

Evaluation of SMC coverage, efficacy, safety, drug resistance, and impact:

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Safety

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Executive summary

Background: Despite progress in malaria control in many parts of the world, sub-Saharan Africa continues to have an enormous malaria burden and malaria is the leading cause of deaths in childhood. Seasonal Malaria Chemoprevention was welcomed as a new tool because it offers the possibility of a very high degree of protection at moderate cost, in the absence of other practical options. Countries were quick to adopt SMC and, through the ACCESS project, high- quality, effective implementation has been scaled-up rapidly. But SMC is more complicated to deliver than many other interventions, and it is potentially vulnerable to the development of drug resistance. SMC programmes therefore have to be carefully monitored to ensure they are implemented effectively, and to provide evidence to donors of continued effectiveness. The purpose of the evaluation of the ACCESS-SMC coordinated by LSHTM in partnership with research groups in each country, was to monitor the process of delivery of SMC, the safety and efficacy of SMC treatments, and the impact of the ACCESS-SMC programme on the malaria burden, using standardised methods in the 7 ACCESS-SMC countries.

Each SMC treatment provides a high degree of protection for about 4 weeks. In the sub-Saharan belt stretching from southern Senegal and northern Guinea in the west to Chad and northern Cameroon in the east, the main risk period lasts for about 4 months. Four SMC treatments, if well timed, are sufficient to provide a high degree of protection. It is important that children receive treatment each month, and adhere to the treatment regimen, both to give them the most complete protection, and to keep to a minimum the number of children with lapsed protection in whom SMC drugs are present at low levels which would favour the development of drug resistance. SMC programmes therefore aim to achieve high coverage at each monthly "cycle".

In clinical trials, SMC gave a high degree of personal protection against uncomplicated and severe malaria, each monthly treatment having an average efficacy of 86% over one month. It was not known if a similar level of efficacy would be possible when SMC was delivered through national programmes, it was not known if sufficiently high levels of coverage could be achieved for SMC programmes to have a substantial public health impact, nor whether

SMC would prevent deaths from malaria. It was also unknown whether the drugs would be safe when use on a large scale, and how quickly resistance to SMC drugs would develop. It was important to answer these questions to provide evidence needed to determine whether longer term investment in SMC by donors and national governments could be justified.

Key findings:

Coverage: 14 cluster-sample surveys, including over 1,000 children in each country after each malaria transmission season, were used to measure SMC coverage. Focus groups and in-depth interviews with caregivers and health workers were used to assess the quality of delivery and check that treatment guidelines were being followed. High coverage was achieved in 2015 and maintained in 2016 when the implementation area doubled. Three monthly treatments were received per child, on average, each year, across the populations covered by ACCESS-SMC each year. Delivery was highly equitable with similar coverage across wealth rankings.

Efficacy: Children who develop malaria are less likely to have received SMC than children who remain free of malaria. By comparing the proportion of confirmed malaria cases who had received SMC in the previous 4 weeks, with the proportion of children in the general population (the controls) who had received SMC in the previous 4 weeks, the protective efficacy can be calculated. Case-control studies in five countries in 2015 and 2016 were used to measure the protective efficacy of each SMC monthly treatment. 820 cases and 1,637 controls were recruited in 2015, and 1,433 cases and 2,867 controls in 2016. SMC was associated with an 89% reduction in malaria incidence for 4 weeks after treatment, and 62% from 5 to 6 weeks after treatment, compared with children who had not received SMC or whose last dose was more than 6 weeks before.

Safety: SMC countries were supported to strengthen pharmacovigilance systems, with an emphasis on the known severe side effects of SMC drugs. A series of training workshops were held for national pharmacovigilance coordinators and malaria control program staff, and cascade training of health workers for SMC delivery included recognition and reporting of adverse reactions. Monitoring through targeted spontaneous reporting was supplemented by Cohort Event Monitoring. ACCESS-SMC strengthened national pharmacovigilance capacity. SMC countries report to the Uppsala Monitoring Centre. Severe adverse reactions are very uncommon, and a safety review in April 2017 found no safety concerns.

Drug resistance: The prevalence of molecular markers of resistance of *P.falciparum* to SMC drugs was measured using community surveys of about 4,000 individuals in each country at the end of the 2015 transmission season, before full SMC scale-up. Resistant genotypes were uncommon. Amodiaquine (AQ) resistant mutations were found in four samples (0.14% of samples from *P.falciparum* carriers) and sulfaodxine-pyrimethamine (SP) resistant

mutations in eight samples (0.33%). No samples contained both SP and AQ resistant genotypes.

Impact: The relative reduction in the number of malaria cases and malaria deaths under five years of age, compared to older age groups, observed when SMC was introduced, was estimated from the number of confirmed cases of deaths in-hospital that were reported in the national Health Management Information Systems, supplemented by data on malaria cases collected from clinic registers in selected health facilities in each country. To obtain approximate estimates of the total number of cases and deaths that may have been averted by ACCESS-SMC, estimates were derived from burden estimates from the Imperial College Malaria Model. In countries with consistent reporting, introduction of SMC was associated with a reduction of about 50% in the number of malaria deaths in implementation areas. Similar reductions in the number of confirmed cases in outpatient clinics, and the number of inpatients with a diagnosis of malaria, were observed in facilities with consistent reporting. We estimate that in 2015 and 2016, the ACCESS-SMC project averted 6 million cases of malaria, and 40,000 deaths.

Conclusions: The project has shown that high coverage can be achieved when SMC is implemented at scale; treatments provided a high degree of personal protection similar to the efficacy observed in randomized trials; SMC was well tolerated, and the incidence of severe adverse has remained very low despite improved pharmacovigilance in SMC countries; introduction of SMC was associated with a substantial reduction in the number of malaria cases and malaria deaths in children under 5 years of age. SMC has been shown to be a safe and highly effective strategy for malaria prevention in children when implemented at scale, making a substantial contribution to reducing the burden of morbidity and mortality caused by malaria in the Sahel and sub Sahel regions of west and central Africa.

Conceptual framework for the impact evaluation for SMC:

Monitoring and evaluation of SMC programmes

Factors that influence impact:

- | | | |
|-------------------------------|----------------------|-------------------|
| • Planning | • Geographical reach | • Administration |
| • Training | • Acceptability | • Adherence |
| • Supervision | • Safety | • Drug resistance |
| • Supply chain | • Eligibility | |
| • Child-friendly formulations | • Population size | |



Measurement considerations:

- | | | | |
|-----------------|-----------------------|----------------------------|---------------------------------------|
| • Documentation | • Objective survey | • Selection of cases and | • Parasitological confirmation |
| • Completeness | participant selection | controls | • Accuracy, completeness of records |
| | • Assessment of SMC | • Assessment of SMC | • Quality of information systems |
| | status | status | • Catchment area |
| | | • Resistance: sampling | • Effects of other interventions |
| | | and standardisation of lab | • Changes in policies |
| | | methods for molecular | • Variations due to climate, locality |
| | | markers | • Transmission intensity |

The idea behind the impact evaluation was to document carefully the process of drug delivery, the number of treatments and how they were administered; to measure, independently, the coverage, and equitability of the coverage, of the SMC programmes in each country; to determine the efficacy of each monthly SMC treatment (the amount of protection each treatment provides); and finally to estimate the impact in terms of the reduction in malaria cases and malaria deaths reported at health facilities in children under 5 years of age, when SMC programmes were scaled up. In the upper part of the diagram, the various factors that influence the impact of SMC are listed. And in the bottom half of the diagram we have listed the methodological considerations to ensure our measurements of the indicators are valid. We aimed to show that the impact observed is consistent with the number of treatments administered, the coverage achieved, and the efficacy of the treatments. Use of other interventions may have changed at the same time as SMC was introduced, it is difficult fully to allow for this confounding, but if we can show the impact observed is consistent with the mechanism that brought about the impact, we have more confidence that the impact is due to SMC, and if there are places where impact is more difficult to demonstrate, due to low coverage or poor surveillance, we have more confidence that the treatments delivered are giving the expected benefits.

The evaluation has been conducted with the following partners:

IRSS, Burkina Faso; CSSI, Chad; UGANC, Guinea; MRTC, Mali; CERMES, Niger; ERIC and JEDIMA, Nigeria; UCAD, Senegal; CAPM Morocco; TDR Geneva; WHO Geneva; the national malaria control programmes and pharmacovigilance centres in each country; WARN SMC Working Group; CRS; SUA; MSH; MMV; MC.

ACCESS-SMC evaluation: report on coverage surveys 2015-2016.

Background
Methods
Results
Conclusions
Annex 1
Annex 2

Background:

Each SMC treatment provides a high degree of protection for about 4 weeks. In the sub-Saharan belt stretching from southern Senegal and northern Guinea in the west to Chad and northern Cameroon in the east, the main risk period lasts for about 4 months. Four SMC treatments, if well timed, are sufficient to provide a high degree of protection. It is important that children receive treatment each month, and adhere to the treatment regimen, both to give them the most complete protection, and to keep to a minimum the number of children with lapsed protection in whom SMC drugs are present at low levels which would favour the development of drug resistance. SMC programmes therefore aim to achieve high coverage at each monthly "cycle". The average number of treatments received per child, the proportion of children who received the full four treatments, and the proportion who received at least three treatments, are key indicators of programme effectiveness. The accuracy of the timing of the first cycle in relation to the transmission seasons, and the average interval between cycles, are also key indicators. Safe and effective Administration of the dose of SP and the first dose of AQ should be supervised by the health worker after checking eligibility, selecting the right dose for the child's age, and respecting any contra-indications, and explaining to the caregiver how to administer the remaining doses of AQ. The concept of effective coverage includes adherence to these guidelines.

Methods:

Cluster sample surveys were undertaken at the end of each transmission season, communities were selected with probability proportional to estimated population, each selected community was mapped, divided into segments of approximately equal population, one segment chosen by simple random sampling, and all households in the selected segment included in the survey. In Mali, multistage sampling was used with districts selected with PPS in the first stage. In Nigeria in 2015, the survey was stratified by LGA. In Niger, a stratified survey was conducted in 4 districts chosen to be broadly representative of the areas where SMC was implemented. Children were included in the survey if they stayed in the house the night before the survey, and were aged at least three months at the last cycle, and under 7 years. This allowed estimates of coverage among children eligible to have received 4 treatments (those aged 3-59 months at the time of the first cycle), and among children too old to be eligible for SMC (children aged 5 years and above at the time of the

first cycle of that year). For each child, the caregiver was asked about the number of SMC treatments the child had received that season, and reasons for any missed treatments, and, for the most recent treatment, about adherence to the daily regimen. If the child had an SMC card the dates of treatments were transcribed from the card. SMC cards do not capture visits in which the child was seen by a health worker but did not receive treatment (for example a child who was unwell, was referred to the clinic, where they tested positive for malaria and were treated with ACT). Coverage surveys therefore sought to estimate the coverage of treatment, rather than of SMC contacts. (The latter could be estimated by using estimates of the proportion of children who were referred, from administrative data derived from tally sheets). A roster of all household members was made, bednet use by each person the night before was recorded, and caregivers were asked about household assets, and their level of education, age and other details were noted, and caregivers were asked about. Data were collected using Google Nexus tablet PCs using the Iform platform and uploaded to a server when the survey team reached an internet connection, permitting immediate analysis and reporting to inform planning for the next year's campaigns. The tablet software automatically selected the survey segment at random and, from 2017, the GPS location of each house visited was automatically recorded, and SMC cards were photographed. Data were analysed using the survey modules of Stata version 14. The primary indicators were the mean number of treatments per child, the proportion of children who received at least 1, at least three, and four treatments. Overall estimates for the ACCESS-SMC project were obtained by weighting country estimates by the target population.

In addition, to assess quality of delivery and adherence to SMC guidelines, a sample of community health workers and a sample of caregivers were interviewed immediately after SMC cycles, to ask both groups about the process of SMC administration, and the steps the health workers followed.

Results:

In 2015, 87% of children in ACCESS-SMC areas received at least one SMC treatment, 73% received at least 3 treatments, and 55% received four treatments. The overall mean number of treatments per child was 3.12, 78% of the full number of 4 treatments. The mean number ranged from 2.7 (Chad, Mali, Niger) to 3.7 in Burkina Faso (Table 1). Similar coverage was achieved in 2016 when the population covered by ACCESS-SMC was doubled (Table 2; Fig 1; Fig 2). The mean number of treatments per child was 2.9, 73% of the target of 4. Delivery was in general highly equitable, with similar levels of coverage across wealth rankings (Fig 3). Exceptions were Mali in 2015, where coverage was slightly lower in the poorest groups. Equitability improved in Mali in 2016 when the door to door delivery was more widely used. In Niger in 2015, coverage was lower in the richest group reflecting low coverage in urban areas where delivery was through fixed distribution points. In The Gambia, coverage was slightly lower in richer groups also reflecting lower coverage in more urban areas.

Reconciling survey estimates of coverage with administrative data: The number of children aged 5-8 years is about 75% of the number aged 3-59 months. If the coverage in this older group is, say, 50% of the coverage in the 3-59 months age group, the proportion of treatments administered to the under 5's is $1/(1+0.75 \times 0.5) = 73\%$. Administrative coverage should then be multiplied by 0.73 before comparing with survey estimates of coverage.

Updating the number of treatments required to achieve full coverage: If the survey estimate of the mean number of treatments per child is M, the number of treatments administered, as recorded on tally sheets, must increase by a factor of $4/M$, to achieve 100% coverage of 4 treatments. Overall in 2016 this means an increase of $4/2.9 = 1.38$, i.e. an increase of 38%. The required increase in each country would range from 8% (Burkina Faso) to 90% (Chad). (A buffer stock of about 20% on top of this is desirable to prevent local stock-outs due to errors in local estimates of the target population).

Comparison of survey estimates with SMC registers: The survey estimates were validated against treatment registers in Mali. Register data for 640,000 children were entered by CRS, giving accurate estimates of the proportion of children who received 1,2,3 or 4 treatments, among those who were reached by the programme. Survey estimates agreed closely with these figures. From the administration registers in Mali, the percentage of children who received at least 3 treatments, and the percentage who received 4 treatments, were 69% and 50% respectively, in 2015. The estimates from the survey were almost exactly the same, 70% and 51%. The coverage at cycle 1,2,3 and 4 was 88%, 79%, 72% and 64% from register data, the corresponding estimates from the survey, among those children who received SMC at least once, were 81%, 77%, 62% and 58%. Coverage was slightly lower at successive cycles, but the survey somewhat under-estimated the true coverage at cycles 3 and 4 (among those who were treated at least once). Estimating the coverage at each monthly cycle is more prone to error than estimating the number of cycles a child received, as the former relies on more accurate recording on the SMC card, and on more accurate recall by the caregiver.

The surveys showed that in several countries a high percentage of older children aged 6 to 7 years, are receiving SMC. Treatment above the upper age limit was less common in The Gambia, Mali and Niger, this may be linked to the level of training of the health workers, in The Gambia administration was linked to scanning of the child's SMC card using hand held devices, for which trained staff had been selected, and in Mali and Niger delivery was by mobile teams (Mali) or at distribution points (Niger) and involved some more highly trained staff than in other countries. Overall coverage was better in countries that primarily employed door-to-door delivery.

Table 1: Coverage of SMC in 2015

Country	Target	No. Surveyed (No. eligible)	Mean treatments per child (% of 4)	% with SMC card retained	% children treated at least once	% children slept under ITN last night	% children received at least 3 SMC cycles	% children received 4 SMC cycles	% of 6-7yr olds treated
Burkina Faso	707,317	1,070 (786)	3.7 (92%)	74%	96%	89%	91%	86%	82%
Chad	268,956	846 (707)	2.7 (68%)	68%	96%	81%	63%	24%	85%
Gambia	88,748	1,174 (690)	3.3 (82%)	90%	94%	72%	85%	56%	30%
Guinea	253,252	1,790 (1,258)	3.2 (79%)	61%	94%	83%	76%	57%	82%
Mali	875,330	1,037 (740)	2.7 (68%)	73%	87%	94%	62%	45%	17%
Niger	596,355	5,480 (4,127)	2.7 (67%)	56%	84%	91%	64%	48%	34%
Nigeria	860,497	1,380 (1,112)	3.3 (83%)	63%	77%	83%	77%	54%	61%
Overall	3,650,455	12,777 (9,420)	3.1 (78%)	67%	87%	87%	73%	55%	53%

Table 2: Coverage of SMC in 2016

Country	Target	No. Surveyed (No. eligible)	Mean treatments per child (% of 4)	% with SMC card retained	% children treated at least once	% children slept under ITN last night	% children received at least 3 SMC cycles	% children received 4 SMC cycles	% of 6-7yr olds treated
Burkina Faso	2,056,169	1,136 (874)	3.7 (91%)	67%	96%	97%	91%	86%	82%
Chad	514,042	1,328 (1,010)	2.1 (53%)	48%	92%	96%	40%	12%	61%
Gambia	90,925	1,706 (1,138)	2.6 (66%)	50%	81%	61%	64%	43%	11%
Guinea	438,123	2,612 (1,743)	3.5 (86%)	40%	96%	84%	83%	73%	79%
Mali	1,492,137	1,023 (799)	3.1 (78%)	33%	90%	97%	77%	57%	53%
Niger	1,050,932	5,340 (5,135)	3.1 (76%)	47%	91%	94%	72%	49%	43%
Nigeria	1,909,163	2,221 (1,662)	2.2 (55%)	48%	85%	38%	46%	21%	59%
Overall	7,551,491	15,366 (12,361)	2.9 (73%)	50%	91%	79%	70%	53%	62%
Nigeria*		1,265 (932)		41%	90%	34%	50%	30%	
Chad*		1,111 (797)		44%	90%	97%	39%	15%	

*LGAs or districts which delivered 4 cycles. In 2016, in Nigeria, cycle 1 was not implemented in some areas due to temporary shortage of drugs caused by delays in registration of dispersible tablets. In Chad, cycle 4 was not implemented in some areas due to shortage of drugs. Coverage for the areas which did deliver 4 cycles is shown.

Fig 1: Percentage of children reached by ACCESS-SMC (received at least one treatment)

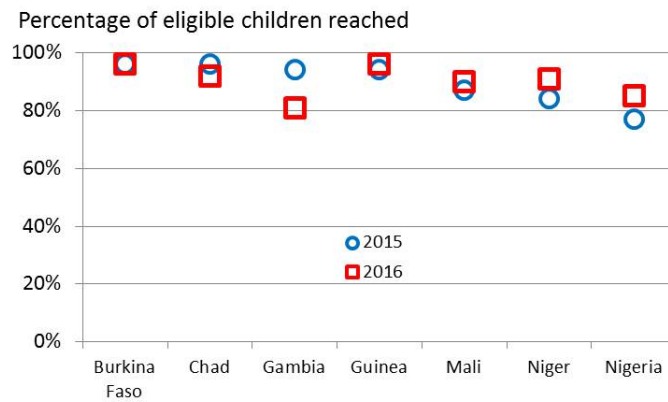


Fig 2: Mean number of treatments per child

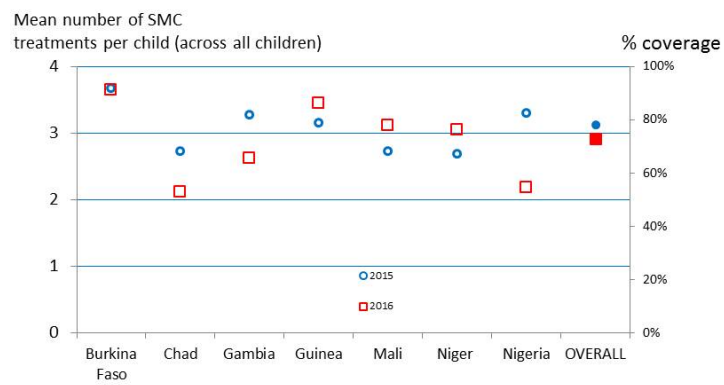
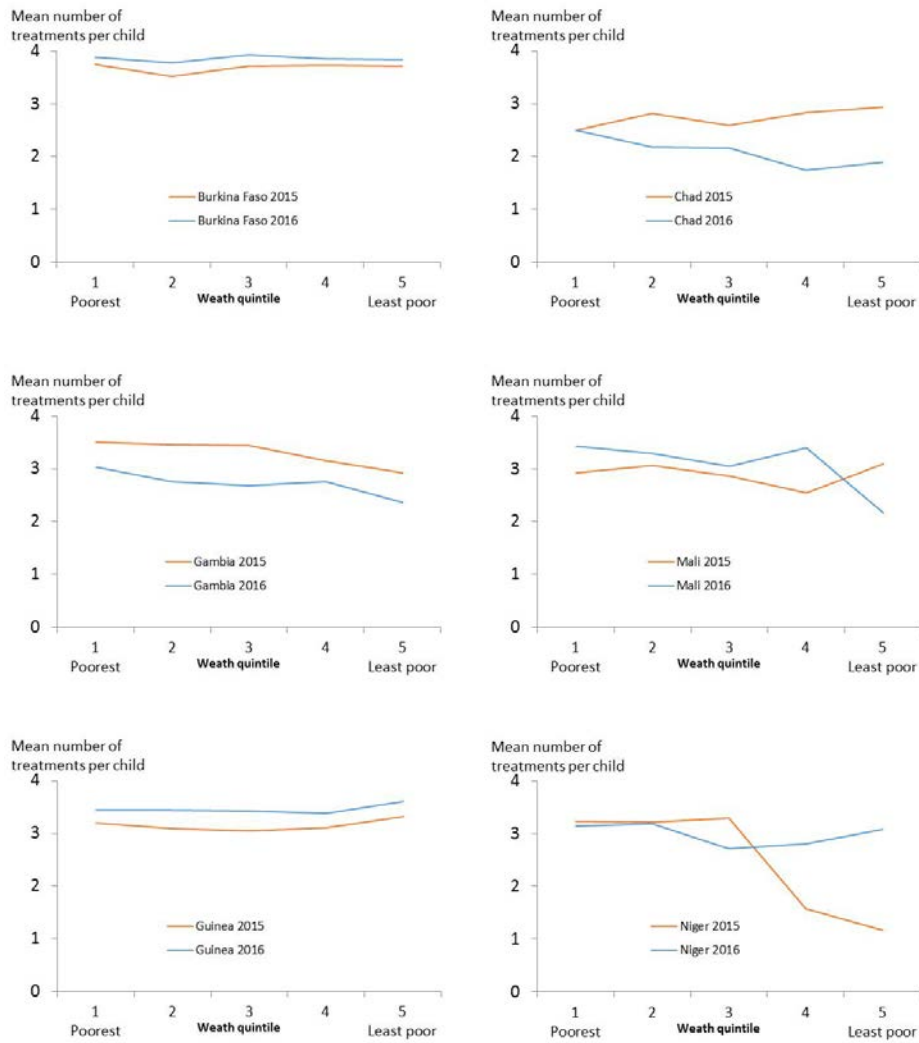
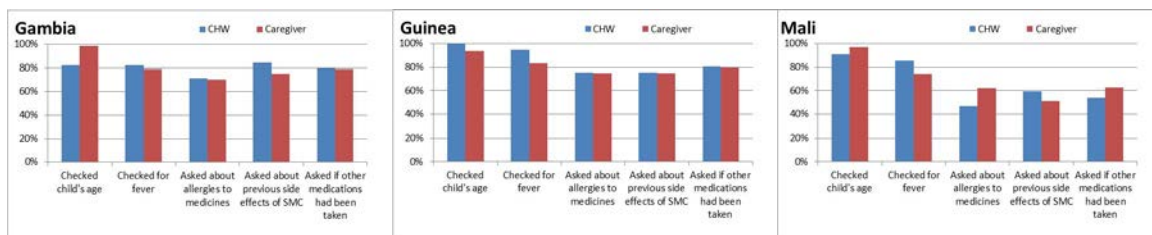


Fig 3: Equitability of SMC coverage: mean number of treatments, by wealth quintile.



