, email to GiveWell, August 14, 2017.

125. **GiveWell's non-verbatim summary of conversations with Malaria Consortium staff, November 7 and November 9, 2016**.

126. **GiveWell's non-verbatim summary of conversations with Malaria Consortium staff, November 7 and November 9, 2016**.

127. See **this spreadsheet**, sheet "SMC donor mapping."

128. Malaria Consortium, comments on a draft of this page, October 2017

129. "Why is SMC not more widely available?
While 23.7 million children are eligible for SMC, currently only 3.4% of them benefit from this intervention. Health ministries, donors and communities are have shown great interest in implementing SMC and scaling it up, but five critical barriers persist:

- Countries do not yet have the systems in place to distribute SMC drugs and administer them to children, including trained staff, logistics, tools, plans and communications materials.
- Global production of quality SMC drugs falls far short of demand, and current formulations of SMC drugs are complicated for community health workers to administer.
- The delivery of SMC drugs, which are themselves relatively inexpensive, is considered to be costly, while a lack of analysis and cost benchmarking means SMC's cost effectiveness is poorly evidenced.
- Although evidence of safety and efficacy of SMC drugs has been demonstrated in trials, there is limited evidence at scale. This uncertainty prevents drug manufacturers and implementers from making large-scale investment in SMC.
- Health ministries, donors and the private sector currently dedicate insufficient financial resources to expanding SMC, meaning resources for scale-up are not available." **ACCESS-SMC website, "The Project"**.

130. ALMA LLIN gap analysis (November 2017) — unpublished source