Quality of SMC delivery: In 2016, interviews were conducted with a sample of caregivers and community health workers, 261 caregivers and 45 CHWs in The Gambia, 308 caregivers and 57 CHWs in Guinea, and 175 caregivers and 509 CHWs in Mali, to ask about their experiences of SMC, problems encountered, and the questions that health workers asked before administering SMC. Agreement between caregiver and CHW reports was good (Fig 4). Over 80% of CHWs checked age systematically from health cards or following criteria in the SMC guidelines and over 80% checked for the presence of fever, the last time they treated a child. Checking for history of allergies, and if the child had taken other medications, was more variable, 47% to 75% said they had asked about allergies, 59% to 84% had asked about previous side effects to SMC drugs, and 54% to 81% had checked whether the child had received other medications (antibiotics such as Bactrim, or SP) in the last month. In general the first dose was administered by the CHW. From 25% to 44% said they had, at some time in the past, left blister packs with the caregiver for children who were absent. From 7.7% to 11% % said they had knowingly treated children above the age of 5 years.

Fig 4: Checks made by the CHW during SMC administration, according to caregivers and according to the CHW



Conclusions:

High coverage has been achieved overall, with very high coverage in some areas showing coverage of 90% is feasible. Regional variations need to be addressed, the main reasons given by caregivers for not receiving SMC is that health workers did not visit. Survey results can be used to update estimates of the number of treatment packs required for full coverage to be possible. SMC delivery door to door is equitable. Adherence to unsupervised doses is difficult to verify but reported adherence was good and where blister packs could be inspected left-over medication was uncommon. Card completion by CHWs and card retention by caregivers was variable, making assessment more reliant on recall. Comparison of survey estimates of the number of treatments per child with register entries showed good agreement. CHWs generally followed key guidelines regarding assessment of the child's age group, referral of children who were unwell, and showing caregivers how to administer SMC drugs. Guidelines with regard to checking for allergies to SMC drugs and previous medicine intake were less consistently followed. A high proportion of children 5-7

years received SMC, this has to be taken into account when reconciling survey estimates of coverage with administrative data on number of treatments administered.

Coverage report: Annex 1

Table 1: Proportion of eligible children who received at least 3 SMC cycles by country and year of campaign and by wealth quintiles.

1a: Burkina Faso

Burkina Faso		2015			2016		
Wealth quintiles	N.	% who received at least 3 cycles of SMC		N.	% who received at least 3 cycles of SMC		
			95% CI			95% CI	
Poorest	66	94.17	[83.76,98.06]	164	98.1	[94.11,99.41]	
2	70	93.74	[83.43,97.81]	185	93.06	[84.11,97.14]	
3	82	99.05	[93.21,99.87]	173	98.31	[87.96,99.78]	
4	88	95.87	[89.64,98.42]	177	96.57	[90.14,98.86]	
Least poor	123	95.37	[76.85,99.22]	175	96	[89.37,98.56]	

1b: Chad

Chad		2015			2016		
Wealth quintiles	N.	% who received at least 3 cycles of SMC		N.	% who received at least 3 cycles of SMC		
			95% CI			95% CI	
Poorest	155	49.72	[32.72,66.79]	241	34.23	[22.83,47.8]	
2	139	67.42	[52.1,79.75]	155	33.74	[21.65,48.41]	
3	139	55.18	[40.14,69.32]	122	41.98	[24.68,61.5]	
4	142	70.44	[58.22,80.3]	127	43.95	[29.19,59.86]	
Least poor	132	75.11	[63.19,84.14]	158	51.34	[34.19,68.17]	

1c: Guinea

Guinea		2015			2016		
Wealth quintiles	N.	% who received at least 3 cycles of SMC		N.	% who received at least 3 cycles of SMC		
			95% CI			95% CI	
Poorest	252	74.79	[61.38,84.7]	219	73.23	[61.39,82.47]	
2	218	72.54	[61.22,81.55]	259	79.9	[73.51,85.07]	
3	272	66.05	[54.18,76.19]	214	77.52	[68.88,84.31]	
4	215	82.73	[71.17,90.29]	260	80.91	[73.44,86.66]	
Least	300	82.12	[73.58,88.34]	306	92.92	[88.81,95.59]	

poor

1d: Mali

Mali		2015			2016		
Wealth quintiles	N.	% who received at least 3 cycles of SMC	95% CI	N.	% who received at least 3 cycles of SMC	95% CI	
Poorest	126	54.35	[28.09,78.4]	262	87.44	[62.58,96.67]	
2	138	62.87	[36.99,83.01]	152	82.69	[58.69,94.14]	
3	129	69.35	[37.41,89.54]	152	74.16	[51.28,88.67]	
4	166	70.7	[53.87,83.29]	123	86.18	[57.61,96.62]	
Least poor	130	73.22	[56.04,85.43]	110	45.33	[27.22,64.77]	

1e: Niger

Niger		2015			2016		
Wealth quintiles	N.	% who received at least 3 cycles of SMC	95% CI	N.	% who received at least 3 cycles of SMC	95% CI	
Poorest	612	79.96	[70.45,86.97]	1030	75.91	[67.2,82.89]	
2	553	78.4	[71.35,84.11]	979	77.65	[69.91,83.86]	
3	623	85.01	[79.32,89.35]	967	63.55	[47.43,77.11]	
4	843	33.51	[24.9,43.38]	837	61.5	[41.75,78.07]	
Least poor	880	19.58	[14.21,26.35]	866	72.88	[63.77,80.4]	

*note 813 household has missing information on assets

1f: Nigeria

Nigeria		2015			2016		
Wealth quintiles	N.	% who received at least 3 cycles of SMC	95% CI	N.	% who received at least 3 cycles of SMC	95% CI	
Poorest	224	74.69	[60.51,85.04]	350	49.38	[34.89,63.98]	
2	232	82.68	[65.44,92.32]	376	41.94	[29.54,55.44]	
3	234	69.64	[55.83,80.63]	350	43.43	[30.56,57.26]	
4	215	76.87	[65.21,85.49]	359	39.13	[28.16,51.32]	
Least poor	177	80.99	[66.76,90.04]	330	40.13	[29.76,51.47]	

1h: The Gambia

Gambia		2015			2016		
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Wealth quintiles	N.	% who received at least 3 cycles of		N.	% who received at least 3 cycles of	
		SMC	95% CI		of SMC	95% CI
Poorest	95	92.07	[86.14,95.59]	170	76.23	[60.66,86.97]
2	107	84.28	[72.71,91.52]	209	67.89	[49.05,82.28]
3	118	91.16	[82.12,95.86]	179	65.07	[52.17,76.09]
4	118	86.82	[72.45,94.29]	272	66.3	[54.04,76.7]
Least poor	175	83.13	[72.32,90.29]	314	55.88	[44.28,66.86]

Table 2: Proportion of eligible children who received at least 3 SMC cycles by country and year of campaign and by area (region/district/LGA/prefecture).

2a: Burkina Faso

Burkina Faso	2015			2016		
	Region	N.	% who received at least 3 cycles of SMC 95% CI	N.	% who received at least 3 cycles of SMC 95% CI	95% CI
	Central North	255	97.34 [93.98,98.85]	111	100	0
	East	376	84.34 [70.87,92.26]	183	98.27	[89.16,99.75]
	Central Plateau	155	98.03 [87.19,99.73]	69	98.57	[92.83,99.73]
	Central East			215	92.5	[78.47,97.66]
	Central West			212	96.83	[90.38,99]
	Central South			84	93.81	[78.65,98.42]

2b: Chad

Chad	2015			2016		
	District	N.	% who received at least 3 cycles of SMC 95% CI	N.	% who received at least 3 cycles of SMC 95% CI	95% CI
	Bai-illi			19	36.84	[36.84,36.84]
	Bongor			99	48.55	[20.03,78.05]
	Bouso			41	63.67	[56.18,70.55]
	Dourbali	103	21.82 [8.261,46.37]	57	27.97	[10.15,57.16]
	Kouno			10	0	0
	Mandelia	145	69.28 [58.21,78.5]	51	44.41	[24.71,66.04]
	Mani	73	95.83 [85.86,98.86]	29	51.3	[34.41,67.9]
	Massaguet	95	84.08 [59.87,94.92]	46	33.26	[10.85,67.1]

Massakory	197	62.65	[45.66,77.01]	74	55.93	[38.07,72.39]
Massenya	94	53.79	[31.19,74.94]	36	80.68	[76.42,84.33]
N'Djamema Centre				113	28.25	[21.8,35.73]
N'Djamema Est				140	25.52	[8.564,55.63]
N'Djamema Nord				81	47.56	[26.41,69.63]
N'Djamema Sud				150	28.46	[8.354,63.45]

2c: Guinea

Guinea		2015		2016		
Prefecture	N.	% who received at least 3 cycles of SMC	95% CI	N.	% who received at least 3 cycles of SMC	95% CI
Dinguira	211	76.06	[61.31,86.44]	144	92.36	[87.7,95.35]
Gaoual	215	47.1	[38.23,56.16]	148	75.57	[45.85,91.87]
Koubia	152	80.65	[74.85,85.37]	71	86.1	[62.43,95.85]
Koundara	139	74.55	[61.1,84.52]	65	69.05	[43.63,86.54]
Mali	393	82.01	[75.55,87.05]	93	81.85	[58.3,93.57]
Tougue	148	86.31	[81.22,90.18]	51	98.28	[91.2,99.68]
Mandiana				323	84.02	[74.52,90.44]
Siguir				848	81.54	[77.11,85.27]

2d: Mali

Mali		2015		2016		
District	N.	% who received at least 3 cycles of SMC	95% CI	N.	% who received at least 3 cycles of SMC	95% CI
Bandiagara	160	60.14	[40.56,76.95]	162	94.89	[88.76,97.76]
Bla	145	54.92	[30.65,77.06]	143	92.41	[87.11,95.64]
Bougouni	149	62.29	[43.84,77.75]	169	77.77	[67.89,85.28]
Diema	146	52.03	[27.42,75.69]	165	58.54	[42.72,72.78]
Kati	140	80.29	[70.42,87.45]	160	53.89	[32.04,74.33]

2e: Niger

Niger		2015		2016		
District	N.	% who received at least 3 cycles of SMC	95% CI	N.	% who received at least 3 cycles of SMC	95% CI

Aguie	1057	82.44	[72.8,89.17]	1295	75.19	[63.33,84.18]
Madaoua	1076	79.58	[71.64,85.74]	1212	70.38	[59.64,79.25]
Maradi	1083	9.873	[5.316,17.61]	1185	71.14	[63.39,77.83]
Zinder	911	13.15	[8.971,18.88]	1147	48.8	[41.36,56.3]

2f: Nigeria

Nigeria		2015		2016		
District	N.	% who received at least 3 cycles of SMC	95% CI	N.	% who received at least 3 cycles of SMC	95% CI
Sokoto	521	54.35	[45.8,62.65]	1009	33.04	[22.51,45.59]
Zamfara	561	86.61	[77.7,92.31]	844	55.07	[41.84,67.62]

2h: The Gambia

Gambia		2015		2016		
LGAs	N.	% who received at least 3 cycles of SMC	95% CI	N.	% who received at least 3 cycles of SMC	95% CI
Kuntaur (CRR)	80	88.59	[71.11,96.08]	708	63.07	[44.85,78.19]
Janjanburay (CRR)	199	94.47	[91.33,96.52]	315	67.37	[54.89,77.79]
Basse (URR)	411	79.99	[71.84,86.24]	121	64.99	[54.52,74.2]

Coverage report: Annex 2:
Summary reports on coverage surveys



Seasonal Malaria Chemoprevention in Burkina Faso

Coverage Summary Report 2015

Background: Seasonal Malaria Chemoprevention supported by the ACCESS-SMC project was introduced in 11 health districts in Burkina Faso in 2015. In 2015, the first of four monthly cycles of SMC was carried out in late July/early August, and the final cycle took place in November. It is important the SMC programme is monitored to ensure the intervention is delivered effectively reaching the children that need it. WHO recommends that children should receive all four monthly cycles, and should adhere to the treatment dose each month, in order to maximise protection and minimise selection for drug resistance. As part of the monitoring of the SMC programme in Burkina Faso, a coverage survey was carried out in late December/early January by Institute de Recherche en Sciences de la Sante (IRSS) with support from the London School of Hygiene & Tropical Medicine, to determine the proportion of children that received each monthly treatment, and to ask about adherence to the treatment doses, and reasons for missed treatments.

Key messages:

The reach of the SMC programme in Burkina Faso has been excellent, with 95% of children having received an SMC card and at least one cycle of SMC.

This compares with 89% of eligible children who slept under an insecticide treated net the night before the survey (although it should be noted that the survey took place in mid December 2015, so net use may be lower than at the peak of the transmission season).

Retention of the SMC card was almost 78% among those issued with a card, which facilitates evaluation of the programme, but leaves some uncertainty for those who without a card at the time of the survey.

Around 84% of eligible children received at least 3 cycles of SMC, 69% received all 4 cycles.

Coverage of the first cycle appears to be highest, with coverage at the final cycle in November having the lowest coverage at 68%..

It is important to ensure that children too old for the SMC programme do not receive SMC, the dose is designed for children under 5 years of age, older children receiving this dose will not be fully protected. Some treatment outside the recommended age range is inevitable, but it is important this is kept to a minimum.

Key indicators 2015:

Number surveyed who were eligible for all 4 SMC cycles	786
Slept under a bednet last night	88.7%
Received an SMC card	94.6%
<i>Confirmed by card if available, otherwise from caregiver recall:</i>	
Received at least one cycle	95.8%
Received at least 3 cycles	83.9%
Received all 4 cycles	69.2%
Received no SMC	3.1%
For those that had SMC at the last cycle, adherence to all 3 doses	97.2%
Children 6-7yrs old who received SMC at least once	81.9%

Methods: Within the areas implementing SMC in 2015 supported by the ACCESS-SMC project, 50 settlements were selected from the list of all settlements with probability proportional to population size (PPS sampling). A random sample of approximately 20 children per village was then taken. The survey included eligible children (SMC is given to children aged at least 3 months, and who were less than 5 years old at the first cycle). The survey also included older children up to 7 years of age in order to determine how many of these older children were being treated. Call-backs were done if the caregiver was absent. The caregiver was asked about the number of SMC treatments the child received and in which months SMC was given, and the SMC record card was inspected to record the dates of treatments on the card. Data were collected using tablet PCs.

More details on Key indicators: 1070 children were included in the survey, 786 of these were eligible to receive all 4 cycles of SMC in 2015 based on their age at the time of the first SMC cycle. Around 95% of eligible children received an SMC card and received at least one cycle of SMC. If an SMC card was received, approximately 78% of children retained the card for inspection. Based on the card (where available, and on recall of the monthly cycles, or the number of blister packs received otherwise), 84% of eligible children received at least 3 cycles of SMC, and 69% received all 4 cycles. Coverage of the individual cycles is more difficult to estimate because this relies on documentation of dates on the card, or recall of dates of treatment, both of which are likely to be imperfect. However, even allowing for these issues, it appears that coverage of the third and fourth cycles of SMC, at 83% and 68% respectively, is lower than the first 2 cycles.

Reported adherence to the three day course of SMC was excellent, with 97% of those who had received SMC reporting that the full course was given.

Of 105 children aged between 6 and 7 years who should not receive SMC, 81 (77%) had received an SMC card, and 86 (82%) of caregivers reported that the child had received at least one SMC cycle, with about 71% reporting that the child had received at least 3 cycles.

Report compiled by M Cairns, P Milligan, Issaka Zongo and Jean Bosco Ouedraogo. May 11 2016. Contact zongo_issaka@yahoo.fr for further information.

Table: Key indicators of SMC Coverage – Burkina Faso

Number children 3m–7 years included	1070					
Number eligible for all 4 SMC cycles [§]	786					
	n/N	%	95% Confidence Interval			
Slept under a bednet last night	692/781	88.7	[81.8, 93.2]			
Received SMC card	742/784	94.6	[89.2, 97.4]			
Retained card if card received	579/740	77.8	[67.1, 85.7]			
Received SMC cycle 1	733/786	93.7	[89.2, 96.4]			
Received SMC cycle 2	689/786	87.9	[80.4, 92.8]			
Received SMC cycle 3	644/786	82.0	[74.0, 87.9]			
Received SMC cycle 4	547/786	68.4	[57.5, 77.6]			
	Confirmed by card if available, otherwise recall [^]			Maximum by card / recall		
No. of SMC cycles	n/N	%	95% Confidence Interval	n/N	%	95% Confidence Interval
0	36/786	4.2	[2.0, 8.9]	26/786	3.1	[1.4, 6.8]
1	43/786	5.6	[2.3, 13.2]	23/786	3	[0.8, 10.3]
2	49/786	6.2	[3.7, 10.2]	21/786	2.6	[1.4, 5.0]
3	106/786	14.7	[8.0, 25.4]	40/786	4.9	[2.8, 8.7]
4	552/786	69.2	[58.7, 78.1]	676/786	86.4	[78.8, 91.5]
Received no SMC*	26/786	3.1	[1.4, 6.8]	-	-	-
Received at least one cycle	750/786	95.8	[91.1, 98.0]	750/786	95.8	[91.1, 98.0]
Received at least 3 cycles	658/786	83.9	[75.7, 89.7]	716/786	91.3	[84.2, 95.4]
Received all 4 cycles	552/786	69.2	[58.7, 78.1]	676/786	86.4	[78.8, 91.5]

Percentages are survey -weighted and will not equate to n/N. [§] aged at least 3 months at time of first cycle, and under 5 years at time of survey. * this is confirmed as no receipt, rather than failure to indicate receipt:

Seasonal Malaria Chemoprevention in Chad

Coverage Summary Report 2015

Background: Seasonal Malaria Chemoprevention was introduced in 6 districts in Chad in 2015 (Dourbali, Mandelia, Mani, Massaguet, Massakory and Massenya), supported by UNITAID and MoH Chad. In 2015, the first of four monthly cycles of SMC was carried out in late July/early August, and the final cycle took place in late October. It is important the SMC programme is monitored to ensure the intervention is delivered effectively reaching the children that need it. WHO recommends that children should receive all four monthly cycles, and should adhere to the treatment dose each month, in order to maximise protection and minimise selection for drug resistance. As part of the monitoring of the SMC programme in Chad, a coverage survey was carried out in late December/early January by Centre de Support en Santé Internationale with support from the London School of Hygiene & Tropical Medicine, to determine the proportion of children that received each monthly treatment, and to ask about adherence to the treatment doses, and reasons for missed treatments.

Key messages:

The reach of the SMC programme in Chad has been good, with 82% of children having received an SMC card. A higher percentage of caregivers recalled that their child had received at least one SMC cycle.

This compares with 81% of eligible children who slept under an insecticide treated net the night before the survey (although it should be noted that the survey took place in late December 2015/early January 2016; net use may be lower than at the peak of the transmission season).

Retention of the SMC card was almost 83%, which facilitates evaluation of the programme, but leaves some uncertainty for those who without a card at the time of the survey.

Around 60% of eligible children received at least 3 cycles of SMC, but only 23% received all 4 cycles.

Coverage of the first two cycles appears to be higher than the third and fourth cycles, with the final cycle in particular (in late October) having low coverage.

It is important to ensure that children too old for the SMC programme do not receive SMC, the dose is designed for children under 5 years of age, older children receiving this dose will not be fully protected. Some treatment outside the recommended age range is inevitable, but it is important this is kept to a minimum.

Key indicators 2015:

Number surveyed who were eligible for all 4 SMC cycles	707
Slept under a bednet last night	81.4%
Received an SMC card	82.1%
<i>Confirmed by card if available, otherwise from caregiver recall:</i>	
Received at least one cycle	96.0%
Received at least 3 cycles	60.5%
Received all 4 cycles	22.7%
Received no SMC	3.8%
For those that had SMC at the last cycle, adherence to all 3 doses	96.0%
Children 6-7yrs old who received SMC at least once	85.0%

Methods: Within the areas implementing SMC in 2015 supported by the ACCESS-SMC project, 60 settlements were selected from the list of all settlements with probability proportional to population size (PPS sampling). A random sample of 14 children per village was then taken. The survey included eligible children (SMC is given to children aged at least 3 months, and who were less than 5 years old at the first cycle). The survey also included older children up to 7 years of age in order to determine how many of these older children were being treated. Call-backs were done if the caregiver was absent. The caregiver was asked about the number of SMC treatments the child received and in which months SMC was given, and the SMC record card was inspected to record the dates of treatments on the card. Data were collected using tablet PCs.

More details on Key indicators: 846 children were included in the survey, 707 of these were eligible to receive all 4 cycles of SMC in 2015 based on their age at the time of the first SMC cycle. Around 82% of children received an SMC card and thus are very likely to have received at least one cycle of SMC. If an SMC card was received, approximately 83% of children retained the card for inspection. Based on the card (where available, and on recall of the monthly cycles, or the number of blister packs received otherwise), 60% of eligible children received at least 3 cycles of SMC, and approximately 23% received all 4 cycles. Coverage of the individual cycles is more difficult to estimate because this relies on documentation of dates on the card, or recall of dates of treatment, both of which are likely to be imperfect. However, even allowing for these issues, it does appear that coverage of the final cycle of SMC, at around 28%, is lower than the first 3 cycles.

Reported adherence to the three day course of SMC was excellent, with 96% of those who had received SMC reporting that the full course was given.

Of 68 children aged between 6 and 7 years who should not receive SMC, 43 (63%) had received an SMC card, and 58 (85%) of caregivers reported that the child had received at least one SMC cycle, with about 67% reporting that the child had received at least 3 cycles.

Report compiled by M Cairns, P Milligan, Kessely Hamit, Daugla Doumagoum, Jean Pierre Gami. May 18 2016. Contact hkessely@yahoo.fr for further information.

Table: Key indicators of SMC Coverage – Chad

Number children 3m–7 years included	846					
Number eligible for all 4 SMC cycles [§]	707					
	n/N	%	95% Confidence Interval			
Slept under a bednet last night	578/707	81.4	[75.6, 86.0]			
Received SMC card	580/707	82.1	[73.2, 88.5]			
Retained card if card received	478/580	82.7	[75.6, 88.1]			
Received SMC cycle 1	618/707	87.5	[81.7, 91.6]			
Received SMC cycle 2	575/707	81.2	[74.6, 86.4]			
Received SMC cycle 3	447/707	63.0	[53.7, 71.5]			
Received SMC cycle 4	200/707	28.3	[20.4, 37.7]			
	Confirmed by card if available, otherwise recall [^]			Maximum by card / recall		
No. of SMC cycles	n/N	%	95% Confidence Interval	n/N	%	95% Confidence Interval
0	28/707	4.0	[1.8, 8.4]	27/707	3.8	[1.7, 8.3]
1	54/707	7.5	[4.3, 13.0]	45/707	6.3	[3.4, 11.4]
2	197/707	28	[20.8, 36.5]	188/707	26.6	[19.6, 35.1]
3	268/707	37.8	[30.0, 46.2]	278/707	39.3	[31.5, 47.6]
4	116/707	22.7	[15.6, 31.8]	169/707	24.0	[16.8, 33.1]
Received no SMC*	27/707	3.8	[1.7, 8.3]	-	-	-
Received at least one cycle	679/707	96.0	[91.6, 98.2]	679/707	96.0	[91.6, 98.2]
Received at least 3 cycles	428/707	60.5	[50.9, 69.3]	447/707	63.2	[54.0, 71.6]
Received all 4 cycles	160/707	22.7	[15.6, 31.8]	169/707	24.0	[16.8, 33.1]

Percentages survey -weighted and will not equate to n/N. [§] aged at least 3 months at time of first cycle, and under 5 years at time of survey. [^] recall of number of blister packs received. * this is confirmed as no receipt, rather than failure to indicate receipt: 3 children had an SMC card, but no cycles were recorded on the card.

Seasonal Malaria Chemoprevention in The Gambia

Coverage Summary Report 2015

Background: Seasonal Malaria Chemoprevention was introduced in The Gambia in 2014 in Central River Region, supported by UNICEF, and scaled up in 2015 to include about 92000 children in Upper and Central River regions, supported by UNITAID through the ACCESS-SMC project. In 2015 the first of four monthly cycles of SMC was carried out in mid-late August, and the final cycle took place in mid-late November. It is important the SMC programme is monitored to ensure the intervention is delivered effectively reaching the children that need it. WHO recommends that children should receive all four monthly cycles, and should adhere to the treatment does each month, in order to maximise protection and minimise selection for drug resistance. As part of the monitoring of the SMC programme in The Gambia, a coverage survey was carried out in early-mid February 2016 by MRC in collaboration with the NMCP with support from the London School of Hygiene&Tropical Medicine and the Central Statistics Department, to determine the proportion of children that received each monthly treatment, and to ask about adherence to the treatment doses, and reasons for missed treatments.

Key messages:

The reach of the SMC programme in the Gambia has been excellent, with around 95% of children having received an SMC card and at least one SMC cycle.

This compares with 71.5% of eligible children who slept under an insecticide treated net the night before the survey (although it should be noted that the survey took place in the dry season in February 2016).

Retention of the SMC card was very good which facilitates evaluation of the programme.

Over 84% of eligible children received at least 3 cycles of SMC, and approximately 56% received all 4 cycles.

Coverage of the first two cycles appears to be slightly higher than the third and fourth cycles, with the final cycle in particular having lower coverage.

It is important to ensure that children too old for the SMC programme do not receive SMC, the dose is designed for children under 5 years of age, older children receiving this dose will not be fully protected. Some treatment outside the recommended age range is inevitable, but it is important this is kept to a minimum.

Key indicators 2015:

Number surveyed who were eligible for all 4 SMC cycles	690
Slept under a bednet last night	71.5%
Received an SMC card	93.9%
<i>Confirmed by card if available, otherwise from caregiver recall:</i>	
Received at least one cycle	93.7%
Received at least 3 cycles	84.3%
Received all 4 cycles	55.5%
Received no SMC	5.8%
For those that had SMC at the last cycle, adherence to all 3 doses	98%
<hr/>	
Children 6-7yrs old who received SMC at least once	30%

Methods: 50 settlements within Central River Region and Upper River Region were selected from the list of all settlements with probability proportional to population size (PPS sampling). Compact segment sampling was then used to select a sample of about 1000 children. The survey included eligible children (SMC is given to children aged at least 3 months, and who were less than 5 years old at the first cycle). The survey also included older children up to 7 years of age in order to determine how many of these older children were being treated. In the selected villages/towns, a sketch map of the area was divided into segments with approximately 100 total population in each segment. One segment was then selected at random, and all the eligible children, and those up to 7 year of age, living in the segment were then included in the survey. Call-backs were done if the caregiver was absent. The caregiver was asked about the number of SMC treatments the child received and the months, and the SMC record card was inspected to record the dates of treatments on the card. Data were collected using tablet PCs.

More details on Key indicators: 1174 children were included in the survey, 690 of these were eligible to receive all 4 cycles of SMC in 2015 based on their age at the time of the first SMC cycle. Around 94% of children received an SMC card and received at least one cycle of SMC. If an SMC card was received, over 95% of children retained the card for inspection. Based on the card (where available, and on recall of the number of blister packs received otherwise), over 84% received at least 3 cycles of SMC, and approximately 56% received all 4 cycles. Coverage of the individual cycles is more difficult to estimate because this relies on documentation of dates on the card, or recall of dates of treatment, both of which are likely to be imperfect. However, even allowing for these issues, it does appear that coverage of the final cycle of SMC, at around 54%, is lower than the first 3 cycles.

Reported adherence to the three day course of SMC was excellent, with over 98% of those who had received SMC reporting that the full course was given.

Of 302 children aged between 6 and 7 years who should not receive SMC, around 30% reported receiving at least one SMC cycle, with about 25% of these reporting receiving at least 3 cycles.

Report compiled by M Cairns, S Ceesay, P Milligan May 6 2016. Contact S Ceesay (sicesay@mrc.gm) for further information.

Table: Key indicators of SMC Coverage – the Gambia

Number children 3m–7 years included	1174					
Number eligible for all 4 SMC cycles [§]	690					
	n/N	%	95% Confidence Interval			
Slept under a bednet last night	485/689	71.5	[62.4, 79.1]			
Received SMC card	643 / 689	93.9	[90.2, 96.2]			
Retained card if card received	612 / 642	95.5	[89.4, 98.2]			
Received SMC cycle 1	583/690	85.3	[77.3, 90.8]			
Received SMC cycle 2	579/690	84.1	[76.3, 89.7]			
Received SMC cycle 3	527/690	76.9	[68.0, 83.9]			
Received SMC cycle 4	360/690	53.9	[43.0, 64.5]			
	Confirmed by card if available, otherwise recall [^]			Maximum by card / recall		
No. of SMC cycles	n/N	%	95% Confidence Interval	n/N	%	95% Confidence Interval
0	47/690	6.3	[4.1, 9.6]	44/690	5.8	[3.9, 8.6]
1	14/690	2.1	[1.0, 4.6]	14/690	2.1	[1.0, 4.6]
2	49/690	7.3	[4.3, 12.2]	48/690	7.2	[4.2, 12.0]
3	211/690	28.8	[20.8, 38.3]	211/690	28.8	[20.9, 38.2]
4	369/690	55.5	[45.6, 64.9]	373/690	56.1	[46.4, 65.4]
Received no SMC*	44/690	5.8	[3.9, 8.6]	-	-	-
Received at least one cycle	643/690	93.7	[90.4, 95.9]	643/690	93.7	[90.4, 95.9]
Received at least 3 cycles	580/690	84.3	[78.1, 88.9]	584/690	84.9	[79.2, 89.2]
Received all 4 cycles	369/690	55.5	[45.6, 64.9]	373/690	56.1	[46.4, 65.4]

Percentages survey -weighted and will not equate to n/N. [§] aged at least 3 months at time of first cycle, and under 5 years at time of survey. [^] recall of number of blister packs received. * this is confirmed as no receipt, rather than failure to indicate receipt: 3 children had an SMC card, but no cycles were recorded on the card.



Seasonal Malaria Chemoprevention in Guinea

Coverage Summary Report 2015

Background: Seasonal Malaria Chemoprevention supported by the ACCESS-SMC project was introduced in 2015 in six prefectures (Gaoual, Koundara, Mali, Koubia, Tougue and Dinguiraye) in the Republic of Guinea. In 2015, the first of four monthly cycles of SMC was carried out in July, and the final cycle took place in October. It is important that the SMC programme is monitored to ensure the intervention is delivered effectively, reaching the children that need it. WHO recommends that children should receive all four monthly cycles, and should adhere to the treatment dose each month, in order to maximise protection and minimise selection for drug resistance. As part of the monitoring of the SMC programme in Guinea, a coverage survey was carried out in January 2016 by University of Gamal of Conakry with support from the London School of Hygiene & Tropical Medicine, to determine the proportion of children that received each monthly treatment, and to ask about adherence to the treatment doses, and reasons for missed treatments.

Key messages:

The reach of the SMC programme in Guinea has been good, with 91% of children having received an SMC card, and 94% having received at least one cycle of SMC (confirmed by card where possible, and otherwise by recall of mother / caregiver).

This compares with 84% of eligible children who slept under an insecticide treated net the night before the survey. However, it should be noted that the survey took place in mid January 2016, so net use may be lower than during the peak of the malaria transmission season.

Retention of the SMC card was 68% among those issued with a card, which leaves some uncertainty for those who without a card at the time of the survey.

Around 72% of eligible children received at least 3 cycles of SMC, and 54% received all 4 cycles.

Coverage of the first cycles in July and August appears to be highest, with coverage above 80%. Coverage at the final cycle in October had the lowest coverage, at 58%..

It is important to ensure that children too old for the SMC programme do not receive SMC, the dose is designed for children under 5 years of age, older children receiving this dose will not be fully protected. Some treatment outside the recommended age range is inevitable, but it is important this is kept to a minimum.

Key indicators 2015:

Number surveyed who were eligible for all 4 SMC cycles	1258
Slept under a bednet last night	83.4%
Received an SMC card	90.9%
<i>Confirmed by card if available, otherwise from caregiver recall:</i>	
Received at least one cycle	94.2%
Received at least 3 cycles	71.6%
Received all 4 cycles	53.6%
Received no SMC	4.9%
For those that had SMC at the last cycle, adherence to all 3 doses	94.3%
Children 6-7yrs old who received SMC at least once	81.9%

Methods: Within the 6 prefectures implementing SMC in 2015 supported by the ACCESS-SMC project, 50 settlements were selected from the list of all settlements with probability proportional to population size (PPS sampling). A random sample of approximately 20 households per village was then taken. The survey included eligible children (SMC is given to children aged at least 3 months, and who were less than 5 years old at the first cycle). The survey also included older children up to 7 years of age in order to determine how many of these older children were being treated. Call-backs were done if the caregiver was absent. The caregiver was asked about the number of SMC treatments the child received and in which months SMC was given, and the SMC record card was inspected to record the dates of treatments on the card. Data were collected using tablet PCs.

More details on Key indicators: 1790 children were included in the survey, 1258 of these were eligible to receive all 4 cycles of SMC in 2015 based on their age at the time of the first SMC cycle. Around 91% of eligible children received an SMC card and received at least one cycle of SMC. If an SMC card was received, approximately 68% of children retained the card for inspection. Based on the card (where available, and on recall of the number of blister packs received otherwise), 72% of eligible children received at least 3 cycles of SMC, and 54% received all 4 cycles. Coverage of the individual cycles is more difficult to estimate because this relies on documentation of dates on the card, or recall of dates of treatment, both of which are likely to be imperfect. However, even allowing for these issues, it appears that coverage of the third and fourth cycles of SMC, at 73% and 58% respectively, is lower than the first 2 cycles, where coverage was slightly over 80%.

Reported adherence to the three day course of SMC was very good, with 94% of those who had received SMC reporting that the full course was given.

Of 212 children aged between 6 and 7 years who should not receive SMC, 170 (82%) had received an SMC card, and 82% of caregivers reported that the child had received at least one SMC cycle, with about 45% reporting that the child had received at least 3 cycles.

Report compiled by M Cairns, P Milligan, Kovana Marcel Loua, June 2016. Contact Dr Kovana Marcel Loua for further information (louakovanamarcel@gmail.com).

Table: Key indicators of SMC Coverage – Guinea

Number children 3m–7 years included	1790					
Number eligible for all 4 SMC cycles [§]	1258					
	n/N	%	95% Confidence Interval			
Slept under a bednet last night	1048/1257	83.4	[79.6, 86.7]			
Received SMC card	1174/1257	90.9	[86.4, 94.0]			
Retained card if card received	802/1174	67.6	[56.8, 76.9]			
Received SMC cycle 1	1075/1258	83.1	[73.9, 89.5]			
Received SMC cycle 2	1035/1258	82.2	[77.9, 85.8]			
Received SMC cycle 3	897/1258	72.8	[67.2, 77.7]			
Received SMC cycle 4	740/1258	58.2	[48.6, 67.2]			
	Confirmed by card if available, otherwise recall [^]			Maximum by card / recall		
Number of SMC cycles received	n/N	%	95% Confidence Interval	n/N	%	95% Confidence Interval
0	44/1258	5.8	[3.3, 9.9]	36/1258	4.9	[2.6, 9.0]
1	162/1258	11.3	[7.1, 17.3]	121/1258	7.6	[4.3, 13.0]
2	166/1258	11.4	[8.2, 15.6]	166/1258	11.8	[8.4, 16.3]
3	202/1258	17.9	[10.6, 28.6]	209/1258	19	[10.6, 31.5]
4	684/1258	53.6	[42.4, 64.5]	726/1258	56.8	[44.8, 68.0]
Received no SMC*	36/1258	4.9	[2.6, 9.0]	-	-	-
Received at least one cycle	1214/1258	94.2	[90.1, 96.7]	1214/1258	94.2	[90.1, 96.7]
Received at least 3 cycles	886/1258	71.6	[65.6, 76.9]	935/1258	75.8	[70.1, 80.7]
Received all 4 cycles	684/1258	53.6	[42.4, 64.5]	726/1258	56.8	[44.8, 68.0]

Percentages are survey -weighted and will not equate to n/N. [§] aged at least 3 months at time of first cycle, and under 5 years at time of survey. * this is confirmed as no receipt, rather than failure to indicate receipt:

Seasonal Malaria Chemoprevention in Mali

Coverage Summary Report 2015

Background: Seasonal Malaria Chemoprevention supported by the ACCESS-SMC project was introduced in 14 health districts in Mali in 2015. In 2015, the first of four monthly cycles of SMC was carried out in late August /early September, and the final cycle took place in late November / early December. It is important the SMC programme is monitored to ensure the intervention is delivered effectively reaching the children that need it. WHO recommends that children should receive all four monthly cycles, and should adhere to the treatment dose each month, in order to maximise protection and minimise selection for drug resistance. As part of the monitoring of the SMC programme in Mali, a coverage survey was carried out in late December/early January by MRTC with support from the London School of Hygiene & Tropical Medicine, to determine the proportion of children that received each monthly treatment, and to ask about adherence to the treatment doses, and reasons for missed treatments.

Key messages:

The reach of the SMC programme in Mali has been good, with 86% of children having received an SMC card and at least one cycle of SMC. This compares with 94% of eligible children who slept under an insecticide treated net the night before the survey.

Retention of the SMC card was almost 84% among those issued with a card, which facilitates evaluation of the programme, but leaves some uncertainty for those without a card at the time of the survey.

Around 56% of eligible children received at least 3 cycles of SMC, 38% received all 4 cycles.

Coverage of the first cycle appears to be highest at around 70%, with coverage at the final cycle in November having the lowest coverage at 50%.

It is important to ensure that children too old for the SMC programme do not receive SMC, the dose is designed for children under 5 years of age, older children receiving this dose will not be fully protected. Some treatment outside the recommended age range is inevitable, but it is important this is kept to a minimum. Mali has done very well at this compared to other countries introducing SMC.

Key indicators 2015:

Number surveyed who were eligible for all 4 SMC cycles	740
Slept under a bednet last night	94.1%
Received an SMC card	86.3%
<i>Confirmed by card if available, otherwise from caregiver recall:</i>	
Received at least one cycle	87.2%
Received at least 3 cycles	56.2%
Received all 4 cycles	37.7%
Received no SMC	11.7%
For those that had SMC at the last cycle, adherence to all 3 doses	99.2%
Children 6-7yrs old who received SMC at least once	16.5%

Methods: Within the areas implementing SMC in 2015 supported by the ACCESS-SMC project, 5 districts were selected with probability proportional to size (PPS sampling). Five (5) settlements were then selected from the list of all settlements in the district, also by PPS sampling. Within each settlement, the area was divided into census enumeration areas, and the enumeration area divided into segments containing approximately 100 individuals. Within each segment, a random sample of approximately 20 children was then taken. The survey included eligible children (SMC is given to children aged at least 3 months, and who were less than 5 years old at the first cycle). The survey also included older children up to 7 years of age in order to determine how many of these older children were being treated. Call-backs were done if the caregiver was absent. The caregiver was asked about the number of SMC treatments the child received and in which months SMC was given, and the SMC record card was inspected to record the dates of treatments on the card. Data were collected using tablet PCs.

More details on Key indicators: 1037 children were included in the survey, 740 of these were eligible to receive all 4 cycles of SMC in 2015 based on their age at the time of the first SMC cycle. Around 86% of eligible children received an SMC card and received at least one cycle of SMC. If an SMC card was received, approximately 84% of children retained the card for inspection. Based on the card (where available, and on recall of the monthly cycles, or the number of blister packs received otherwise), 56% of eligible children received at least 3 cycles of SMC, and 38% received all 4 cycles. Coverage of the individual cycles is more difficult to estimate because this relies on documentation of dates on the card, or recall of dates of treatment, both of which are likely to be imperfect. However, even allowing for these issues, it appears that coverage of the third and fourth cycles of SMC, at 54% and 50% respectively, is lower than the first 2 cycles, where coverage was 70% and 67%.

Reported adherence to the three day course of SMC was excellent, with 99% of those who had received SMC reporting that the full course was given.

Of 151 children aged between 6 and 7 years who should not receive SMC, 20 (13%) had received an SMC card, and 25 (16%) of caregivers reported that the child had received at least one SMC cycle, with about 11% reporting that the child had received at least 3 cycles.

Report compiled by M Cairns, P Milligan, Issaka Sagara and Alassane Dicko May 12 2016. Contact Dr. Issaka Sagara isagara@icermali.org for further information.

Table: Key indicators of SMC Coverage – Mali

Number children 3m–7 years included	1037					
Number eligible for all 4 SMC cycles [§]	740					
	n/N	%	95% Confidence Interval			
Slept under a bednet last night	697/740	94.1	[87.5, 97.3]			
Received SMC card	634/740	86.3	[74.2, 93.3]			
Retained card if card received	529/634	84.1	[73.6, 90.9]			
Received SMC cycle 1	525 /740	69.7	[56.7, 80.2]			
Received SMC cycle 2	484 /740	66.8	[53.3, 78.0]			
Received SMC cycle 3	386 /740	53.8	[37.3, 69.6]			
Received SMC cycle 4	354 /740	49.8	[33.7, 66.0]			
	Confirmed by card if available, otherwise recall [^]			Maximum by card / recall		
No. of SMC cycles	n/N	%	95% Confidence Interval	n/N	%	95% Confidence Interval
0	98/740	12.8	[6.0, 25.1]	89/740	11.7	[5.4, 23.3]
1	111/740	14.9	[9.5, 22.8]	73/740	10.7	[6.2, 17.7]
2	127/740	16	[8.9, 27.1]	121/740	15.6	[9.6, 24.5]
3	122/740	18.5	[11.9, 27.7]	128/740	16.8	[12.6, 22.1]
4	282/740	37.7	[24.4, 53.1]	329/740	45.2	[33.3, 57.7]
Received no SMC*	89/740	11.7	[5.4, 23.3]	-	-	-
Received at least one cycle	642 /740	87.2	[74.9, 94.0]	642/740	87.2	[74.9, 94.0]
Received at least 3 cycles	404 /740	56.2	[41.5, 69.9]	457/740	62.0	[48.5, 73.9]
Received all 4 cycles	282 /740	37.7	[24.4, 53.1]	329/740	45.2	[33.3, 57.7]

Percentages are survey -weighted and will not equate to n/N. [§] aged at least 3 months at time of first cycle, and under 5 years at time of survey. * this is confirmed as no receipt, rather than failure to indicate receipt.

Chimioprévention du paludisme saisonnier au Niger – Access SMC

Rapport abrégé et préliminaire de couverture programmatique, 2015

Contexte: La chimioprévention du paludisme saisonnier (CPS, ou en anglais SMC) a été introduite au Niger en 2013 et s'est progressivement élargie durant les années suivantes. En 2015, presque 800 000 enfants âgés de 3 à 59 mois constituaient la population cible pour la CPS dans 12 districts. Une grande partie de cette population cible réside dans les 8 districts ciblés par le projet Access-SMC avec le support financier d'UNITAID. La première distribution en 2015 a eu lieu en août, et les distributions mensuelles se sont poursuivies jusqu'au mois de novembre. Il est important que les programmes de la CPS soient évalués afin de s'assurer que l'intervention est correctement mise en œuvre et qu'elle atteint bien les enfants cibles. L'OMS recommande que les enfants reçoivent les 4 distributions mensuelles de la CPS afin de leur préférer une protection maximale et de minimiser l'émergence de parasites résistants aux antipaludéens. Dans le cadre d'un programme de monitoring du programme CPS au Niger, des enquêtes de couverture ont été réalisées en janvier et février 2016 dans 4 des 8 districts couverts par le programme ACCESS-SMC. Ces enquêtes ont été mises en œuvre par Epicentre en collaboration avec le PNLN avec le soutien de la London School of Hygiene and Tropical Medicine. Les enquêtes avaient pour principaux objectifs d'estimer la proportion d'enfants recevant chaque distribution mensuelle, l'observance au traitement pendant les 3 jours, et de décrire les raisons de non-participation à la CPS.

Messages clefs:

La couverture des programmes CPS est très hétérogène, et nettement inférieure aux autres districts dans les districts sanitaires urbains de Maradi et de Zinder.

L'utilisation rapportée des moustiquaires varie entre 80% à Zinder et 99% à Aguié.

La conservation des cartes CPS est relativement faible dans 3 des 4 districts enquêtés.

A Aguié, 45% des enfants éligibles ont reçu 4 distributions et 71% au moins 3 distributions. A Madaoua 43% ont reçu 4 distributions et 64% au moins 3 distributions. A Maradi, uniquement 10% des enfants cibles ont reçu au moins 3 doses, et 25% des enfants n'ont reçu aucune distribution. A Zinder, uniquement 13% ont reçu au moins 3 doses, et 63% n'ont reçu aucune distribution.

Les tendances de couverture selon les tours de distribution sont ainsi très variables en fonction des districts.

Il est important de s'assurer que les enfants hors de la population cible ne reçoivent pas la CPS, car les posologies utilisées sont destinées aux enfants âgés moins de 5 ans. Dès lors, les enfants âgés de plus de 5 ans qui reçoivent la CPS ne seront pas complètement protégés. Il est donc important de réduire au maximum le nombre d'enfants hors cible qui reçoivent la CPS.

Méthodes: Dans les Districts Sanitaires urbains de Maradi et Zinder, un échantillonnage en grappe a été effectué. À l'aide d'images satellites, 30 coordonnées géographiques ont été sélectionnées aléatoirement dans chaque ville. Ensuite, tous les enfants résidant dans les 24 ménages les plus proches de ces points ont été invités de participer à l'enquête. Dans les Districts Sanitaires ruraux de Madaoua et Aguié, 30 villages ont été sélectionnés aléatoirement à partir d'une liste exhaustive des villages du district, avec une probabilité de sélection proportionnelle à la taille de la population du village. Dans chaque village à enquêter, la méthode du PEV pour les enquêtes de couverture vaccinale a été utilisée pour identifier le premier ménage à enquêter. Une grappe était constituée des 24 ménages les plus proches à partir du premier ménage identifié dans le village. Les enfants éligibles pour la CPS (âgés de 3 à 59 mois au moment de la première distribution) étaient éligibles pour inclusion dans l'enquête, ainsi que les enfants jusqu'à 7 ans afin d'estimer le pourcentage de ces enfants qui ont reçu la CPS. Des enquêteurs ont mené des entretiens avec le chef de ménage ou son représentant (responsable de l'enfant). Les répondants ont été interrogés sur le nombre de distributions de CPS reçu par chaque enfant et les informations collectées ont été comparées avec les informations présentes sur les cartes du programme CPS.

Quelques détails sur les indicateurs clefs: Les détails pour chaque district enquêté sont présentés dans les tableaux 2-5. À Aguié, la couverture estimée du programme CPS était médiocre pour la première distribution (56%), avec une amélioration pour les 2^{ème}-4^{ème} distributions (70-83%). À Madaoua, la couverture par tour allait de 66 % à 77% pendant les 4 distributions. À Maradi, la couverture était très faible (<25%) pendant les 3 premières distributions, mais était à 57% pour la 4^{ème}. La couverture à Zinder était faible (29%) pour la première distribution et diminuait à chaque distribution successive, arrivant à 10% lors de la 4^{ème} distribution.

La prévalence d'effets indésirables rapportés par les responsables des enfants varie beaucoup selon le district : à Aguié, Madaoua et Maradi, elle était comprise entre 1,2-3,1% des enfants ayant reçu au moins une distribution. En revanche, à Zinder, la prévalence a été estimée à 20%. L'observance rapportée au traitement de 3 jours était excellente dans les 4 districts.

Parmi les enfants âgés de 6 et 7 ans, la proportion ayant reçu au moins une distribution varie entre 18% et 41% selon le district. La proportion des enfants âgés de 6 et 7 ans ayant reçu au moins 3 distributions est plus élevée dans les deux districts ruraux, ce qui est probablement lié à une couverture globale plus élevée dans ces deux districts. Ces résultats pourraient expliquer en partie les discordances entre les couvertures administratives et les résultats de ces enquêtes.

Le délai de 3 mois entre la dernière distribution et la cloture de la dernière enquête pourrait en partie expliquer le faible taux de conservation de cartes dans quelques districts, et aurait pu introduire un biais de rappel pour certaines estimations. Néanmoins, les tendances restent claires.

Rapport préparé par Matthew Coldiron (mcoldiron@epicentre.msf.org) et Halidou Salou (hsalou@epicentre.msf.org) 18 mai 2016.

Tableau 1 : Principaux indicateurs par district, enquêtes de couverture CPS, Niger, 2015

	Aguié	Madaoua	Maradi	Zinder
Nombre d'enfants enquêtés éligibles pour 4 distributions	1057	1076	1083	911
A dormi sous une moustiquaire la veille de l'enquête	99%	89%	85%	80%
A reçu une carte CPS	87%	86%	64%	35%
Carte conservé (parmi ceux en ayant reçu une)	88%	67%	55%	21%
<i>Confirmé par carte si disponible, sinon selon les dires du responsable de l'enfant:</i>				
A reçu au moins 1 distribution CPS	90%	92%	75%	37%
A reçu au moins 3 distributions CPS	71%	64%	10%	13%
A reçu les 4 distributions CPS	45%	43%	4%	7%
N'a reçu aucune distribution CPS	10%	7%	25%	63%
Pour ceux qui ont reçu la dernière distribution, observance correcte à la prise des 3 doses d'amodiaquine	100%	100%	99%	97%
Enfants âgés 6-7 ans ayant reçu au moins 1 distribution CPS	27%	40%	41%	18%
Enfants âgés 6-7 ans ayant reçu au moins 3 distributions CPS	20%	31%	3%	7%

Tableau 2: Indicateurs clefs de l'enquête de couverture – Aguié*

Enfants 3 mois – 7 ans inclus	1309			
Nombre éligible pour 4 distributions [§]	1057			
		%	IC 95%	
A dormi sous une moustiquaire la veille	98.9		[93.3, 99.8]	
A reçu carte CPS	86.9		[77.4, 92.8]	
A conservé carte (si reçu)	87.8		[81.4, 92.2]	
		<i>Confirmé par carte, ou par histoire si carte non disponible[^]</i>		
		%	IC 95%	
Distributions reçues				
août	55.6		[43.1, 67.2]	
septembre	83.1		[73.5, 89.7]	
octobre	81.2		[72.3, 87.8]	
novembre	70.2		[62.6, 76.8]	
		<i>Confirmé par carte, ou histoire si carte non disponible[^]</i>		
		%	IC 95%	<i>Maximum par carte ou par histoire[‡]</i>
				%
				IC 95%
Nombre total de distributions reçues				
0	10.2		[5.0, 19.8]	9.5 [4.5, 19.0]
1	5.0		[3.0, 8.3]	2.5 [1.1, 5.5]
2	14.2		[9.7, 20.3]	5.6 [3.3, 9.5]
3	25.9		[19.3, 33.9]	14.6 [10.2, 20.5]
4	44.7		[33.4, 56.5]	67.8 [56.8, 77.2]
Au moins 1 distribution	89.8		[80.2, 95.0]	89.8 [80.2, 95.0]
Au moins 3 distributions	70.6		[61.3, 78.5]	82.4 [72.4, 89.3]

* Les pourcentages présentés sont pondérés et ajustés pour l'échantillonnage en grappe donc ne s'ajoutent pas à n/N [§] âgé d'au moins 3 mois au moment de la première distribution et moins de 5 ans au moment de l'enquête [^] priorité donné aux informations disponibles sur les cartes CPS ; les dires des parents sur la réception de différentes distributions sont prises en compte uniquement en l'absence de carte [‡] Dans ce cas, les enfants qui détiennent une carte CPS sans preuve de réception d'une distribution mais pour qui le responsable déclare que l'enfant a reçu la distribution, on considère que la distribution a été reçue.

Tableau 3: Indicateurs clefs de l'enquête de couverture – Madaoua *

Enfants 3 mois – 7 ans inclus	1371			
Nombre éligible pour 4 distributions [§]	1076			
	%	IC 95%		
A dormi sous une moustiquaire la veille	88.9	[80.5, 93.9]		
A reçu carte CPS	86.1	[76.6, 92.2]		
A conservé carte (si reçu)	67.4	[57.8, 75.7]		
	<i>Confirmé par carte, ou par histoire si carte non disponible[^]</i>			
	%	IC 95%		
Distributions reçues				
août	65.7	[54.2, 75.6]		
septembre	77.4	[68.7, 84.1]		
octobre	70.1	[60.2, 78.4]		
novembre	66.7	[56.4, 75.5]		
	<i>Confirmé par carte, ou par histoire si carte non disponible[^]</i>			
	%	IC 95%	<i>Maximum par carte ou par histoire[‡]</i>	%
				IC 95%
Nombre total de distributions reçues				
0	8.1	[4.4, 14.3]	6.7	[3.5, 12.5]
1	11.1	[6.8, 17.4]	3.8	[2.3, 6.4]
2	16.2	[11.9, 21.8]	9.8	[6.5, 14.7]
3	21.6	[16.0, 28.6]	20.8	[15.3, 27.7]
4	43.0	[31.9, 54.7]	58.8	[47.0, 69.6]
Au moins 1 distribution	91.9	[85.7, 95.6]	91.9	[85.7, 95.6]
Au moins 3 distributions	64.6	[54.4, 73.6]	79.6	[71.4, 85.9]

* Les pourcentages présentés sont pondérés et ajustés pour l'échantillonnage en grappe donc ne s'ajoutent pas à n/N [§] âgé d'au moins 3 mois au moment de la première distribution et moins de 5 ans au moment de l'enquête [^] priorité donné aux informations disponibles sur les cartes CPS ; les dires des parents sur la réception de différentes distributions sont prises en compte uniquement en l'absence de carte [‡] Dans ce cas, les enfants qui détiennent une carte CPS sans preuve de réception d'une distribution mais pour qui le responsable déclare que l'enfant a reçu la distribution, on considère que la distribution a été reçue.

Tableau 4: Indicateurs clefs de l'enquête de couverture – Maradi*

Enfants 3 mois – 7 ans inclus	1413			
Nombre éligible pour 4 distributions [§]	1083			
	%	IC 95%		
A dormi sous une moustiquaire la veille	84.7	[9.6, 23.0]		
A reçu carte CPS	63.9	[53.7, 72.9]		
A conservé carte (si reçu)	55.1	[43.9, 65.9]		
	<i>Confirmé par carte, ou par histoire si carte non disponible[^]</i>			
	%	IC 95%		
Distributions reçues				
août	15.3	[8.7, 25.4]		
septembre	17.6	[11.2, 26.5]		
octobre	22.7	[15.6, 31.9]		
novembre	57.9	[46.4, 68.6]		
	<i>Confirmé par carte, ou par histoire si carte non disponible[^]</i>			
	%	IC 95%	<i>Maximum par carte ou par histoire[‡]</i>	
	%	IC 95%	%	IC 95%
Nombre total de distributions reçues				
0	24.9	[15.6, 37.4]	24.9	[15.6, 37.4]
1	49.8	[39.8, 59.9]	49.2	[39.2, 59.3]
2	15.7	[10.6, 22.7]	16.0	[10.8, 23.0]
3	5.4	[3.0, 9.7]	5.6	[3.0, 10.3]
4	4.1	[1.9, 8.6]	4.2	[2.0, 8.8]
Au moins 1 distribution	75.1	[62.6, 84.4]	75.1	[62.6, 84.4]
Au moins 3 distributions	9.5	[5.1, 17.2]	9.9	[5.2, 17.9]

* Les pourcentages présentés sont pondérés et ajustés pour l'échantillonnage en grappe donc ne s'ajoutent pas à n/N [§] âgé d'au moins 3 mois au moment de la première distribution et moins de 5 ans au moment de l'enquête [^] priorité donné aux informations disponibles sur les cartes CPS ; les dires des parents sur la réception de différentes distributions sont prises en compte uniquement en l'absence de carte [‡] Dans ce cas, les enfants qui détiennent une carte CPS sans preuve de réception d'une distribution mais pour qui le responsable déclare que l'enfant a reçu la distribution, on considère que la distribution a été reçue.

Tableau 5: Indicateurs clefs de l'enquête de couverture – Zinder*

Enfants 3 mois – 7 ans inclus	1387			
Nombre éligible pour 4 distributions [§]	911			
	%	IC 95%		
A dormi sous une moustiquaire la veille	80.1	[73.6, 85.3]		
A reçu carte CPS	34.6	[28.0, 41.9]		
A conservé carte (si reçu)	21.3	[14.5, 30.1]		
	<i>Confirmé par carte, ou par histoire si carte non disponible[^]</i>			
	%	IC 95%		
Distributions reçues				
août	29.1	[23.9, 34.8]		
septembre	24.4	[19.0, 30.7]		
octobre	16.8	[12.1, 22.9]		
novembre	10.0	[6.4, 15.3]		
	<i>Confirmé par carte, ou par histoire si carte non disponible[^]</i>			
	%	IC 95%	<i>Maximum par histoire ou par rappel[‡]</i>	
			%	IC 95%
Nombre total de distributions reçues				
0	63.2	[56.2, 69.6]	62.7	[55.9, 69.1]
1	13.9	[11.2, 17.1]	14	[11.2, 17.3]
2	10.0	[7.7, 12.9]	10.1	[7.8, 13.1]
3	5.6	[3.5, 9.0]	5.6	[3.5, 9.0]
4	7.3	[4.2, 12.5]	7.5	[4.3, 12.8]
Au moins 1 distribution	36.8	[30.4, 43.8]	36.8	[30.4, 43.8]
Au moins 3 distributions	13.0	[8.8, 18.6]	13.2	[8.9, 19.1]

* Les pourcentages présentés sont pondérés et ajustés pour l'échantillonnage en grappe donc ne s'ajoutent pas à n/N [§] âgé d'au moins 3 mois au moment de la première distribution et moins de 5 ans au moment de l'enquête [^] priorité donné aux informations disponibles sur les cartes CPS ; les dires des parents sur la réception de différentes distributions sont prises en compte uniquement en l'absence de carte [‡] Dans ce cas, les enfants qui détiennent une carte CPS sans preuve de réception d'une distribution mais pour qui le responsable déclare que l'enfant a reçu la distribution, on considère que la distribution a été reçue.



Seasonal Malaria Chemoprevention in Nigeria

Coverage Summary Report 2015

Background: Seasonal Malaria Chemoprevention supported by the ACCESS-SMC project was introduced in 17 LGAs in Nigeria in 2015 (10 in Sokoto State and 7 in Zamfara state). In 2015, the first of four monthly cycles of SMC was carried out in early August, and the final cycle took place in late October/ early November. It is important the SMC programme is monitored to ensure the intervention is delivered effectively reaching the children that need it. WHO recommends that children should receive all four monthly cycles, and should adhere to the treatment dose each month, in order to maximise protection and minimise selection for drug resistance. As part of the monitoring of the SMC programme in Nigeria, a coverage survey was carried out in mid-November 2015 by ERIC with support from the London School of Hygiene & Tropical Medicine, to determine the proportion of children that received each monthly treatment, and to ask about adherence to the treatment doses, and reasons for missed treatments.

Key messages:

The reach of the SMC programme in Nigeria has been good, with 84 % of children having received an SMC card and at least one cycle of SMC. This compares with 83 % of eligible children who slept under an insecticide treated net the night before the survey at the end of the rainy season.

Retention of the SMC card was almost 75% among those issued with a card, which does facilitate evaluation of the programme, but leaves some uncertainty for those who without a card at the time of the survey or those children whose card may not have been complete.

Around 61% of eligible children received at least 3 cycles of SMC, 42% received all 4 cycles.

Coverage of the first cycle appears to be highest, with coverage at the final cycle in November having the lowest coverage.

It is important to ensure that children too old for the SMC programme do not receive SMC, the dose is designed for children under 5 years of age, older children receiving this dose will not be fully protected. Some treatment outside the recommended age range is inevitable, but it is important this is kept to a minimum.

Key indicators 2015:

Number surveyed who were eligible for all 4 SMC cycles	1112
Slept under a bednet last night	83.3%
Received an SMC card	83.9%
<i>Confirmed by card if available, otherwise from caregiver recall:</i>	
Received at least one cycle	77.3%
Received at least 3 cycles	61.4%
Received all 4 cycles	42.4%
Received no SMC	18.0%
For those that had SMC at the last cycle, adherence to all 3 doses	84.2%
Children 6-7yrs old who received SMC at least once	61.3%

Methods: Within each LGA implementing SMC in 2015 supported by the ACCESS-SMC project, between 3 and 5 settlements were selected with probability proportional to size (PPS sampling). Within each settlement, a random sample of approximately 20 children was then taken. The survey included eligible children (SMC is given to children aged at least 3 months, and who were less than 5 years old at the first cycle). The survey also included older children up to 7 years of age in order to determine how many of these older children were being treated. Call-backs were done if the caregiver was absent. The caregiver was asked about the number of SMC treatments the child received and in which months SMC was given, and the SMC record card was inspected to record the dates of treatments on the card. Data were collected using tablet PCs.

More details on Key indicators: 1380 children were included in the survey, 1112 of these were eligible to receive all 4 cycles of SMC in 2015 based on their age at the time of the first SMC cycle. Around 84% of eligible children received an SMC card. If an SMC card was received, approximately 75% of children retained the card for inspection. Based on the card (where available, and on recall of the number of blister packs received otherwise), 70% of eligible children received at least 3 cycles of SMC, and 48% received all 4 cycles. Recall was an important source of information in Nigeria, because the SMC card was often incomplete. Coverage of the individual cycles is difficult to estimate because this relies on documentation of dates on the card, which was not always done, so may lead to an underestimate. However, even allowing for these issues, it appears that coverage of the third and fourth cycles of SMC, was lower than the first 2 cycles, with coverage of the final cycle particularly low.

Reported adherence to the three day course of SMC was good, with 84% of those who had received SMC reporting that the full course was given.

Of 75 children aged between 6 and 7 years who should not receive SMC, 40 (53%) had received an SMC card. For 46 (61%) of these older children, caregivers reported that the child had received at least one SMC cycle, with about 49% reporting that the child had received at least 3 cycles.

Report compiled by M Cairns, P Milligan, Musa Kana May 18 2016. Contact Dr. Musa Kana musakana77@yahoo.com for further information.

Table: Key indicators of SMC Coverage – Nigeria

Number children 3m–7 years included	1380					
Number eligible for all 4 SMC cycles [§]	1112					
	n/N	%	95% Confidence Interval			
Slept under a bednet last night	830/1104	83.3	[78.7, 87.1]			
Received SMC card	841/1082	83.9	[78.8, 88.0]			
Retained card if card received	607/839	74.5	[65.9, 81.6]			
	Among all those eligible for SMC			Among only those with an SMC card		
Received SMC cycle 1	392/1112	42.2	[33.2, 51.8]	392/841	51.3	[40.8, 61.8]
Received SMC cycle 2	423/1112	43.2	[34.2, 52.7]	423/841	52.6	[42.2, 62.7]
Received SMC cycle 3	308/1112	34.2	[25.7, 44.0]	308/841	41.7	[31.7, 52.3]
Received SMC cycle 4	209/1112	27.0	[18.9, 37.0]	209/841	32.9	[23.4, 44.0]
	Confirmed by card if available, otherwise recall [^]			Maximum by card / recall		
No. of SMC cycles	n/N	%	95% Confidence Interval	n/N	%	95% Confidence Interval
0	111/1112	12.3	[6.7, 21.6]	37/1112	3.6	[1.7, 7.7]
1	71/1112	7.3	[4.3, 12.2]	41/1112	3.6	[2.1, 6.3]
2	118/1112	10.7	[5.7, 19.3]	66/1112	5.3	[2.9, 9.5]
3	299/1112	21.5	[16.2, 28.0]	401/1112	33.0	[26.2, 40.5]
4	323/1112	48.1	[38.3, 58.1]	364/1112	54.5	[44.6, 64.0]
Received no SMC*	254/1112	18.0	[12.7, 25.1]	-	-	-
Received at least one cycle	811/1112	77.3	[69.2, 83.8]	811/1112	77.3	[69.2, 83.8]
Received at least 3 cycles	622 /1112	61.4	[52.2, 69.8]	778/1112	77.2	[70.9, 82.5]
Received all 4 cycles	323/1112	42.4	[33.8, 51.7]	364/1112	54	[44.3, 63.5]

Percentages are survey -weighted and will not equate to n/N. [§] aged at least 3 months at time of first cycle, and under 5 years at time of survey. * this is confirmed as no receipt, rather than failure to indicate receipt.



Seasonal Malaria Chemoprevention in Burkina Faso

Coverage Summary Report 2016

Key messages:

The reach of the SMC programme has been excellent, with 98% of children having received at least one cycle of SMC.

71% of those issued with a card had a card available for inspection.

91% of eligible children received at least 3 cycles of SMC, and 83% received all 4 cycles.

Coverage was slightly lower at cycle 4 than the other cycles.

It is important to ensure that children too old for the SMC programme do not receive SMC, the dose is designed for children under 5 years of age, older children receiving this dose will not be fully protected. Some treatment outside the recommended age range is inevitable, but it is important this is kept to a minimum. In Burkina Faso many older children are being treated, 81% of 6-7 year olds had received SMC.

Reported adherence to the three day course of SMC was excellent.

97% of children slept under an insecticide treated net the night before the survey.

Report prepared for the PNLP by LSHTM with data supplied by IRSS

For Malaria Consortium: d.moroso@malariaconsortium.org; j.tibenderana@malariaconsortium.org

Key indicators 2016:

Number surveyed who were eligible for all 4 SMC cycles	874
Slept under a bednet last night	97%
Received an SMC card	94%
<i>Confirmed by card if available, otherwise from caregiver recall:</i>	
Received at least one cycle	98%
Received at least 3 cycles	91%
Received all 4 cycles	83%
Received no SMC	2%
For those that had SMC at the last cycle, adherence to all 3 doses	97%

Children 6-7yrs old who received SMC at least once	81%
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Table: Key indicators of SMC Coverage – Burkina 2016

Number children 3mons–7yrs included	1136			
Number eligible for all 4 SMC cycles \$	874			
	n/N	%		
Slept under a bednet last night	843/871	96.8		
Received SMC card	822/874	94.1		
Retained card if card received	587/822	71.4		
Received SMC cycle 1	824/874	94.3		
Received SMC cycle 2	813/874	93.0		
Received SMC cycle 3	795/874	91.0		
Received SMC cycle 4	733/874	83.9		
	Confirmed by card if available, otherwise recall^		Maximum by card or recall	
No. of SMC cycles	n/N	%	n/N	%
0	21/874	2.4	6/874	0.7
1	35/874	4.0	6/874	0.7
2	26/874	3.0	20/874	2.3
3	63/874	7.2	45/874	5.1
4	729/874	83.4	797/874	91.2
Received no SMC*	6/874	0.7	6/874	0.7
Received at least one cycle	853/874	97.6	868/874	99.3
Received at least 3 cycles	792/874	90.6	842/874	96.3
Received all 4 cycles	729/874	83.4	797/874	91.2

Report prepared for the PNLP by LSHTM with data supplied by IRSS

For Malaria Consortium: d.moroso@malariaconsortium.org; j.tibenderana@malariaconsortium.org



Seasonal Malaria Chemoprevention in Chad

Coverage Summary Report 2016

Background: Seasonal Malaria Chemoprevention supported by the ACCESS-SMC project was introduced in 14 health districts in Chad in 2016. In 2016, the first of four monthly cycles of SMC was carried out in late August /early September, and the final cycle took place in late November / early December. However, due to drug supply issues the start of cycle 1 was delayed in some areas and not all districts received 4 cycles of SMC. Mani, Massaguet and Massakory, in Chad only received 3 cycles whilst 4 cycles were administered in Bai-illi, Bongor, Bousso, Dourbali, Kouno, Mandelia, Massenya, N'Djamena Centre, N'Djamena Est, N'Djamena Nord and N'Djamena Sud. The key indicators are for those districts that had at least all 4 cycles of SMC. Results for areas that delivered 3 cycles are listed at the end of the document.

It is important the SMC programme is monitored to ensure the intervention is delivered effectively reaching the children that need it. WHO recommends that children should receive all four monthly cycles, and should adhere to the treatment dose each month, in order to maximise protection and minimise selection for drug resistance. As part of the monitoring of the SMC programme in Chad, a coverage survey was carried out in late December/early January by CSSI with support from the London School of Hygiene & Tropical Medicine and Malaria Consortium, to determine the proportion of children that received each monthly treatment, and to ask about adherence to the treatment doses, and reasons for missed treatments.

Key messages:

The reach of the SMC programme in Chad has been good, with 73% of children having received an SMC card and 89% at least one cycle of SMC.

Retention of the SMC card was poor, only 60% of those issued with a card had a card available for inspection.

39% of eligible children received at least 3 cycles of SMC, and only 15% received all 4 cycles.

Coverage was highest at cycle 1 and progressively lower in each subsequent cycle.

It is important to ensure that children too old for the SMC programme do not receive SMC, the dose is designed for children under 5 years of age, older children receiving this dose will not be fully protected. Some treatment outside the recommended age range is inevitable, but it is important this is kept to a minimum. Chad has a high proportion (57%) of children greater than 5 years old given SMC.

Reported adherence to the three day course of SMC was excellent, with 93% of those who had received SMC reporting that the full course was given.

97% of children slept under an insecticide treated net the night before the survey.

Key indicators 2016 for districts that received all 4 cycles:

Number surveyed who were eligible for all 4 SMC cycles **797**

Slept under a bednet last night **97%**

Received an SMC card **73%**

Confirmed by card if available, otherwise from caregiver recall:

Received at least one cycle **90%**

Received at least 3 cycles **39%**

Received all 4 cycles **15%**

Received no SMC **11%**

For those that had SMC at the last cycle, adherence to all 3 doses **97%**

Children 6-7yrs old who received SMC at least once **57%**

Report compiled for the PNLP by LSHTM with data supplied by CSSI

Report prepared for the PNLP by LSHTM with data supplied by CSSI

For Malaria Consortium: d.moroso@malariaconsortium.org; j.tibenderana@malariaconsortium.org

Table 1: Key indicators of SMC Coverage amongst districts that received all four cycles of SMC – Chad						
Number children 3mons–7yrs included	1111					
Number eligible for all 4 SMC cycles [§]	797					
	n/N	%	95% Confidence Interval			
Slept under a bednet last night	766/795	97.1	(94.1-98.6)			
Received SMC card	559/797	73.2	(63.5-81.0)			
Retained card if card received	344/797	59.7	(50.0-68.7)			
Received SMC cycle 1	538/797	70.3	(59.4-79.3)			
Received SMC cycle 2	398/797	51.0	(42.2-59.7)			
Received SMC cycle 3	187/797	25.6	(19.6-32.8)			
Received SMC cycle 4	126/797	18.1	(11.8-26.8)			
	Confirmed by card if available, otherwise recall[^]			Maximum by card or recall		
No. of SMC cycles	n/N	%	95% Confidence Interval	n/N	%	95% Confidence Interval
0	120/797	14.5	(8.9-22.6)	94/797	10.5	(5.6-18.8)
1	179/797	23.6	(16.3-32.9)	175/797	22.7	(15.3-32.3)
2	249/797	27.7	(21.3-35.1)	254/797	28.2	(21.9-35.5)
3	153/797	22.0	(14.1-32.7)	161/797	23.3	(15.2-34.1)
4	96/797	12.2	(8.1-18.1)	113/797	15.2	(9.9-22.8)
Received no SMC*	94/797	10.5	(5.6-18.8)	94/797	10.5	(5.6-18.8)
Received at least one cycle	677/797	85.5	(77.4-91.1)	703/797	89.5	(81.2-94.4)
Received at least 3 cycles	249/797	34.2	(24.8-45.1)	274/797	38.5	(28.1-50.2)
Received all 4 cycles	96/797	12.2	(8.1-18.1)	113/797	15.2	(9.9-22.8)

Percentages are survey -weighted and will not equate to n/N. [§] aged at least 3 months at time of first cycle, and under 5 years at time of survey. * this is confirmed as no receipt, rather than failure to indicate receipt.

Report prepared for the PNLP by LSHTM with data supplied by CSSI

Table 2: Key indicators of SMC Coverage amongst districts that received only three cycles of SMC – Chad

Number children 3mons–7yrs included	217					
Number eligible for all 4 SMC cycles [§]	149					
	n/N	%	95% Confidence Interval			
Slept under a bednet last night	140/149	94.4	(87.1-97.7)			
Received SMC card	99/149	67.9	(47.5-83.2)			
Retained card if card received	84/149	85.4	(68.8-93.9)			
Received SMC cycle 1	129/149	87.4	(80.7-92.0)			
Received SMC cycle 2	99/149	64.8	(46.6-79.5)			
Received SMC cycle 3	25/149	15.8	(8.2-28.4)			
Received SMC cycle 4	2/149	1.1	(0.1- 7.5)			
	Confirmed by card if available, otherwise recall[^]			Maximum by card or recall		
No. of SMC cycles	n/N	%	95% Confidence Interval	n/N	%	95% Confidence Interval
0	4/149	2.8	(1.0- 7.6)	3/149	2.1	(0.6- 7.4)
1	41/149	28.8	(14.7-48.7)	40/149	28.3	(14.1-48.6)
2	33/149	22.2	(12.4-36.4)	33/149	22.2	(12.4-36.4)
3	65/149	42.9	(29.1-58.0)	67/149	44.2	(30.3-59.2)
4	6/149	3.3	(0.4-20.7)	6/149	3.3	(0.4-20.7)
Received no SMC*	3/149	2.1	(0.6- 7.4)	3/149	2.1	(0.6- 7.4)
Received at least one cycle	145/149	97.2	(92.4-99.0)	146/149	97.9	(92.6-99.4)
Received at least 3 cycles	71/149	46.2	(31.9-61.1)	73/149	47.5	(32.7-62.8)
Received all 4 cycles	6/149	3.3	(0.4-20.7)	6/149	3.3	(0.4-20.7)

Report prepared for the PNLP by LSHTM with data supplied by CSSI

Seasonal Malaria Chemoprevention in The Gambia

Coverage Summary Report 2016

Background: Seasonal Malaria Chemoprevention was introduced in The Gambia in 2014 and delivered with support by the ACCESS-SMC project in 2015 and 2016 in Upper River and Central River Regions. In 2016 the first of four monthly cycles of SMC was implemented in late August /early September, and the final cycle in late November / early December. It is important SMC programmes are monitored to ensure the intervention is delivered effectively reaching the children that need it.

WHO recommends that children should receive all four monthly cycles, and should adhere to the treatment dose each month, in order to maximise protection and minimise selection for drug resistance. As part of the monitoring of the SMC programme in The Gambia, a coverage survey was carried out in late December/early January by MRC with support from the London School of Hygiene & Tropical Medicine, to determine the proportion of children that received each monthly treatment, and to ask about adherence to the treatment doses, and reasons for missed treatments.

Key messages:

The reach of the SMC programme in The Gambia has been excellent, 81% of eligible children received SMC treatment at least once in 2016. 64% of eligible children received at least three monthly treatments.

43% of children received treatment at all 4 SMC cycles.

61% of eligible children slept under an insecticide treated net the night before the survey.

Of those children who received an SMC card, 66% had a card at the time of the survey, for inspection by the survey team.

Children who are more than 5 years old at the time of the first cycle should not receive SMC, in The Gambia this was respected, only 15% of children aged 6-7 years at the time of the survey, had received SMC.

Training of health workers involved in SMC delivery should emphasise the importance of recording the date of each treatment on the child's SMC card, to allow more accurate assessment of coverage.

Key indicators 2016:

Number surveyed who were eligible for all 4 SMC cycles	1138
Slept under a bednet last night	61%
Received an SMC card	75%
<i>Confirmed by card if available, otherwise from caregiver recall:</i>	
Received at least one cycle	81%
Received at least 3 cycles	64%
Received all 4 cycles	43%
Received no SMC	20%
For those that had SMC at the last cycle, adherence to all 3 doses	99%
Children 6-7yrs old who received SMC at least once	15%

Report prepared for the NMCP by LSHTM using data supplied by MRC

More details on Key indicators: 1706 children were included in the survey, 1138 of these were eligible to receive all 4 cycles of SMC in 2016 based on their age at the time of the first SMC cycle. Around 75% of eligible children received an SMC card and received at least one cycle of SMC. If an SMC card was received, approximately 66% of children retained the card for inspection. Based on the card (where available, and on recall of the monthly cycles, or the number of blister packs received otherwise), 64% of eligible children received at least 3 cycles of SMC, and 43% received all 4 cycles. Coverage of the individual cycles is more difficult to estimate because documentation of dates on the card is known to be incomplete, and caregivers may not be able to accurately recall if their child was treated in specific months (but may recall more confidently the number of times they were treated). Coverage appeared to be slightly lower at cycle 4 (coverage was 53%, 53%, 49% and 39% for cycles 1, 2, 3 and 4 respectively).

Reported adherence to the three day course of SMC was excellent, with 99% of those who had received SMC reporting that the full course was given.

Of 450 children aged between 6 and 7 years who should not receive SMC, 56 (18%) had received an SMC card, and 45 (14.8%) of caregivers reported that the child had received at least one SMC cycle, with about 11% reporting that the child had received at least 3 cycles.

Report compiled for the NMCP by LSHTM with data supplied by MRC.

Table: Key indicators of SMC Coverage – The Gambia 2016

Number children 3mons–7yrs included	1706					
Number eligible for all 4 SMC cycles [§]	1138					
	n/N	%	95% Confidence Interval			
Slept under a bednet last night	668/1136	61.3	(51.4-70.3)			
Received SMC card	839/1138	75.1	(68.4-80.7)			
Retained card if card received	540/839	66.1	(57.3-74.0)			
Received SMC cycle 1	581/1138	52.6	(44.7-60.3)			
Received SMC cycle 2	601/1138	52.7	(46.1-59.3)			
Received SMC cycle 3	562/1138	49.0	(42.2-55.8)			
Received SMC cycle 4	440/1138	39.4	(31.8-47.5)			
	Confirmed by card if available, otherwise recall[^]			Maximum by card or recall		
No. of SMC cycles	n/N	%	95% Confidence Interval	n/N	%	95% Confidence Interval
0	309/1138	26.2	(19.6-34.0)	226/1138	19.4	(13.7-26.9)
1	156/1138	13.9	(10.0-19.2)	73/1138	6.1	(3.6-10.3)
2	162/1138	14.0	(11.1-17.4)	124/1138	10.4	(7.8-13.7)
3	202/1138	18.7	(13.8-24.9)	229/1138	20.8	(16.1-26.4)
4	309/1138	27.2	(21.5-33.8)	486/1138	43.3	(35.8-51.1)
Received no SMC*	226/1138	19.4	(13.7-26.9)	226/1138	19.4	(13.7-26.9)
Received at least one cycle	829/1138	73.8	(66.0-80.4)	912/1138	80.6	(73.1-86.3)
Received at least 3 cycles	511/1138	45.9	(38.8-53.2)	715/1138	64.1	(55.7-71.6)
Received all 4 cycles	309/1138	27.2	(21.5-33.8)	486/1138	43.3	(35.8-51.1)

Percentages are survey -weighted and will not equate to n/N. [§] aged at least 3 months at time of first cycle, and under 5 years at time of survey. * this is confirmed as no receipt, rather than failure to indicate receipt.

Report prepared for the NMCP by LSHTM using data supplied by MRC



Seasonal Malaria Chemoprevention in the Republic of Guinea

Coverage Summary Report 2016

Key messages:

The reach of the SMC programme in Guinea has been excellent, with 96% of children having received at least one cycle of SMC.

Only 43% of those issued with a card had a card available for inspection.

83% of eligible children received at least 3 cycles of SMC, and 73% received all 4 cycles.

Coverage was similar in all four cycles with no evidence that coverage decreased from cycle to cycle.

It is important to ensure that children too old for the SMC programme do not receive SMC, the dose is designed for children under 5 years of age, older children receiving this dose will not be fully protected. Some treatment outside the recommended age range is inevitable, but it is important this is kept to a minimum. In Guinea many older children are being treated, 79% of 6-7 year olds had received SMC.

Reported adherence to the three day course of SMC was excellent.

97% of children slept under an insecticide treated net the night before the survey.

Key indicators 2016:

Number surveyed who were eligible for all 4 SMC cycles	1743
Slept under a bednet last night	84%
Received an SMC card	94%
<i>Confirmed by card if available, otherwise from caregiver recall:</i>	
Received at least one cycle	96%
Received at least 3 cycles	83%
Received all 4 cycles	73%
Received no SMC	4%
For those that had SMC at the last cycle, adherence to all 3 doses	98%

Children 6-7yrs old who received SMC at least once	79%
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Table: Key indicators of SMC Coverage – Guinea 2016

Number children 3m–7 years included	2612					
Number eligible for all 4 SMC cycles [§]	1743					
	n/N	%	95% Confidence Interval			
Slept under a bednet last night	1437/1743	83.5	(75.7, 89.1)			
Received SMC card	1634/1743	93.9	(89.1, 96.7)			
Retained card if card received	715/1634	42.6	(37.1, 48.3)			
Received SMC cycle 1	1339/1743	77.0	(72.3, 81.2)			
Received SMC cycle 2	1351/1743	77.8	(73.2, 81.8)			
Received SMC cycle 3	1341/1743	77.3	(70.8, 82.6)			
Received SMC cycle 4	1324/1743	76.0	(68.9, 81.8)			
	Confirmed by card if available, otherwise recall [^]			Maximum by card / recall		
No. of SMC cycles	n/N	%	95% Confidence Interval	n/N	%	95% Confidence Interval
0	69/1743	3.8	(2.7, 5.3)	60/1743	3.3	(2.3, 4.8)
1	125/1743	7.1	(5.3, 9.6)	56/1743	3.2	(2.2, 4.6)
2	215/1743	12.5	(9.9, 15.6)	190/1743	11.0	(8.3, 14.3)
3	176/1743	10.0	(7.5, 13.2)	164/1743	9.5	(7.0, 12.7)
4	1158/1743	66.6	(60.5, 72.2)	1273/1743	73.0	(67.7, 77.8)
Received no SMC*	60/1743	3.3	(2.3, 4.8)			
Received at least one cycle	1674/1743	96.2	(94.7, 97.3)	1674/1743	96.2	(94.7, 97.3)
Received at least 3 cycles	1334/1743	76.6	(72.0, 80.7)	1437/1743	82.5	(78.5, 85.9)
Received all 4 cycles	1158/1743	66.6	(60.5, 72.2)	1273/1743	73.0	(67.7, 77.8)

Report prepared for the PNLP by LSHTM with data supplied by UGANC

Percentages are survey -weighted and will not equate to n/N. [§] aged at least 3 months at time of first cycle, and under 5 years at time of survey. * this is confirmed as no receipt, rather than failure to indicate receipt.

Breakdown of coverage according to source

No. of SMC cycles	Confirmed by card			Recall only		
	n/N	%	95% Confidence Interval	n/N	%	95% Confidence Interval
0	11/715	1.5	(0.8, 2.9)	58/1028	5.3	(3.5, 7.8)
1	101/715	14.5	(10.3, 20.1)	24/1028	2.2	(1.3, 3.9)
2	106/715	15.5	(11.6, 20.6)	109/1028	10.4	(8.0, 13.5)
3	87/715	12.3	(8.7, 17.1)	89/1028	8.5	(5.8, 12.3)
4	410/715	56.1	(47.6, 64.4)	748/1028	73.6	(67.8, 78.7)

Adherence

Full adherence to the two home doses among those who received the last SMC was 98.1% (96.8, 98.8).

Reasons for missed SMC at final cycle

Reason	n	%	CI
0-Not applicable	1559	89.4	(86.3, 91.9)
1-Child was living away from home	13	0.8	(0.3, 2.0)
2-Child was away at the time	62	3.4	(2.3, 5.1)
3-Child was unwell	10	0.6	(0.2, 1.3)
4-Caregiver not available	47	2.7	(1.6, 4.5)
5-Child has history of allergies to drugs	2	0.1	(0.0, 0.5)
8-The health worker did not visit the household	41	2.4	(1.2, 4.9)
9-Family refused: state reason	2	0.1	(0.0, 0.9)
10-Other reason - please specify	7	0.4	(0.2, 1.0)
Total	1743	100	

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For Malaria Consortium: d.moroso@malariaconsortium.org; j.tibenderana@malariaconsortium.org

Coverage among children too old to receive SMC

Number children 6–7 years included	373					
	n/N	%	95% Confidence Interval			
Slept under a bednet last night	287/373	77.8	(68.3, 85.1)			
Received SMC card	274/373	75.5	(65.5, 83.4)			
Retained card if card received	111/274	39.6	(32.4, 47.3)			
Received SMC cycle 1	208/373	57.1	(49.3, 64.6)			
Received SMC cycle 2	201/373	54.9	(47.5, 62.2)			
Received SMC cycle 3	201/373	54.7	(45.9, 63.2)			
Received SMC cycle 4	186/373	50.7	(40.2, 61.1)			
	Confirmed by card if available, otherwise recall [^]			Maximum by card / recall		
No. of SMC cycles	n/N	%	95% Confidence Interval	n/N	%	95% Confidence Interval
0	87/373	21.1	(14.9, 29.1)	87/373	21.1	(14.9, 29.1)
1	27/373	7.5	(5.2, 10.7)	13/373	3.6	(1.7, 7.4)
2	45/373	12.7	(8.8, 17.8)	42/373	11.7	(7.8, 17.4)
3	43/373	11.8	(7.5, 18.2)	44/373	12.2	(7.5, 19.1)
4	171/373	47.0	(38.0, 56.2)	187/373	51.3	(41.5, 61.0)
Received no SMC*	87/373	21.1	(14.9, 29.1)			
Received at least one cycle	286/373	78.9	(70.9, 85.1)	286/373	78.9	(70.9, 85.1)
Received at least 3 cycles	214/373	58.8	(51.5, 65.7)	231/373	63.5	(56.2, 70.3)
Received all 4 cycles	171/373	47.0	(38.0, 56.2)	187/373	51.3	(41.5, 61.0)

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Seasonal Malaria Chemoprevention in Mali

Coverage Summary Report 2016

Key messages:

The reach of the SMC programme in Mali has been excellent, with 90% of children having received at least one cycle of SMC.

Only 33% of those issued with a card had a card available for inspection.

77% of eligible children received at least 3 cycles of SMC, and 57% received all 4 cycles.

Coverage was slightly lower at cycle 4 than the other cycles.

It is important to ensure that children too old for the SMC programme do not receive SMC, the dose is designed for children under 5 years of age, older children receiving this dose will not be fully protected. Some treatment outside the recommended age range is inevitable, but it is important this is kept to a minimum. In Mali in 2016, 53% of 6-7 year olds had received SMC, an increase on 2015.

Reported adherence to the three day course of SMC was excellent.

Report prepared for the PNLP by LSHTM with data supplied by MRTC

For Malaria Consortium: d.moroso@malariaconsortium.org; j.tibenderana@malariaconsortium.org

97% of children slept under an insecticide treated net the night before the survey.

Key indicators 2016:

Number surveyed who were eligible for all 4 SMC cycles	799
Slept under a bednet last night	97%
Received an SMC card	78%
<i>Confirmed by card if available, otherwise from caregiver recall:</i>	
Received at least one cycle	90%
Received at least 3 cycles	77%
Received all 4 cycles	57%
Received no SMC	10%
For those that had SMC at the last cycle, adherence to all 3 doses	97%

Children 6-7yrs old who received SMC at least once	53%
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Report prepared for the PNLP by LSHTM with data supplied by MRTC

For Malaria Consortium: d.moroso@malariaconsortium.org; j.tibenderana@malariaconsortium.org

Table: Key indicators of SMC Coverage – Mali 2016

Number children 3m–7 years included	1023					
Number eligible for all 4 SMC cycles [§]	799					
	n/N	%	95% Confidence Interval			
Slept under a bednet last night	766/799	96.7	(86.5, 99.3)			
Received SMC card	594/799	77.9	(57.6, 90.2)			
Retained card if card received	212/594	33.2	(21.5, 47.4)			
Received SMC cycle 1	546/799	70.5	(53.2, 83.3)			
Received SMC cycle 2	585/799	73.4	(62.2, 82.2)			
Received SMC cycle 3	582/799	71.2	(59.8, 80.4)			
Received SMC cycle 4	520/799	62.5	(49.2, 74.1)			
	Confirmed by card if available, otherwise recall [^]			Maximum by card / recall		
No. of SMC cycles	n/N	%	95% Confidence Interval	n/N	%	95% Confidence Interval
0	66/799	9.9	[4.5, 20.3]	57/799	8.6	[3.6, 18.9]
1	60/799	6.7	[3.5, 12.3]	41/799	5	[2.1, 11.1]
2	123/799	13.2	[7.6, 21.9]	92/799	9.6	[4.7, 18.8]
3	165/799	20.4	[12.7, 31.1]	161/799	19.9	[11.3, 32.6]
4	385/799	49.8	[32.7, 66.9]	448/799	56.9	[37.9, 74.1]
Received no SMC*	57/799	8.6	(3.6, 18.9)			
Received at least one cycle	733/799	90.1	(79.7, 95.5)	733/799	90.1	(79.7, 95.5)
Received at least 3 cycles	550/799	70.2	(54.8, 82.1)	609/799	76.8	(59.8, 88.0)
Received all 4 cycles	385/799	49.8	(32.7, 66.9)	448/799	56.9	(37.9, 74.1)

Percentages are survey -weighted and will not equate to n/N. [§] aged at least 3 months at time of first cycle, and under 5 years at time of survey. * this is confirmed as no receipt, rather than failure to indicate receipt.

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For Malaria Consortium: d.moroso@malariaconsortium.org; j.tibenderana@malariaconsortium.org

Reason for missed SMC at final cycle	n	%	CI
0-Not applicable	675	81.9	(63, 92)
1-Child was living away from home	9	0.7	(0, 6)
2-Child was away at the time	17	2.7	(1, 6)
3-Child was unwell	2	0.8	(0, 5)
4-Caregiver not available	21	6.2	(1, 24)
7-Problems at distribution point	8	1.3	(0, 5)
8-The health worker did not visit the household	10	0.8	(0, 6)
9-Family refused: state reason	1	0.1	(0, 1)
10-Other reason - please specify	56	5.5	(1, 18)
Total	799	100	

Report prepared for the PNLP by LSHTM with data supplied by MRTC

For Malaria Consortium: d.moroso@malariaconsortium.org; j.tibenderana@malariaconsortium.org

Seasonal Malaria Chemoprevention in Niger

Coverage Summary Report 2016

Key messages:

The reach of the SMC programme in Niger has been excellent, the percentage of children having received at least one cycle of SMC ranging from 86% in Zinder to 97% in Aguié.

The percentage of children with an SMC card for inspection was only 23% (Zinder), 37% (Maradi), 44% (Madaoua) and 71% (Aguié).

The percentage of children who received at least three SMC treatments was 57% (Zinder), 75% (Maradi), 71% (Madaoua) and 83% (Aguié). 31%, 52%, 47% and 64% respectively received 4 treatments.

In all areas, coverage was lower in cycles 3 and 4 than in cycles 1 and 2.

It is important to ensure that children too old for the SMC programme do not receive SMC, the dose is designed for children under 5 years of age, older children receiving this dose will not be fully protected. Some treatment outside the recommended age range is inevitable, but it is important this is kept to a minimum. In Aguié many older children are being treated, 80% of 6-7 year olds had received SMC.

Reported adherence to the three day course of SMC was excellent.

91% to 98% of children slept under an insecticide treated net the night before the survey.

Key indicators 2016:

	Aguié	Madaoua	Maradi	Zinder
Number surveyed eligible for all 4 SMC cycles	1376	1382	1444	1287
Slept under a bednet last night	98%	93%	92%	91%
Received an SMC card	96%	87%	83%	80%
Received at least one cycle	97%	88%	92%	86%
Received at least 3 cycles	83%	71%	75%	57%
Received all 4 cycles	64%	47%	52%	31%
Received no SMC	4%	3%	17%	20%
Children 6-7yrs old who received SMC at least once	80%	26%	41%	25%

Table 1. Coverage in children eligible for all 4 SMC cycles

	Aguie		Madaoua		Maradi		Zinder	
	N	%	N	%	N	%	N	%
Used Net Last Night	1350	98.1	1282	92.7	1326	91.8	1177	91.4
SMC Card Received	1319	95.9	1197	86.6	1199	83	1036	80.4
Retained SMC card	938	71.1	528	44.1	445	37.1	242	23.4
Coverage of individual cycles								
Received Cycle 1	1173	85.2	1054	76.2	1106	76.6	956	74.2
Received Cycle 2	1118	81.3	1013	73.2	1111	76.9	837	65
Received Cycle 3	926	67.3	805	58.2	952	65.9	633	49.1
Received Cycle 4	748	54.4	684	49.5	855	59.2	547	42.5
No. cycles received (card confirmed, otherwise recall)								
0	43	3.1	160	11.6	123	8.5	177	13.7
1	97	7	170	12.3	143	9.9	193	15
2	238	17.3	227	16.4	254	17.6	282	21.9
3	320	23.3	308	22.3	306	21.2	288	22.4
4	678	49.3	518	37.5	618	42.8	348	27
Coverage indicators (card confirmed, otherwise recall)								
Received no SMC	34	2.5	152	11	90	6.2	173	13.4
Received at least 1	1333	96.9	1223	88.4	1321	91.5	1111	86.3
Received at least 3	998	72.5	826	59.7	924	64	636	49.4
Received all 4	678	49.3	518	37.5	618	42.8	348	27
No. cycles received (maximum of card or recall)								
0	34	2.5	152	11	90	6.2	173	13.4
1	41	3	68	4.9	70	4.8	129	10
2	156	11.3	178	12.9	206	14.3	270	21
3	262	19	335	24.2	325	22.5	323	25.1
4	883	64.2	650	47	753	52.1	393	30.5
Total	1376	100	1383	100	1444	100	1288	100
Coverage indicators (maximum of card or recall)								
Received at least 1 SMC	1333	96.9	1223	88.4	1321	91.5	1111	86.3
Received at least 3 SMC	1145	83.2	985	71.2	1078	74.7	716	55.6
Received all 4 SMC	883	64.2	650	47	753	52.1	393	30.5

Table 2. Coverage in older children

OLDER CHILDREN	Aguie		Madaoua		Maradi		Zinder	
	N	%	N	%	N	%	N	%
Received an SMC card	62	79.5	49	26.3	71	40.8	23	25.3
No. cycles received (card confirmed, otherwise recall)								
0	13	16.7	139	74.7	87	50	67	73.6
1	10	12.8	5	2.7	11	6.3	6	6.6
2	6	7.7	6	3.2	15	8.6	7	7.7
3	14	17.9	11	5.9	28	16.1	7	7.7
4	35	44.9	25	13.4	33	19	4	4.4
Total	78	100	186	100	174	100	91	100
No. cycles received (maximum of card or recall)								
0	13	16.7	139	74.7	87	50	67	73.6
1	4	5.1	3	1.6	8	4.6	5	5.5
2	5	6.4	3	1.6	13	7.5	8	8.8
3	11	14.1	13	7	30	17.2	7	7.7
4	45	57.7	28	15.1	36	20.7	4	4.4
Total	78	100	186	100	174	100	91	100



Seasonal Malaria Chemoprevention in Nigeria

Coverage Summary Report 2016 v2

Background: Seasonal Malaria Chemoprevention supported by the ACCESS-SMC project was introduced in 35 LGAs in Sokoto and Zamfara States in 2016. The first monthly cycle was delivered in late August /early September and the final cycle took place in late November / early December. Due to delays in supply of SMC drugs, it was not possible to deliver the 1st cycle in all 35 LGAs. There were 7 LGAs in Zamfara which did not do SMC in cycle 1, and 10 LGAs in Sokoto where cycle 1 was done only in selected wards within the LGA. The indicators in table 1 show the results for LGAs that received all 4 cycles, whilst the results in table 2 show the results for all areas combined.

It is important the SMC programme is monitored to ensure the intervention is delivered effectively reaching the children that need it. WHO recommends that children should receive all four monthly cycles, and should adhere to the treatment dose each month, in order to maximise protection and minimise selection for drug resistance. As part of the monitoring of the SMC programme in Nigeria, a coverage survey was carried out in late December/early January with support from the London School of Hygiene & Tropical Medicine, to determine the proportion of children that received each monthly treatment, and to ask about adherence to the treatment doses, and reasons for missed treatments.

Key messages:

In areas where 4 cycles were delivered in 2016, the reach of the SMC programme was been good, 90% of children received least one cycle of SMC.

Some caregivers reported their child had been treated, but had not received an SMC card. Only 62% of children were reported to have received an SMC card in 2016. 67% of those who received a card had retained the card by the time of the survey.

50% of eligible children received at least 3 cycles of SMC, and 30% received all 4 cycles.

When coverage at each of the four monthly cycles was assessed, coverage was lower in cycles 3 and 4 than in cycles 1 and 2 (63%, 60%, 37% and 20% for cycles 1,2,3 and 4 respectively).

A high proportion of children were reached by the programme but additional practical measures are needed to minimise the number of children who miss SMC treatments.

As in other countries implementing SMC, a high proportion of children above the age limit for SMC reported receiving SMC (63% of 6-7 year olds surveyed).

Bednet coverage was low, only 34% of children were reported to have slept under an insecticide treated net the night before the survey.

Key indicators 2016:

Number surveyed who were eligible for all 4 SMC cycles	931
Slept under a bednet last night	34.1%
Received an SMC card	62.0%
<i>Confirmed by card if available, otherwise from caregiver recall:</i>	
Received at least one cycle	89.6%
Received at least 3 cycles	50.1%
Received all 4 cycles	29.8%
Received no SMC	10.4%
For those that had SMC at the last cycle, adherence to all 3 doses	86.0%

Children 6-7yrs old who received SMC at least once	62.8%
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Table 1: Key indicators of SMC Coverage in LGAs that received all 4 cycles – Nigeria

Number children 3mons–7yrs included	1265					
Number eligible for all 4 SMC cycles \$	931					
	n/N	%	95% Confidence Interval			
Slept under a bednet last night	307/927	34.1	(22.9-47.3)			
Received SMC card	592/931	62.0	(48.5-73.9)			
Retained card if card received	394/931	66.7	(58.2-74.2)			
Received SMC cycle 1	589/931	62.9	(51.7-72.8)			
Received SMC cycle 2	561/931	60.3	(49.1-70.6)			
Received SMC cycle 3	343/931	37.4	(27.7-48.3)			
Received SMC cycle 4	183/931	19.5	(12.2-29.8)			
	Confirmed by card if available, otherwise recall			Maximum by card or recall		
No. of SMC cycles	n/N	%	95% Confidence Interval	n/N	%	95% Confidence Interval
0	105/931	11.9	(6.4-20.9)	92/931	10.4	(5.2-19.9)
1	185/931	20.1	(12.8-30.0)	172/931	18.8	(11.6-28.9)
2	205/931	20.7	(13.8-29.8)	206/931	20.7	(13.5-30.3)
3	183/931	19.1	(13.0-27.3)	194/931	20.3	(13.9-28.8)
4	253/931	28.3	(18.1-41.3)	267/931	29.8	(19.2-43.2)
Received no SMC*	92/931	10.4	(5.2-19.9)	92/931	10.4	(5.2-19.9)
Received at least one cycle	826/931	88.1	(79.1-93.6)	839/931	89.6	(80.1-94.8)
Received at least 3 cycles	436/931	47.4	(34.5-60.6)	461/931	50.1	(36.7-63.5)
Received all 4 cycles	253/931	28.3	(18.1-41.3)	267/931	29.8	(19.2-43.2)

Percentages are survey -weighted and will not equate exactly to n/N. Eligible is defined as aged at least 3 months at time of first cycle, and under 5 years at time of survey. *this is confirmed as no receipt, rather than failure to indicate receipt.

Report prepared for the NMEP by LSHTM with data supplied by Dr Musa Kana, ERIC

For Malaria Consortium: d.moroso@malariaconsortium.org; j.tibenderana@malariaconsortium.org

Table 2: Key indicators of SMC Coverage – Nigeria. All areas combined.

Number children 3mons–7yrs included	2221					
Number eligible for all 4 SMC cycles \$	1662					
	n/N	%	95% Confidence Interval			
Slept under a bednet last night	623/1651	38.4	(29.0-48.9)			
Received SMC card	1084/1662	64.4	(54.3-73.4)			
Retained card if card received	810/1084	75.2	(68.7-80.7)			
Received SMC cycle 1	835/1662	49.4	(39.9-58.9)			
Received SMC cycle 2	927/1662	55.9	(46.9-64.5)			
Received SMC cycle 3	636/1662	38.6	(30.6-47.3)			
Received SMC cycle 4	271/1662	16.0	(10.8-23.2)			
	Confirmed by card if available, otherwise recall			Maximum by card or recall		
No. of SMC cycles	n/N	%	95% Confidence Interval	n/N	%	95% Confidence Interval
0	254/1662	15.9	(10.0-24.4)	238/1662	14.9	(9.0-23.7)
1	320/1662	19.4	(13.2-27.6)	296/1662	18.0	(12.0-26.2)
2	368/1662	21.2	(15.8-27.8)	370/1662	21.2	(15.7-28.2)
3	400/1662	24.1	(17.6-32.2)	419/1662	25.2	(18.6-33.3)
4	320/1662	19.4	(12.5-28.8)	339/1662	20.6	(13.4-30.1)
Received no SMC*	238/1662	14.9	(9.0-23.7)	238/1662	14.9	(9.0-23.7)
Received at least one cycle	1408/1662	84.1	(75.6-90.0)	1424/1662	85.1	(76.3-91.0)
Received at least 3 cycles	720/1662	43.5	(34.0-53.6)	758/1662	45.8	(36.0-55.9)
Received all 4 cycles	320/1662	19.4	(12.5-28.8)	339/1662	20.6	(13.4-30.1)

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ACCESS-SMC evaluation: Report on assessment of protective efficacy of SMC treatments

Introduction
Methods
Results
Conclusions
Annex

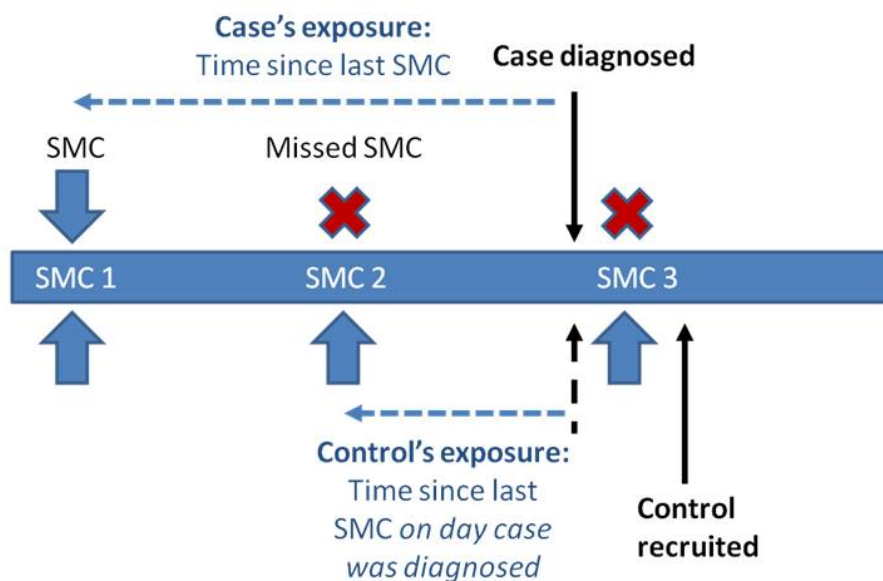
Introduction:

Case control studies are used to determine the protective efficacy of vaccines and other preventive interventions used in public health programmes. In clinical trials SMC treatment provided about 91% protection over 3 weeks and 86% over 4 weeks (IPTc Working Group 2012, see Annex; note that the figure of 75% protection from the GRADES review (WHO 2012) is an average figure over an entire transmission season in children who received three monthly treatments and therefore underestimates the actual protection over 4 weeks). It is important to confirm if this level of protection is being maintained in routine use in SMC programmes, as a number of factors (drug quality, poor administration, poor adherence, and the presence of illnesses which affect absorption of the drugs), could limit treatment efficacy in practice if SMC delivery is not well supervised. SMC will increase selection pressure for drug resistance, efficacy of SMC treatments therefore needs to be regularly monitored to provide early warning of any loss of efficacy. It is not ethically acceptable to compare malaria incidence in treated and untreated children in a cohort study, but it is possible to determine efficacy by noting that children who develop malaria are less likely to have received SMC than children who remain free of malaria, so by comparing the proportion of malaria cases who had received SMC in the previous 4 weeks, with the proportion of children in the general population (the controls) who had received SMC in the previous 4 weeks, the protective efficacy can be calculated. In clinical trials, protection from SMC was very high for about 28 days, then decreasing rapidly over the next 2 weeks, with no evidence of protection beyond 42 days. Therefore, in case control studies, we aim to measure protection over the first 28 days in children who received SMC, compared to children who received SMC more than 42 days previously or did not receive SMC. We also aim to show that protection decreases after 28 days, and there is no protection after 42 days, as expected, in order to validate the methodology.

Methods:

Case control studies were conducted in 5 countries (Burkina Faso, Chad, The Gambia, Mali, Nigeria). Sites aimed to recruit a set quota of cases each week in order to meet the required sample size and to ensure cases were recruited uniformly during the transmission period. Children over three months and under 5 years of age presenting at health facilities with fever and suspected to have malaria, were screened to exclude other causes of the fever and to confirm the presence of malaria infection using microscopy. Rapid Diagnostic Tests (RDTs) are known to give some false positive results, it is important to exclude these by examining blood films to confirm malaria infection, as inclusion of children with another illness than malaria among the cases would give the impression that SMC was not working. Confirmed cases were enrolled as cases, and a field worker then visited the child's home later the same day or on the following day, to ask about SMC treatments and to determine the dates of any SMC treatments the child had, inspecting the SMC card and asking the caregiver and other family members, and checking with administrative records the dates when SMC was delivered in that village. Other information about factors that might influence the child's risk of malaria, the child's access to health care, and the child's access to SMC, was also collected. The field worker then visited other compounds in the neighbourhood to recruit control children, avoiding

compounds in the immediate vicinity of the home of the malaria case. All children aged over three months and under 5 years were eligible to be chosen as controls, including any child who was unwell and might have had malaria (such children would be included but would then be referred to the health centre). Interviewers noted each household approached and each child invited to participate, in order to confirm participation rates among potential controls. For this study it was not possible to recruit controls at the health facility from among those presenting with another illness or from among those who tested negative for malaria. The purpose of the controls is to determine the proportion of children who had received SMC, who were at risk of malaria at the moment the case developed malaria. This includes those who developed malaria at the same moment as the case, and those who did not have clinical malaria (some of whom may nevertheless be carrying malaria parasites and would be positive if tested but do not have symptoms). Therefore controls have to be chosen from the community, not from those presenting at the clinic.



Each study site performed quality control of microscopy, and monitors from LSHTM and from Universite Cheikh Anta Diop visited to check that the study protocol was being followed. Data were collected on tablet PCs except in Nigeria where data were collected using paper forms and then entered into a computer database, and for quality control a sample of forms were scanned and checked against the dataset. To validate the case control methodology, a method yielded an estimate of zero protection from SMC for SMC treatments received more than 42 days ago.

Results:

In total 820 cases and 1637 controls were recruited in 2015, and 1433 cases and 2867 controls in 2016. The dataset from Nigeria did not pass quality control when compared against scanned forms, and are being independently re-entered. The results for Burkina Faso, Chad, The Gambia, and Mali, gave an overall estimate of efficacy of 89% over 28 days after SMC treatment (95% confidence interval 78% to 95%). The estimates from individual studies ranged from 73% to 98%, this variation may reflect slight differences in the timing of recruitment of cases rather than differences in true efficacy. There was no evidence of any change in efficacy between 2015 and 2016. Efficacy 29-42 days post treatment was 62% (95% confidence interval 46% to 73%). The detailed results for each study, including estimates of the efficacy of insecticide-treated bednets, are given in the Annex.

Conclusions:

These results confirm that SMC treatments are providing a very high degree of personal protection from malaria for a period of 28 days after each treatment. Protection then declines rapidly emphasising the importance of repeating treatments at monthly intervals. The studies validate the use of the case control method for monitoring efficacy of SMC. Case control studies should be repeated at intervals of no more than 3 years in order to check efficacy of SMC is being maintained. Case control studies require close attention to methodology, careful supervision, and specialist analysis, and should be undertaken by suitably qualified scientific teams.

Figure 1: Efficacy of SMC from case control studies 2015-2016, over 28 days post treatment.

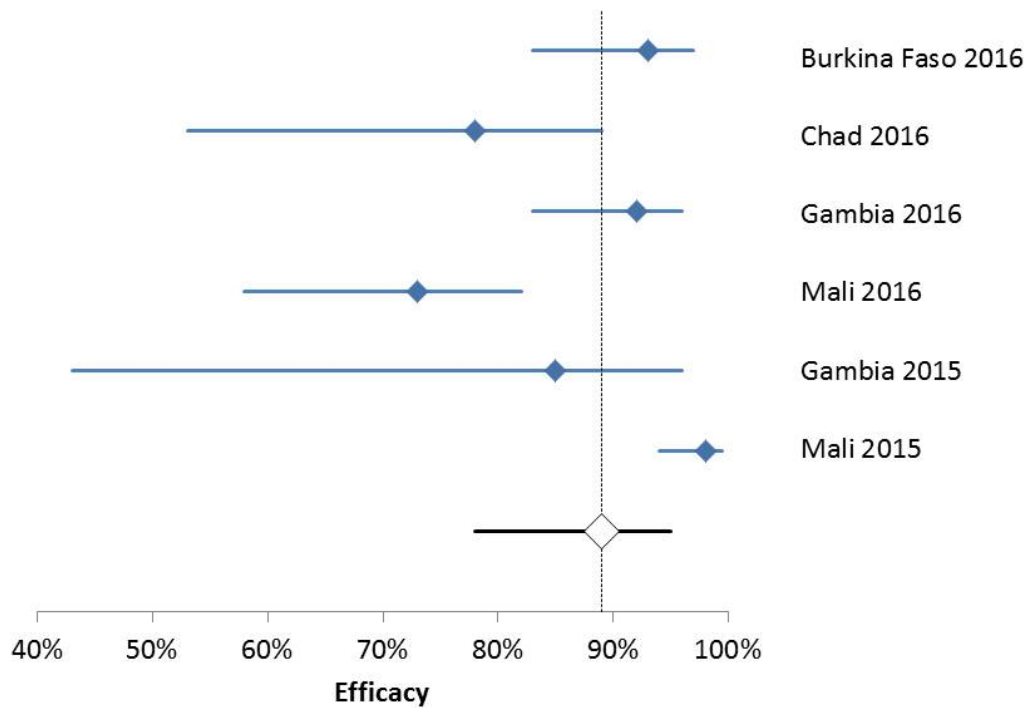


Figure 2: Efficacy over 28 days and days 29-42 post treatment. Efficacy decays rapidly after 4 weeks.

Efficacy of SMC from case control studies

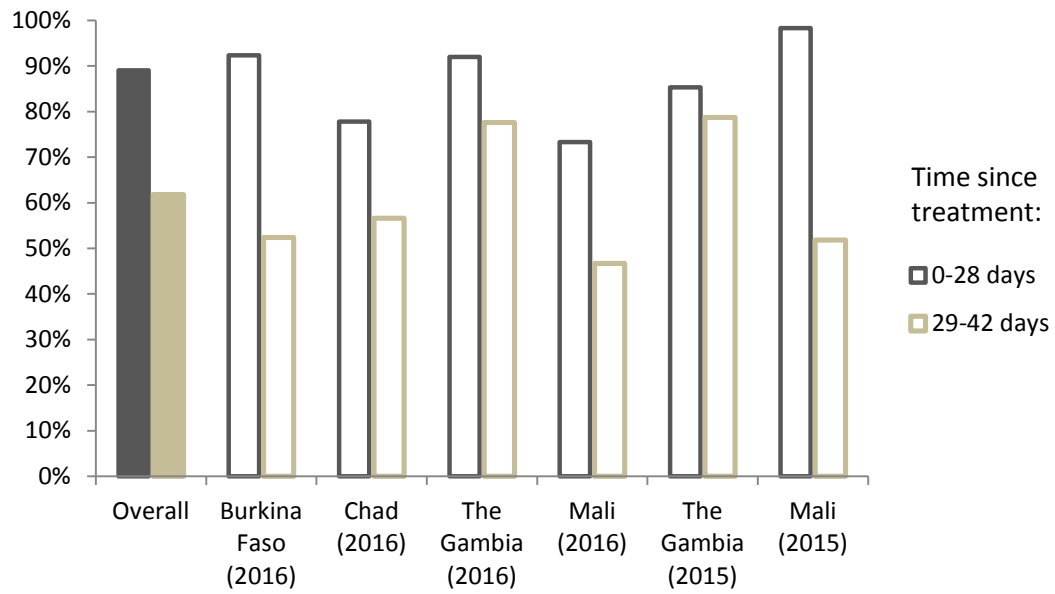
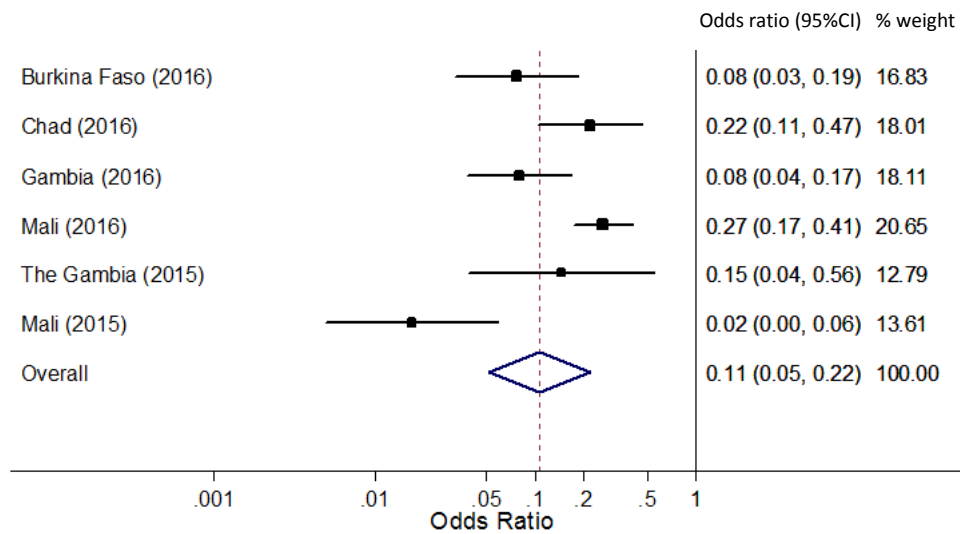


Figure 3: Odds ratios for the efficacy of SMC over 28 days after treatment showing the contribution of each study to the overall estimate.



References:

IPTc Working Group (2012) Implementation of Seasonal Malaria Chemoprevention: Additional information for a WHO Technical Expert Group. Unpublished report.

World Health Organization (2012) WHO Policy Recommendation: Seasonal Malaria Chemoprevention (SMC) for *Plasmodium falciparum* malaria control in highly seasonal transmission areas of the Sahel sub-region in Africa. March 2012. (In English and French). http://www.who.int/malaria/publications/atoz/who_smc_policy_recommendation/en/index.html

Efficacy

Annex 1:

Case control study results

Table A1. Exposure status and covariates for cases and controls – 2016

Table A2. Summary of SMC effect in 6 studies (4 in 2016, 2 in 2015)

Table A3. Burkina Faso – 2016

Table A4. Chad - 2016

Table A5. Gambia - 2016

Table A6. Mali - 2016

Table A7. Gambia – 2015

Table A8. Mali – 2015

Table A9. Exposure status of cases and controls, 2016

Table A9. Exposure status of cases and controls, 2016

Figure A1: Efficacy of SMC in relation to time since start of treatment, from clinical trial data

Table A1. Exposure status and covariates for cases and controls - 2016

		Burkina Faso				Chad				Mali				The Gambia			
		Controls		Cases		Controls		Cases		Controls		Cases		Controls		Cases	
		N	%	n	%	N	%	N	%	N	%	n	%	N	%	n	%
Last SMC	< 28 days	666	72.5	273	59.5	80	20.1	24	12.1	246	36.2	68	20.1	394	79.4	142	57.3
	29-42 days	189	20.6	115	25.1	29	7.3	10	5.0	78	11.5	37	10.9	63	12.7	35	14.1
	43+ days	63	6.9	71	15.5	289	72.6	165	82.9	355	52.3	234	69.0	39	7.9	71	28.6
	missing	-	-	-	-	-	-	-	-	3	-	2	-	-	-	-	-
Age (years)	0	47	5.1	26	5.7	64	16.1	27	13.6	107	15.7	12	3.5	61	12.3	7	2.8
	1	185	20.2	85	18.5	105	26.4	43	21.6	134	19.6	33	9.7	102	20.6	33	13.3
	2	266	29	133	29	133	33.4	53	26.6	135	19.8	86	25.2	125	25.2	70	28.2
	3	208	22.7	103	22.4	65	16.3	33	16.6	137	20.1	94	27.6	101	20.4	69	27.8
	4	212	23.1	112	24.4	31	7.8	43	21.6	169	24.8	116	34	107	21.6	69	27.8
LLIN	no	23	2.5	31	6.8	243	61.1	112	56.3	21	3.1	9	2.6	71	14.3	38	15.3
	yes	886	96.5	427	93	153	38.4	87	43.7	652	95.6	326	95.6	424	85.5	208	83.9
Last Night	missing	9	1	1	0.2	2	0.5	0	0	9	1.3	6	1.8	1	0.2	2	0.8
SES	1) highest	183	19.9	35	7.6	50	12.6	17	8.5	136	19.9	73	21.4	99	20.0	88	35.5
	2) high	183	19.9	86	18.7	98	24.6	30	15.1	136	19.9	70	20.5	99	20.0	51	20.6
	3) average	183	19.9	160	34.9	82	20.6	50	25.1	136	19.9	69	20.2	99	20.0	46	18.5
	4) low	183	19.9	111	24.2	88	22.1	47	23.6	136	19.9	65	19.1	99	20.0	23	9.3
	5) lowest	183	19.9	64	13.9	80	20.1	55	27.6	137	20.1	61	17.9	100	20.2	40	16.1
Education*	0) Least	663	72.2	383	83.4	29	7.3	21	10.6	486	71.3	233	68.3	402	81	208	83.9
	1)	129	14.1	55	12	131	32.9	82	41.2	57	8.4	25	7.3	93	18.8	40	16.1
	2)	108	11.8	19	4.1	131	32.9	45	22.6	71	10.4	46	13.5	-	-	-	-
	3)	-	-	-	-	107	26.9	51	25.6	68	10	37	10.9	-	-	-	-
	missing	18	2	2	0.4	-	-	-	-	-	-	-	-	1	0.2	0	0

*Education categories. **BF:** 0) none, 1) primary, 2) Secondary/Higher; **Chad, Mali** 0) None, 1) Koranic, 2) Primary, 3) Secondary/Higher; **The Gambia:** 0) None/Koranic, 1) Primary/Higher

Table A2. Summary of SMC effect in 6 studies (4 in 2016, 2 in 2015)

Study	SMC	Crude OR	95% CI	P-value	Adjusted OR	95% CI	P-value	PE	95% CI
Burkina Faso 2016	within 28 days	0.047	(0.020, 0.113)	0.000	0.077	(0.032, 0.185)	0.000	92.3	(81.5, 96.8)
	29-42 days ago	0.310	(0.129, 0.743)	0.009	0.476	(0.183, 1.237)	0.128	52.4	(-23.7, 81.7)
	43+ days ago	-	-	-	-	-	-	-	-
Chad 2016	within 28 days	0.317	(0.163, 0.618)	0.001	0.222	(0.105, 0.469)	0.000	77.8	(53.1, 89.5)
	29-42 days ago	0.442	(0.169, 1.161)	0.098	0.434	(0.150, 1.256)	0.124	56.6	(-25.6, 85.0)
	43+ days ago	-	-	-	-	-	-	-	-
Gambia 2016	within 28 days	0.081	(0.041, 0.159)	0.000	0.080	(0.038, 0.166)	0.000	92.0	(83.4, 96.2)
	29-42 days ago	0.267	(0.121, 0.588)	0.001	0.224	(0.093, 0.537)	0.001	77.6	(46.3, 90.7)
	43+ days ago	-	-	-	-	-	-	-	-
Mali 2016	within 28 days	0.294	(0.201, 0.431)	0.000	0.267	(0.175, 0.408)	0.000	73.3	(59.2, 82.5)
	29-42 days ago	0.637	(0.389, 1.042)	0.073	0.533	(0.311, 0.911)	0.021	46.7	(8.9, 68.9)
	43+ days ago	-	-	-	-	-	-	-	-
Gambia 2015	within 28 days	0.131	(0.035, 0.487)	0.002	0.147	(0.039, 0.560)	0.005	85.3	(44.0, 96.1)
	29-42 days ago	0.207	(0.092, 0.467)	0.000	0.213	(0.093, 0.488)	0.000	78.7	(51.2, 90.7)
	43+ days ago	-	-	-	-	-	-	-	-
Mali 2015	within 28 days	0.022	(0.007, 0.070)	0.000	0.017	(0.005, 0.059)	0.000	98.3	(94.1, 99.5)
	29-42 days ago	0.473	(0.171, 1.308)	0.149	0.482	(0.162, 1.432)	0.189	51.8	(-43.2, 83.8)
	43+ days ago	-	-	-	-	-	-	-	-

Note on tables showing protective efficacy of SMC: Data on use of previous antimalarial was collected in 2016. In three centres this was relatively rarely reported (6 times in Gambia 2016, 34 times each in Burkina Faso and Mali) and adjusting for prior treatment made very little difference to model estimates. The exception was Chad, 2016, where recent treatment with an antimalarial was commonly reported (by 17.1% of controls and 29.6% of cases). Adjustment for this in addition to the other covariates resulted in estimate of protective efficacy of 73.4% (40.2, 88.2) in the first 28 days, and 49.6% (-47.3, +82.8) between 29-42 days.

Table A3. Burkina Faso – 2016

	Crude OR	95% CI	P-value	Adjusted OR	95% CI	P-value	PE	95% CI
SMC								
within 28 days	0.047	(0.020, 0.113)	0.000	0.077	(0.032, 0.185)	0.000	92.3	(81.5, 96.8)
29-42 days ago	0.310	(0.129, 0.743)	0.009	0.476	(0.183, 1.237)	0.128	52.4	(-23.7, 81.7)
43+ days ago	-	-	-	-	-	-		
Age								
under 1 year	0.905	(0.391, 2.092)	0.815	1.101	(0.396, 3.057)	0.854		
1 year	0.681	(0.371, 1.250)	0.215	0.629	(0.302, 1.310)	0.215		
2 years	0.780	(0.444, 1.370)	0.387	0.730	(0.374, 1.426)	0.357		
3 years	0.819	(0.483, 1.390)	0.460	0.676	(0.363, 1.261)	0.218		
4 years	-	-	-	-	-	-		
LLIN								
Yes	0.352	(0.197, 0.628)	0.000	0.502	(0.253, 0.995)	0.048	49.8	(0.50, 74.7)
No	-	-	-	-	-	-		
SES								
Highest	-	-	-	-	-	-		
High	4.051	(2.413, 6.800)	0.000	2.954	(1.667, 5.233)	0.000		
Medium	12.983	(7.091, 23.773)	0.000	7.621	(3.917, 14.828)	0.000		
Low	10.135	(5.299, 19.385)	0.000	5.932	(2.911, 12.086)	0.000		
Lowest	5.646	(2.818, 11.310)	0.000	3.632	(1.719, 7.676)	0.001		
Education								
None	-	-	-	-	-	-		
Primary/Koranic	0.625	(0.432, 0.903)	0.012	0.956	(0.617, 1.480)	0.839		
Secondary/College	0.250	(0.145, 0.430)	0.000	0.417	(0.224, 0.778)	0.006		

Table A4. Chad - 2016

	Crude OR	95% CI	P-value	Adjusted OR	95% CI	P-value	PE	95% CI
SMC								
within 28 days	0.317	(0.163, 0.618)	0.001	0.222	(0.105, 0.469)	0.000	77.8	(53.1, 89.5)
29-42 days ago	0.442	(0.169, 1.161)	0.098	0.434	(0.150, 1.256)	0.124	56.6	(-25.6, 85.0)
43+ days ago	-	-	-	-	-	-		
Age								
under 1 year	0.285	(0.146, 0.558)	0.000	0.246	(0.119, 0.512)	0.000		
1 year	0.263	(0.141, 0.491)	0.000	0.227	(0.115, 0.448)	0.000		
2 years	0.265	(0.147, 0.479)	0.000	0.266	(0.142, 0.500)	0.000		
3 years	0.322	(0.166, 0.627)	0.001	0.332	(0.164, 0.670)	0.002		
4 years	-	-	-	-	-	-		
LLIN								
Yes	1.459	(0.919, 2.317)	0.109	1.328	(0.796, 2.215)	0.277	-32.8	(-121.50, 20.4)
No	-	-	-	-	-	-		
SES								
Highest	-	-	-	-	-	-		
High	0.982	(0.489, 1.973)	0.960	0.790	(0.379, 1.648)	0.530		
Medium	2.332	(1.133, 4.797)	0.021	1.961	(0.909, 4.230)	0.086		
Low	2.482	(1.128, 5.462)	0.024	2.717	(1.184, 6.238)	0.018		
Lowest	3.020	(1.426, 6.399)	0.004	3.371	(1.521, 7.472)	0.003		
Education								
None	-	-	-	-	-	-		
Koranic	0.884	(0.413, 1.893)	0.751	1.013	(0.431, 2.383)	0.976		
Primary	0.475	(0.230, 0.981)	0.044	0.458	(0.206, 1.015)	0.054		
Secondary / College	0.602	(0.286, 1.268)	0.182	0.661	(0.288, 1.518)	0.329		

Table A5. Gambia - 2016

	Crude OR	95% CI	P-value	Adjusted OR	95% CI	P-value	PE	95% CI
SMC								
within 28 days	0.081	(0.041, 0.159)	0.000	0.080	(0.038, 0.166)	0.000	92.0	(83.4, 96.2)
29-42 days ago	0.267	(0.121, 0.588)	0.001	0.224	(0.093, 0.537)	0.001	77.6	(46.3, 90.7)
43+ days ago	-	-	-	-	-	-		
Age								
under 1 year	0.180	(0.077, 0.420)	0.000	0.194	(0.076, 0.491)	0.001		
1 year	0.508	(0.309, 0.837)	0.008	0.485	(0.274, 0.858)	0.013		
2 years	0.849	(0.552, 1.305)	0.455	0.799	(0.478, 1.335)	0.392		
3 years	1.015	(0.661, 1.559)	0.945	1.144	(0.692, 1.893)	0.599		
4 years	-	-	-	-	-	-		
LLIN								
Yes	0.916	(0.571, 1.469)	0.715	1.296	(0.717, 2.341)	0.390	-29.6	(-134.10, 28.3)
No	-	-	-	-	-	-		
SES								
Highest	-	-	-	-	-	-		
High	0.531	(0.333, 0.846)	0.008	0.554	(0.332, 0.924)	0.024		
Medium	0.405	(0.243, 0.673)	0.000	0.348	(0.195, 0.622)	0.000		
Low	0.194	(0.105, 0.355)	0.000	0.217	(0.109, 0.430)	0.000		
Lowest	0.297	(0.165, 0.534)	0.000	0.277	(0.142, 0.541)	0.000		
Education								
None or Koranic	-	-	-	-	-	-		
Primary or Higher	0.816	(0.531, 1.254)	0.354	0.731	(0.440, 1.215)	0.227		

Table A6. Mali - 2016

	Crude OR	95% CI	P-value	Adjusted OR	95% CI	P-value	PE	95% CI
SMC								
within 28 days	0.294	(0.201, 0.431)	0.000	0.267	(0.175, 0.408)	0.000	73.3	(59.2, 82.5)
29-42 days ago	0.637	(0.389, 1.042)	0.073	0.533	(0.311, 0.911)	0.021	46.7	(8.9, 68.9)
43+ days ago	-	-	-	-	-	-		
Age								
under 1 year	0.161	(0.083, 0.312)	0.000	0.158	(0.079, 0.316)	0.000		
1 year	0.358	(0.227, 0.563)	0.000	0.387	(0.237, 0.630)	0.000		
2 years	0.949	(0.657, 1.370)	0.778	1.042	(0.698, 1.557)	0.839		
3 years	1.035	(0.721, 1.486)	0.853	1.192	(0.805, 1.764)	0.381		
4 years	-	-	-	-	-	-		
LLIN								
Yes	1.186	(0.522, 2.694)	0.683	1.264	(0.504, 3.169)	0.617	-26.4	(-216.90, 49.6)
No	-	-	-	-	-	-		
SES								
Highest	-	-	-	-	-	-		
High	0.938	(0.603, 1.459)	0.777	0.931	(0.568, 1.524)	0.776		
Medium	0.941	(0.592, 1.498)	0.799	1.042	(0.626, 1.736)	0.874		
Low	0.847	(0.530, 1.353)	0.487	0.866	(0.521, 1.439)	0.579		
Lowest	0.730	(0.426, 1.251)	0.252	0.747	(0.411, 1.359)	0.340		
Education								
None	-	-	-	-	-	-		
Koranic	0.921	(0.550, 1.541)	0.753	0.730	(0.408, 1.304)	0.287		
Primary	1.373	(0.905, 2.084)	0.136	1.233	(0.761, 1.997)	0.395		
Secondary / College	1.168	(0.733, 1.860)	0.513	1.030	(0.608, 1.742)	0.914		

Table A7. Gambia – 2015

	Crude OR	95% CI	P-value	Adjusted OR	95% CI	P-value	PE	95% CI
SMC								
within 28 days	0.131	(0.035, 0.487)	0.002	0.147	(0.039, 0.560)	0.005	85.3	(44.0, 96.1)
29-42 days ago	0.207	(0.092, 0.467)	0.000	0.213	(0.093, 0.488)	0.000	78.7	(51.2, 90.7)
43+ days ago	-	-	-	-	-	-		
Age								
under 1 year	0.266	(0.102, 0.695)	0.007	0.240	(0.087, 0.659)	0.006		
1 year	0.426	(0.250, 0.728)	0.002	0.434	(0.245, 0.769)	0.004		
2 years	0.763	(0.468, 1.242)	0.276	0.743	(0.440, 1.252)	0.264		
3 years	0.959	(0.597, 1.543)	0.864	0.863	(0.518, 1.438)	0.573		
4 years	-	-	-	-	-	-		
LLIN								
Yes	0.421	(0.269, 0.659)	0.000	0.497	(0.308, 0.801)	0.004	50.3	(19.90, 69.2)
No	-	-	-	-	-	-		
SES								
Highest	-	-	-					
High	0.750	(0.405, 1.387)	0.359					
Medium	0.726	(0.387, 1.361)	0.318					
Low	0.576	(0.280, 1.184)	0.133					
Lowest	0.470	(0.221, 0.999)	0.050					
Education								
None	-	-	-	-	-	-		
Koranic	0.749	(0.417, 1.344)	0.332	1.010	(0.522, 1.957)	0.975		
Primary/Secondary/C ollege	0.696	(0.349, 1.387)	0.303	0.983	(0.456, 2.119)	0.964		

Table A8. Mali – 2015

	Crude OR	95% CI	P-value	Adjusted OR	95% CI	P-value	PE	95% CI
SMC								
within 28 days	0.022	(0.007, 0.070)	0.000	0.017	(0.005, 0.059)	0.000	98.3	(94.1, 99.5)
29-42 days ago	0.473	(0.171, 1.308)	0.149	0.482	(0.162, 1.432)	0.189	51.8	(-43.2, 83.8)
43+ days ago	-	-	-	-	-	-		
Age								
under 1 year	0.143	(0.066, 0.307)	0.000	0.071	(0.019, 0.259)	0.000		
1 year	0.455	(0.266, 0.780)	0.004	0.388	(0.181, 0.830)	0.015		
2 years	0.574	(0.359, 0.916)	0.020	0.585	(0.273, 1.252)	0.167		
3 years	0.691	(0.461, 1.038)	0.075	0.689	(0.392, 1.211)	0.195		
4 years	-	-	-	-	-	-		
LLIN								
Yes	1.000	(0.329, 3.038)	1.000	0.318	(0.031, 3.266)	0.335	68.2	(-226.60, 96.9)
No	-	-	-	-	-	-		
SES								
Highest	-	-	-	-	-	-		
High	0.736	(0.443, 1.222)	0.236	0.655	(0.315, 1.360)	0.256		
Medium	0.638	(0.367, 1.108)	0.110	0.686	(0.321, 1.464)	0.330		
Low	0.691	(0.399, 1.196)	0.186	0.737	(0.350, 1.554)	0.423		
Lowest	0.536	(0.298, 0.965)	0.038	0.655	(0.293, 1.463)	0.302		
Education								
None	-	-	-	-	-	-		
Koranic	0.827	(0.444, 1.543)	0.551	1.168	(0.486, 2.803)	0.729		
Primary	1.339	(0.836, 2.143)	0.225	0.997	(0.450, 2.211)	0.994		
Secondary / College	0.513	(0.270, 0.973)	0.041	0.323	(0.123, 0.850)	0.022		

Table A9. Exposure status of cases and controls, 2016

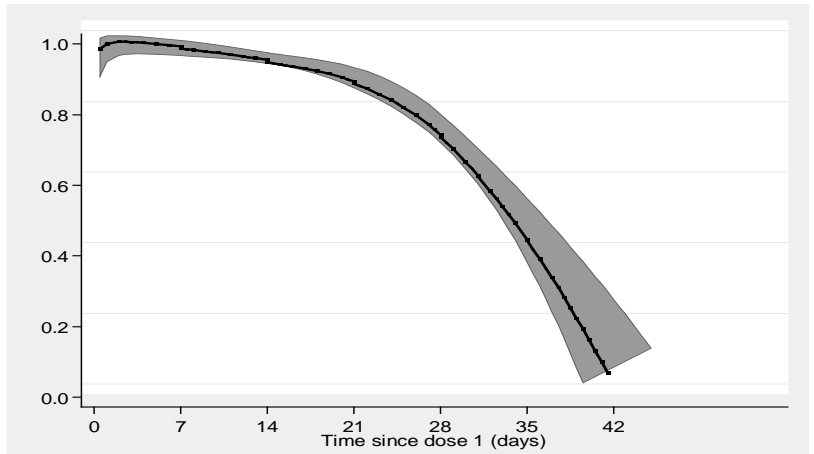
Case had SMC within past 28 days	Number of controls with SMC within past 28 days			Total
	0	1	2	
Burkina Faso				
No	114	7	65	186
Yes	5	7	261	273
Total	119	14	326	459
Chad				
No	142	14	19	175
Yes	7	6	11	24
Total	149	20	30	199
The Gambia				
No	34	16	56	106
Yes	2	14	126	142
Total	36	30	182	248
Mali				
Yes	163	52	56	271
No	13	29	26	68
Missing	1	1	0	2
Total	177	82	82	341

Table A10. Exposure status of cases and controls, 2015

Number of controls with SMC within past 28 days

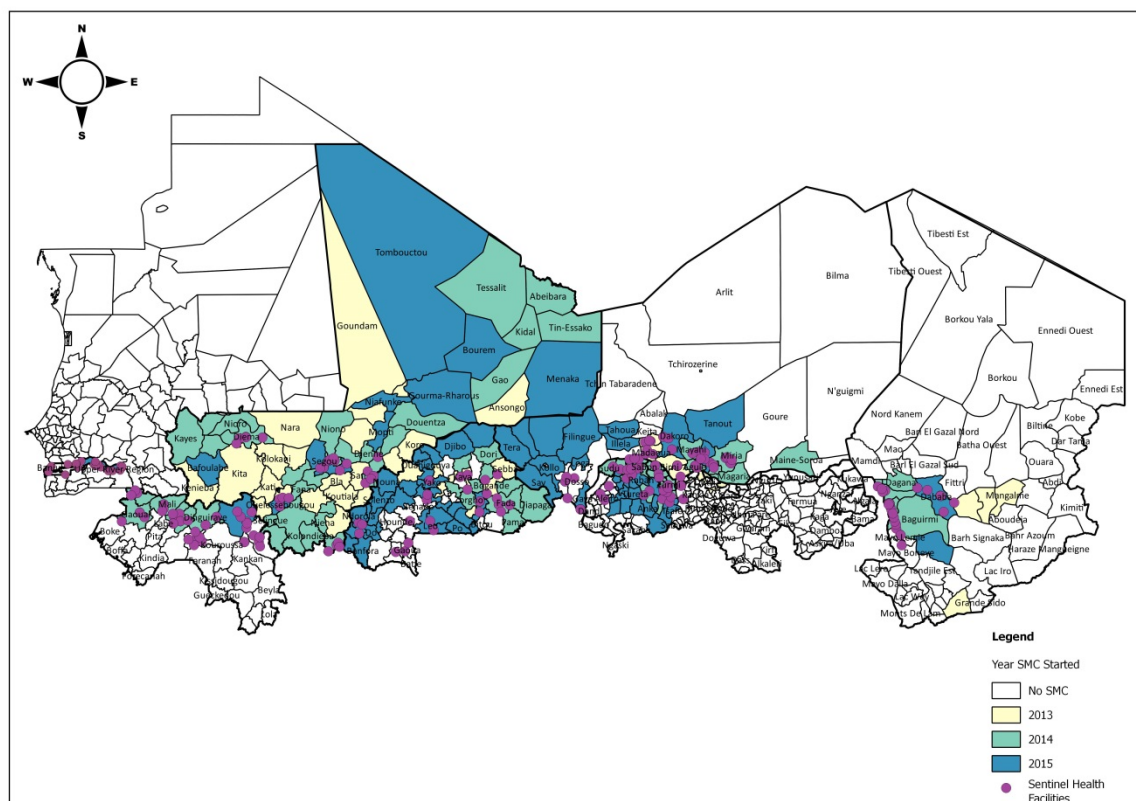
Case had SMC within past 28 days	0	1	2	Total
The Gambia (2015)				
No	189	6	8	203
Yes	0	5	13	18
Missing	4	1	0	5
Total	193	12	21	226
Mali (2015)				
No	112	42	51	205
Yes	0	5	10	15
Missing	19	5	8	32
Total	131	52	69	252

Figure A1: Efficacy of SMC in relation to time since start of treatment, from clinical trial data (IPTc Working Group 2012)



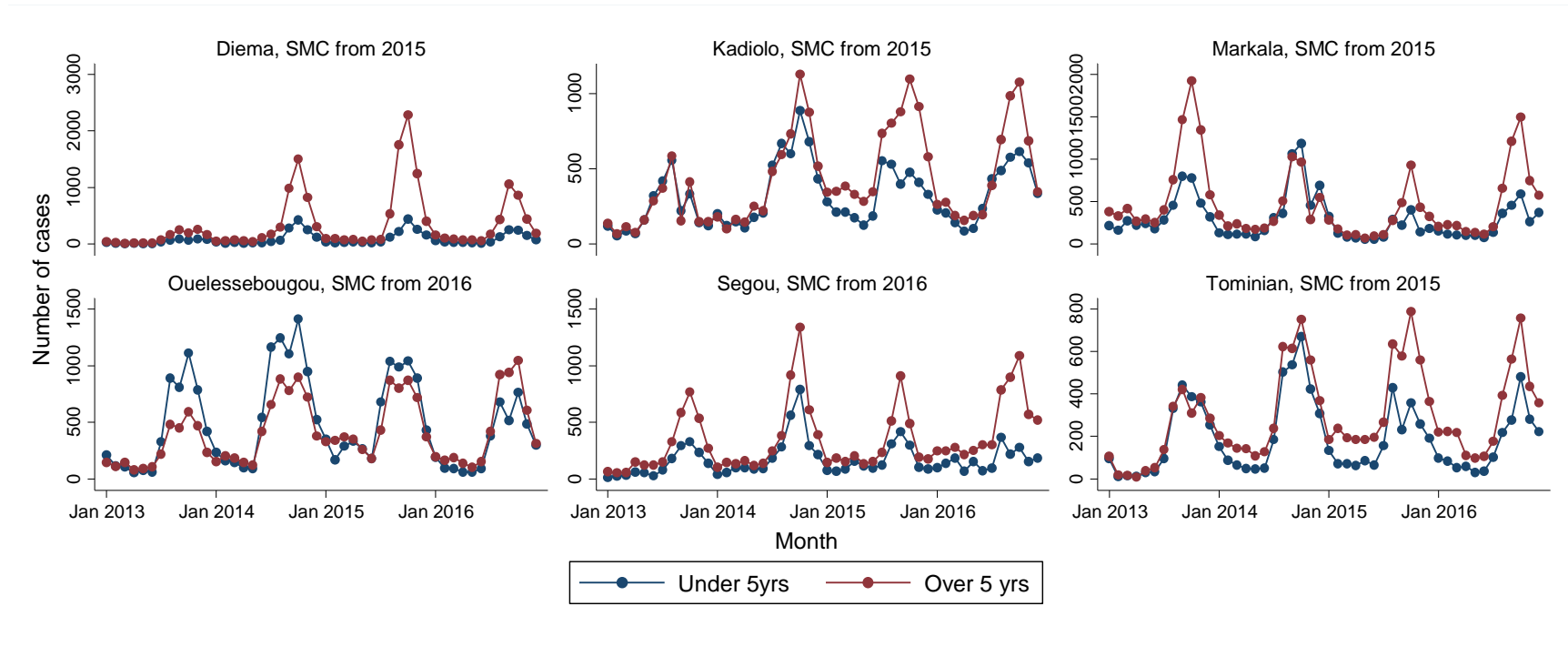
ACCESS-SMC Evaluation: Impact

Annex 1: Sentinel surveillance results



Mali

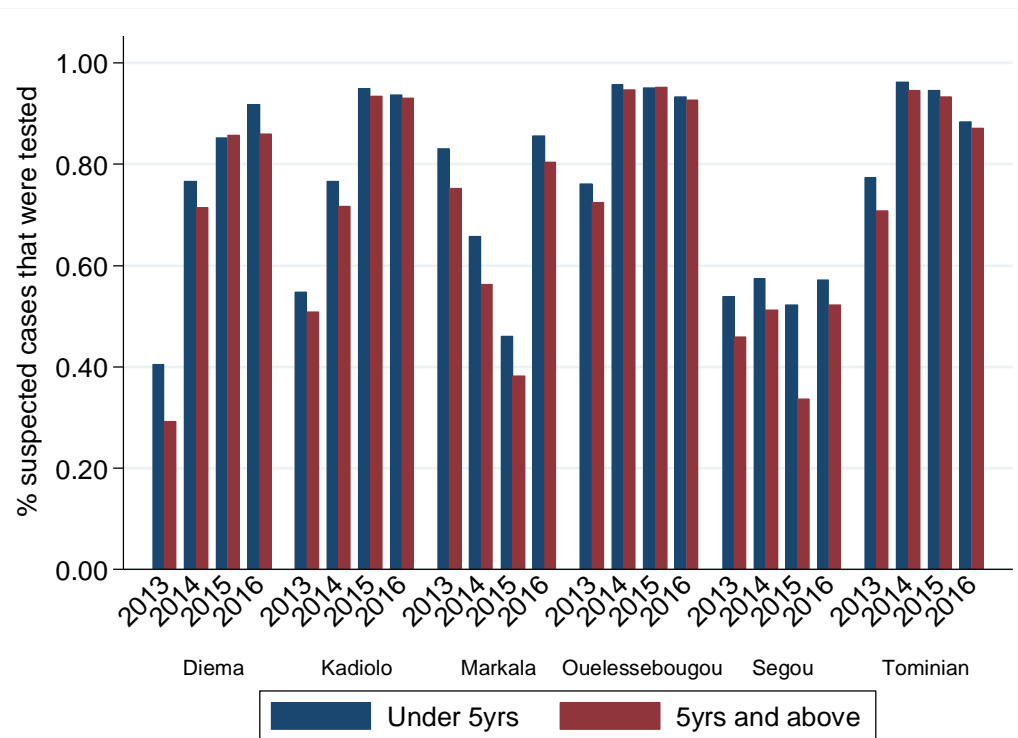
Sentinel surveillance in Mali: number of confirmed cases of malaria under 5yrs of age, and 5 years and above, from sentinel facilities in 6 districts.

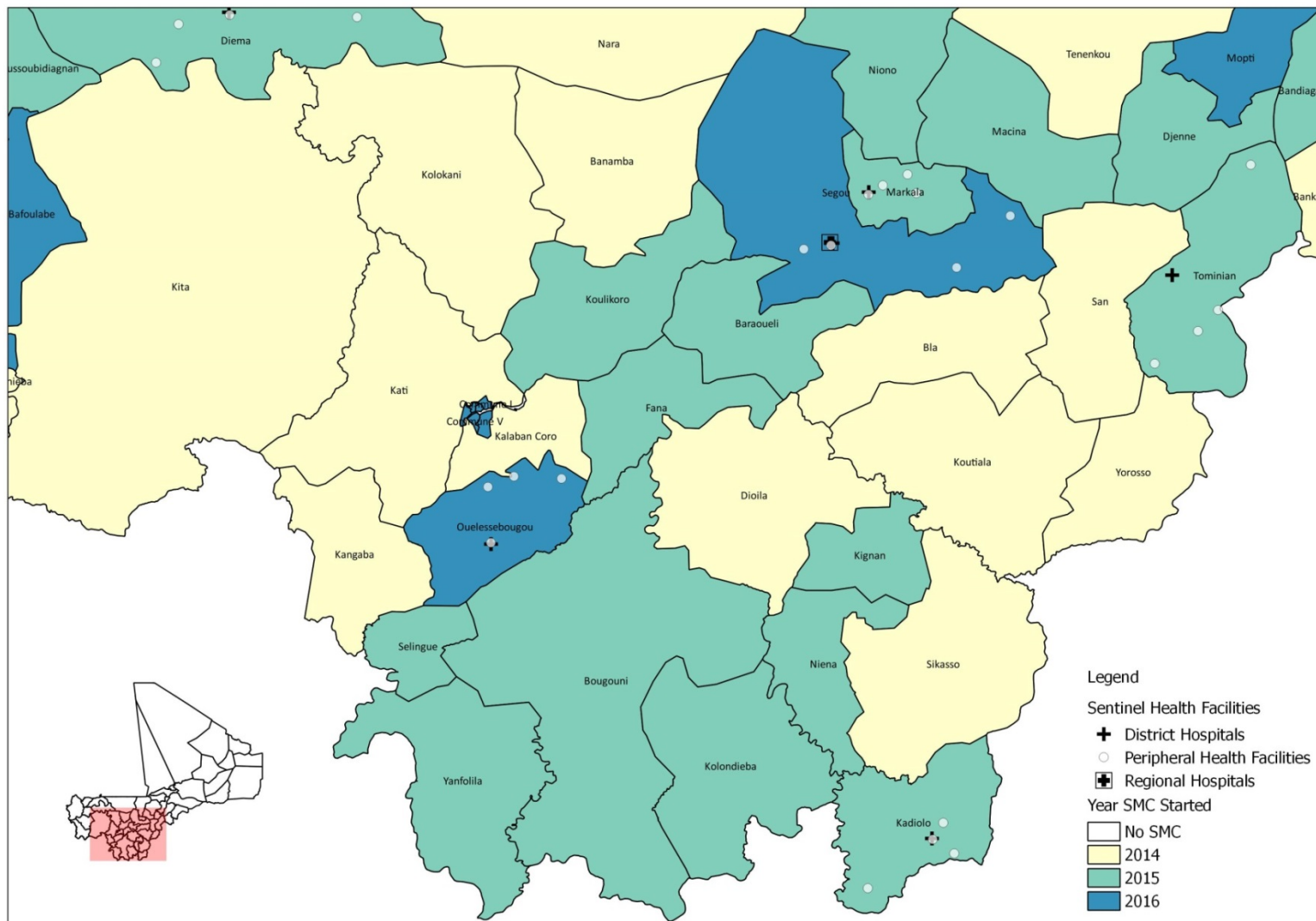


Estimates of the relative reduction in cases under 5 yrs following introduction of SMC:

District	Reduction (95%CI)
Diema	44% (41%, 47%)
Kadiolo	27% (24%, 29%)
Markala	54% (52%, 56%)
Ouelessebouyou	24% (21%, 28%)
Segou	47% (43%, 50%)
Tominian	30% (27%, 33%)
Overall	38% (36%, 39%)

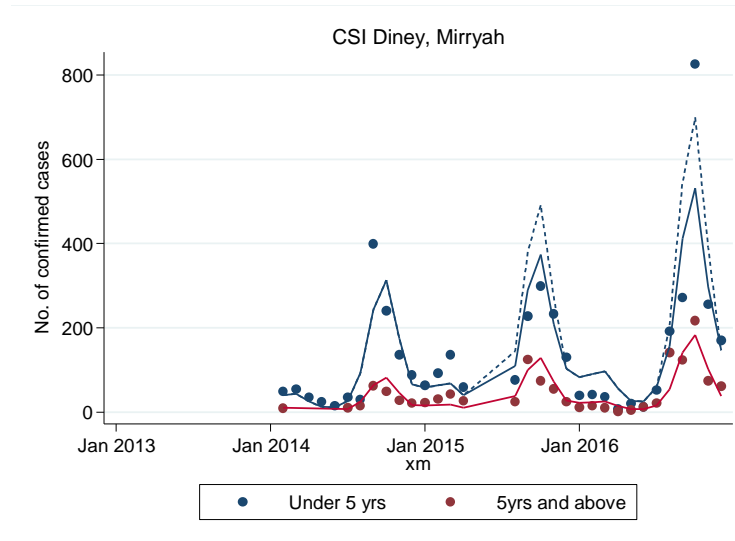
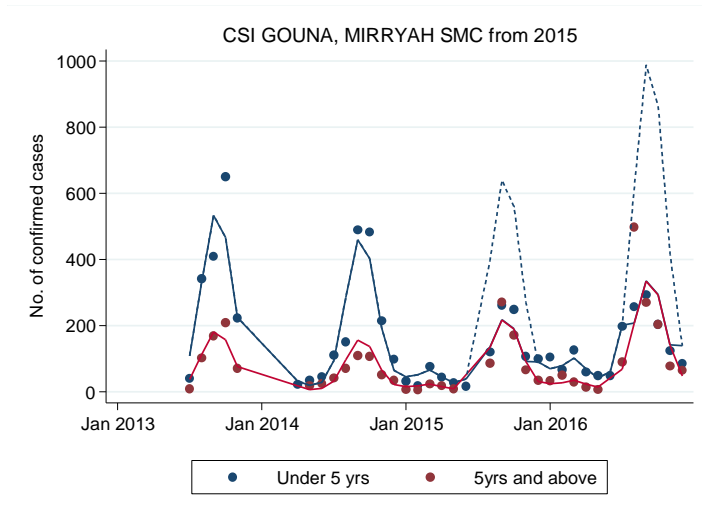
Testing rates in each age group, 2013-2016.

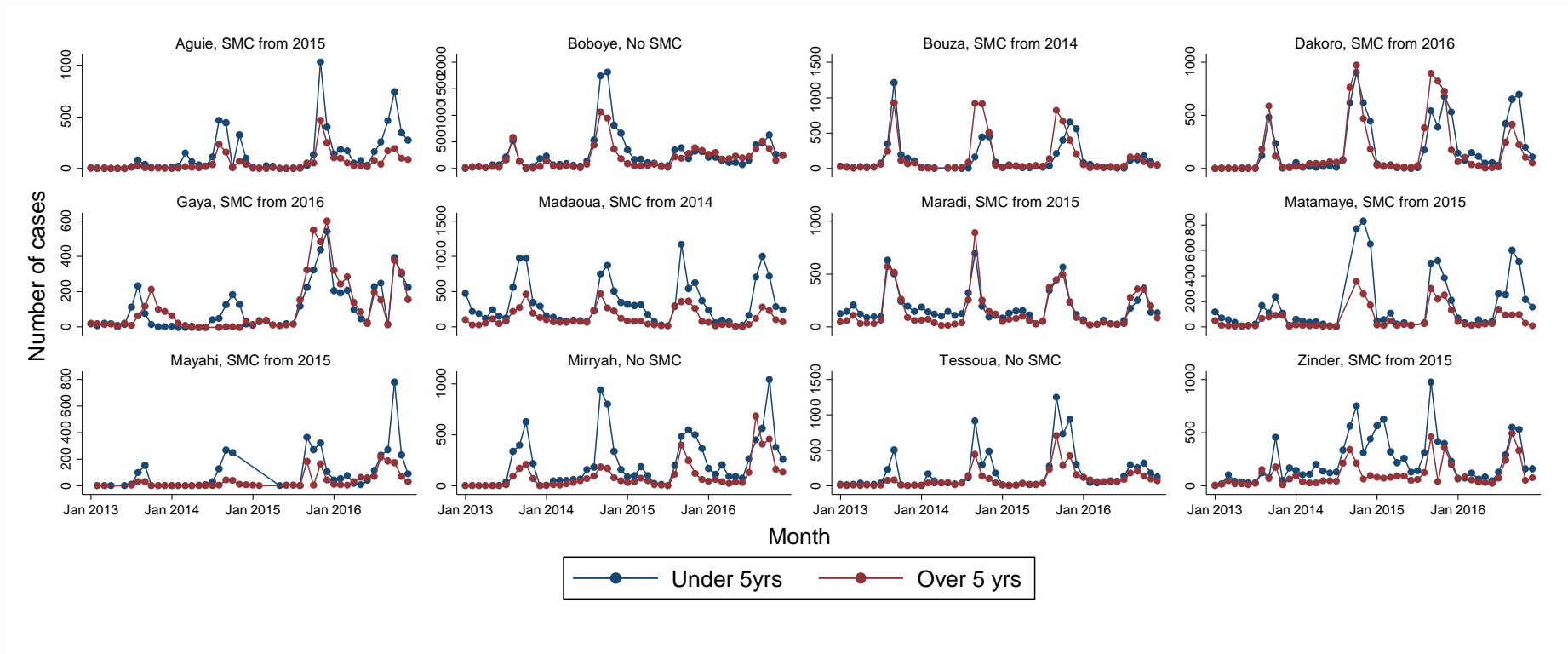




Niger

Sentinel surveillance in Niger: number of confirmed cases under 5 yrs and 5 yrs and above, in implementation and control

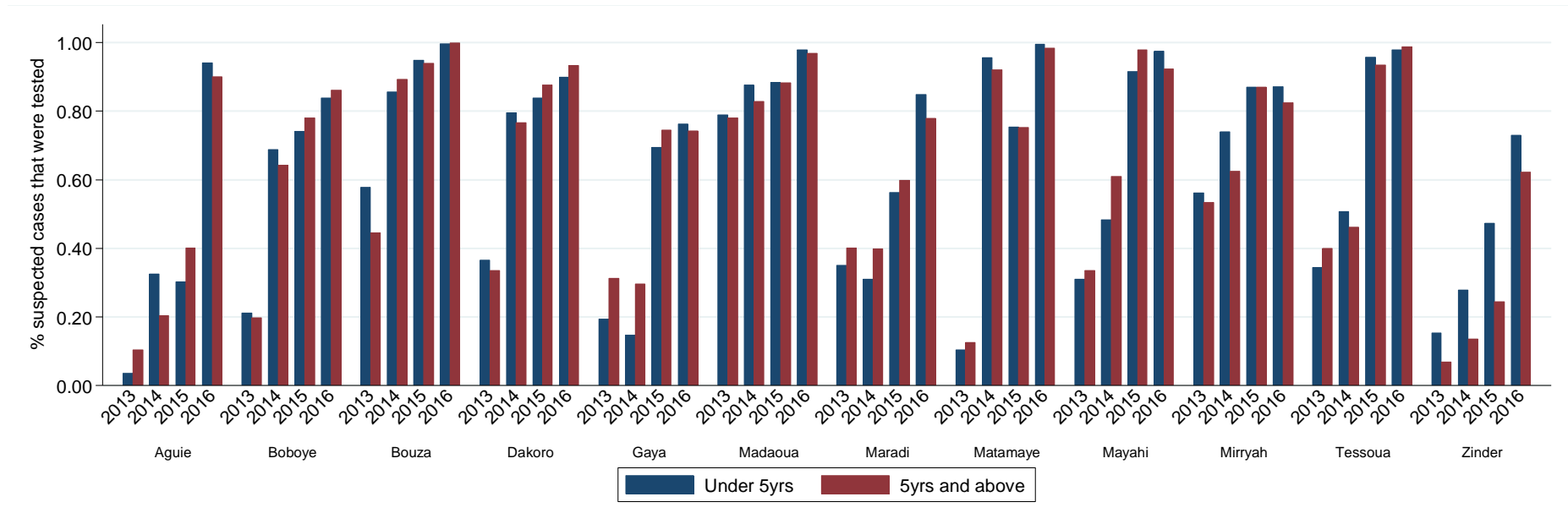


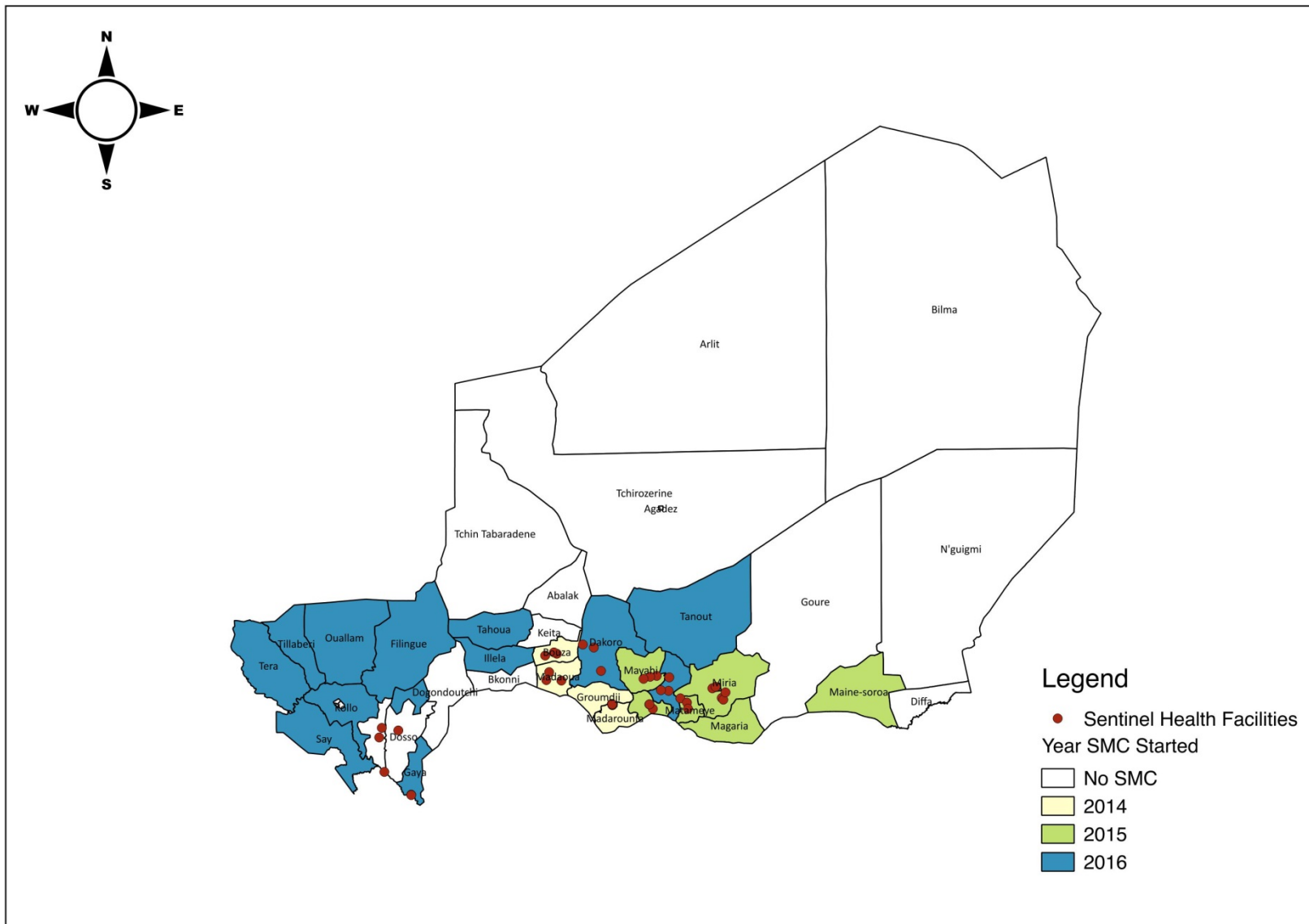


Estimated reduction in incidence in under 5's following introduction of SMC (95%CI):

Facility	District	Estimated reduction in incidence in under 5's following introduction of SMC (95%CI)
CSI GOUNA	MIRRYAH	70% (67%,72%)
CSI DINEY	MIRRYAH	19% (10%,27%)
CSI KANTCHE	MATAMAYE	6% (-2%,13%)
CSI DANGOUDAOU	MATAMAYE	47% (35%,57%)
CSI GANGARA	AGUIE	12% (-1%,23%)
CSI AGUIE	AGUIE	-4% (-16%,7%)
CSI ISSAWANE	MAYAH	48% (37%,57%)
CSI N'WALA	MAYAH	50% (39%,59%)
CSI TANDA	GAYA	6% (-7%,18%)
CSI GAYA 1	GAYA	43% (34%,50%)
CSI ANDOUME	MARADI	66% (62%,69%)
Overall		29% (1%,48%)

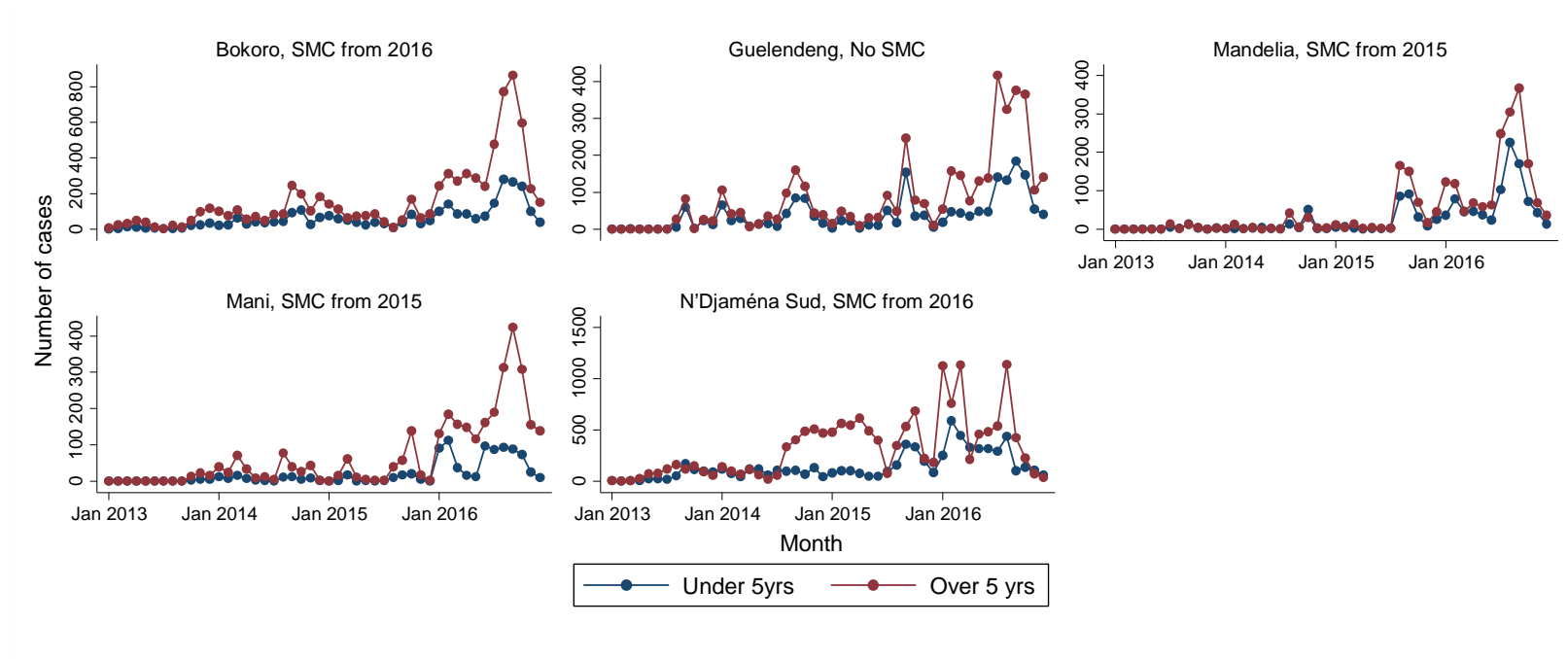
Testing rates over time, by region and age group:





Chad

Sentinel surveillance in Chad: number of confirmed cases under 5 yrs and 5 yrs and above, in implementation and control



Estimated reduction in confirmed cases under 5 yrs of age following introduction of SMC:

District	Reduction (95%CI)
Bokoro	14% (7%, 20%)
Manelia	(estimate not possible because of low testing rate pre-SMC)
Mani	25% (16%, 34%)
Ndjamena	54% (50%, 57%)
Overall	24% (20%, 27%)

Testing rates in Chad, by region and age group:

