Seasonal Malaria Chemoprevention (SMC) 2022 Campaign

Uganda

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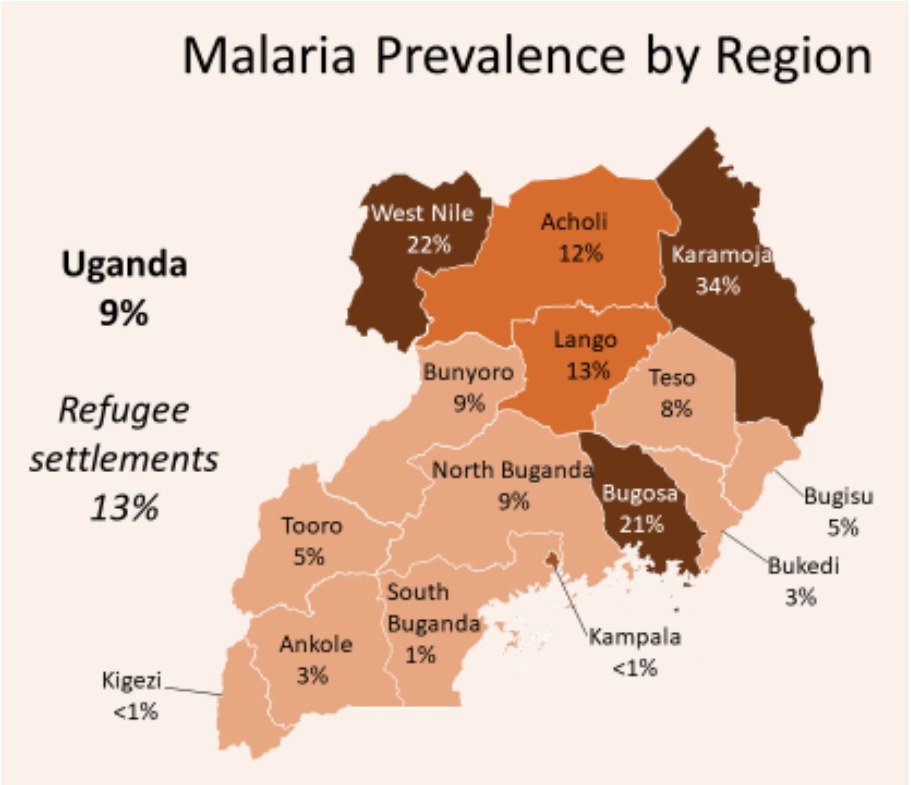
Prepared for the 2023 SMC Alliance Meeting - Conakry, Guinea

Summary information for 2022 and plans for 2023 campaigns

	2022	2023 Plans
Start and end dates	Start: May 2022, End: September 2022	Start: May 2023 End: September 2023
Number of cycles	5	5
Number of districts targeted	8	9 (1 additional district – Kaabong)
Number of children covered	209,405	257,581
Age ranges covered	3 – 59 months	3 – 59 months
Coverage (% targeted children receiving all cycles)	76.8%	Target: 90%
Any plans for campaign digitalization?	Digitalization of VHT supervision	Explore digitalisation of reporting/tally of beneficiaries
Any drug resistance testing or efficacy studies performed? (Y/N)	Y	Y

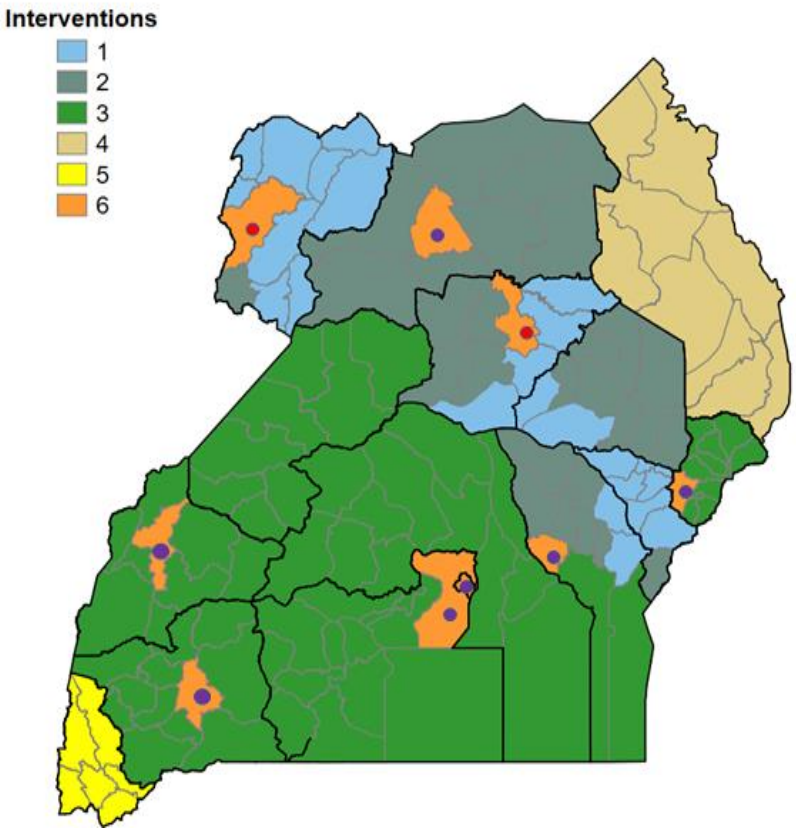
Background

- Malaria is major public health problem in Uganda, affecting almost 100 percent of the population.
- The Karamoja subregion consistently reports the highest prevalence rates; malaria transmission is seasonal.
- The Uganda Malaria Reduction and Elimination Strategic Plan 2021–2025 proposes seasonal malaria chemoprevention (SMC) to accelerate progress towards malaria elimination.
- Modelling by the Swiss Tropical and Public Health Institute suggests SMC could be a viable malaria prevention strategy in Karamoja.



Percent of children aged 0–59 months who tested positive for malaria by microscopy (UMIS 2019.)

Response to HBHI: Malaria stratification and intervention delivery approaches

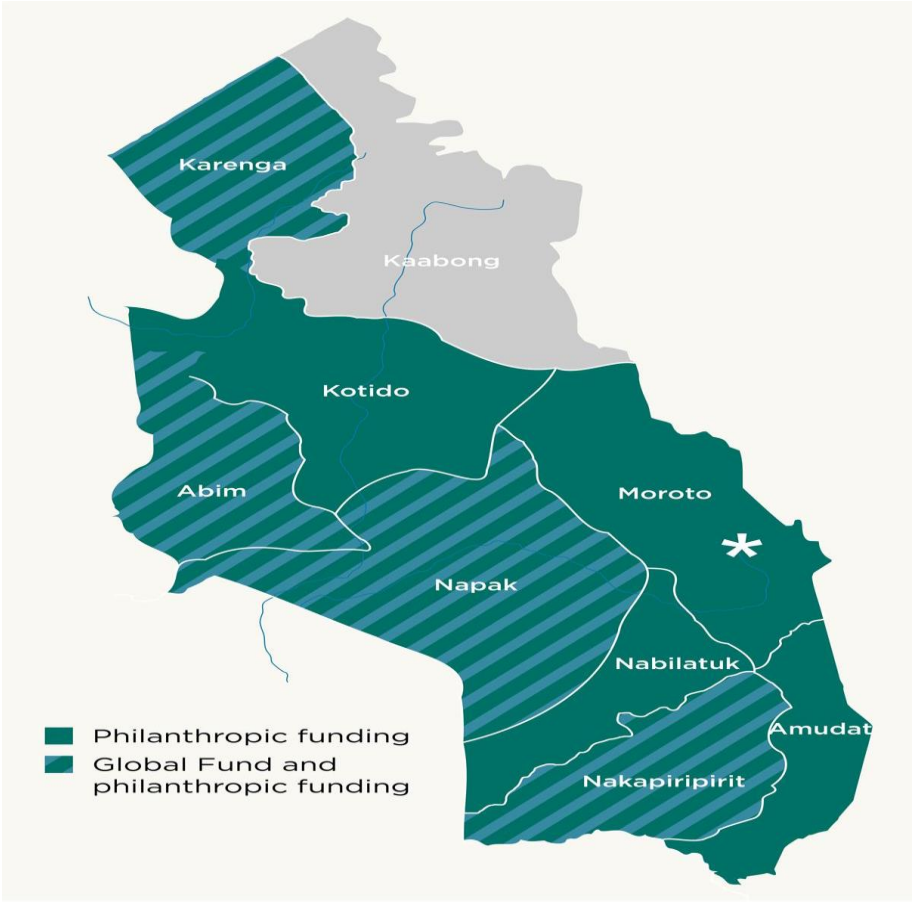


1	Indoor residual spraying (IRS), continuous long-lasting insecticidal net (LLIN) distribution, community health worker (CHW) outreach services
2	Campaign and continuous LLIN distribution
3	Campaign and continuous LLINs, intermittent preventive treatment (IPT) in infants (now perennial malaria chemoprevention) and IPT schools evaluations in selected districts
4	Campaign and continuous LLINs, CHWs with outreach services, mobile CHWs for nomadic pastoralist communities, SMC evaluation in selected districts
5	Campaign and continuous LLIN distribution, elimination surveillance
6	Urban areas: targeted mass and continuous LLINs followed detailed microstratification, larval source management, private sector integrated community case management and LLIN social marketing

Note: Standard case management and IPTp nationwide
City
Districts where rural areas will be covered with IRS

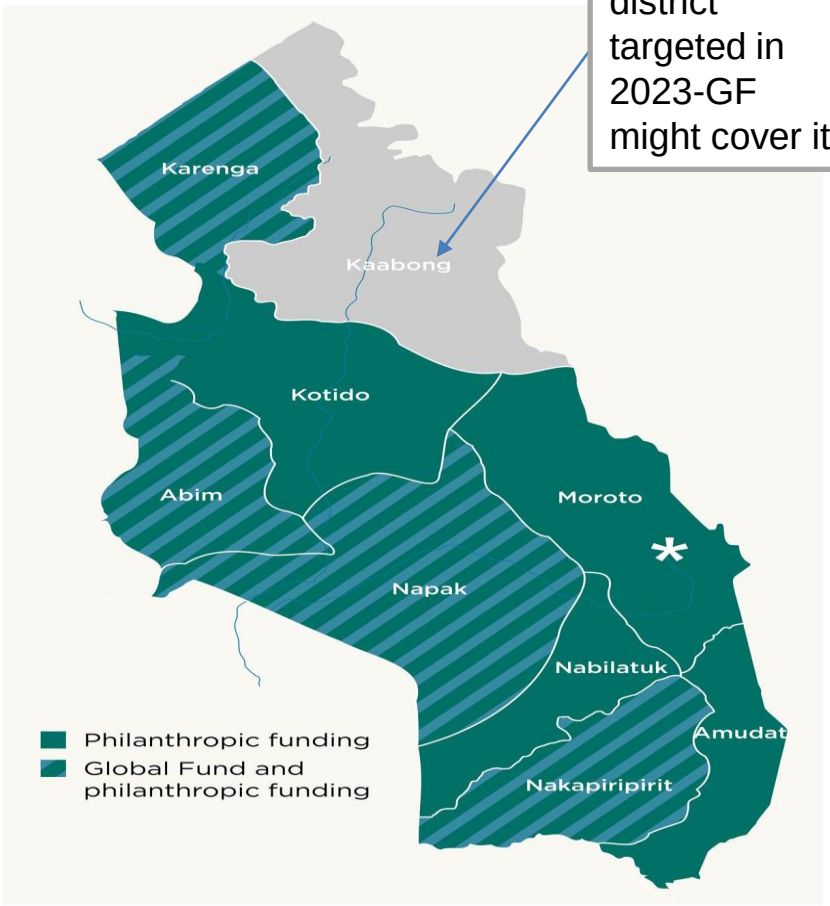
Country map showing SMC implementing districts

2022 map (covered)



2023 map

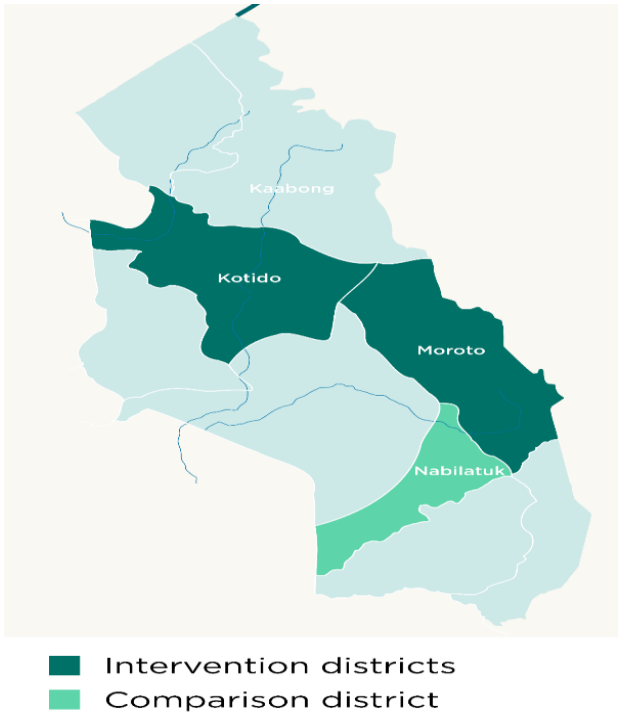
Additional district targeted in 2023-GF might cover it



Two phases of pilot stage

Phase I (2021)

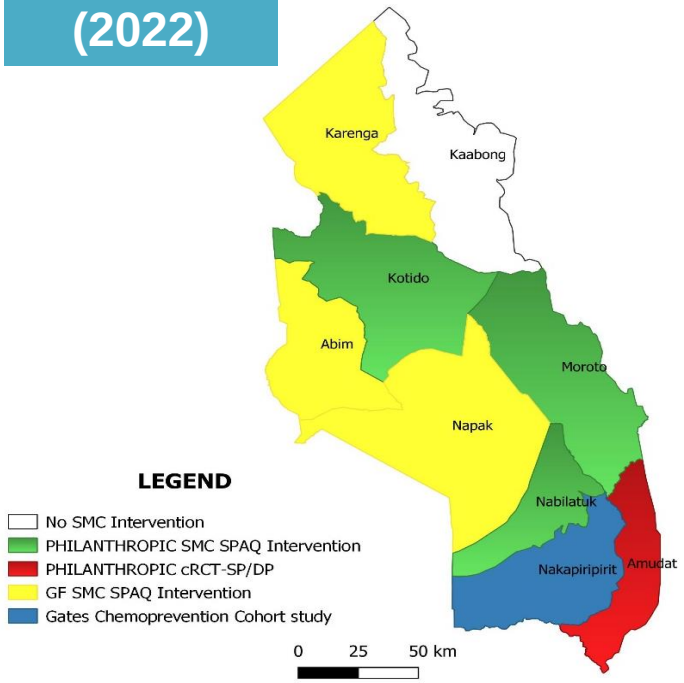
Target population 80,000



One donor: Philanthropic (GW)
Medicines: SPAQ
Effectiveness-implementation hybrid (EIH) type I

Phase II (2022)

Target popula on 250,00



3 donors: Philanthropic (GW), BMG, GF
Medicines: SPAQ
Effectiveness-implementation hybrid (EIH) type I

Study components of phases I and II

Study component	Phase I	Phase II
1. Administrative coverage and End-of-round household survey	Yes	Yes
2. Assessing the feasibility and acceptability of the adapted SMC implementation model	Yes	Yes (with Gender component)
3. Prospective cohort study	Non randomised control Trial	Cluster Randomised Control Trial
4. Resistance Marker study	Yes	Yes
5. Chemoprevention Efficacy study	No	Yes
6. Safety studies (DP)	No	Yes

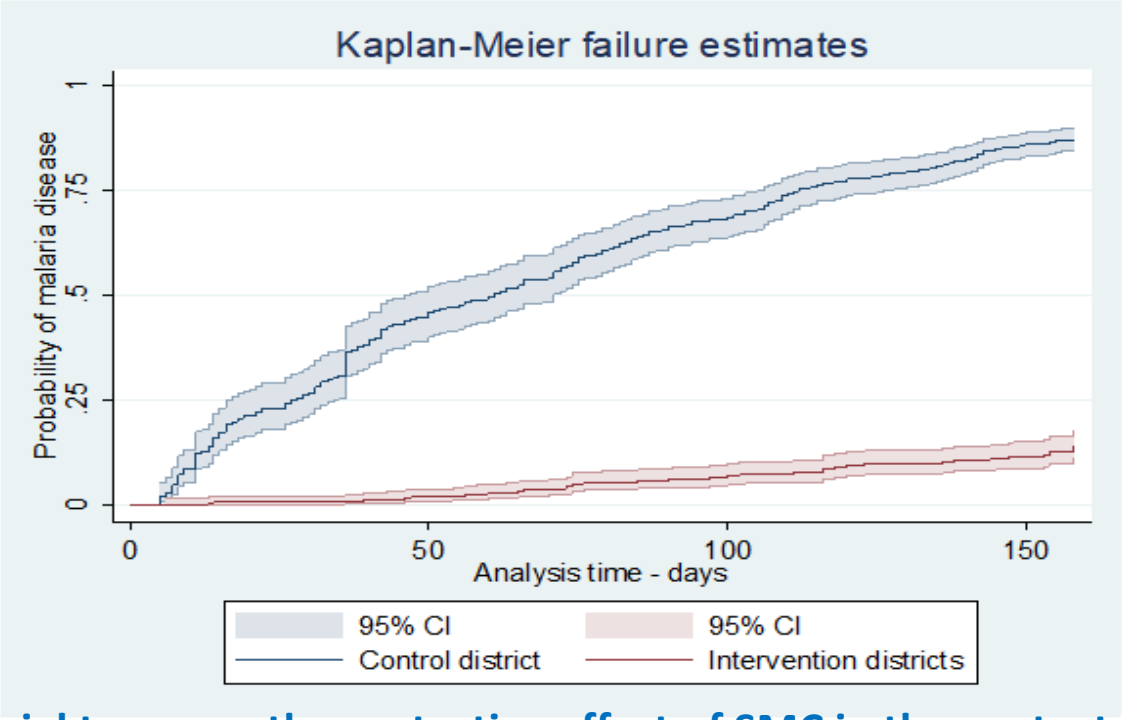
Summary of phase I study findings: nRCT

The malaria incidence rate was 3.0 and 38.8 per 100 person-months in the intervention and control groups, respectively.

Children in intervention districts had a 92.2 percent lower risk of developing confirmed malaria in the five-month follow-up versus those in the control district.

In the intervention areas, 90 percent of children never experienced a malaria episode, versus 15 percent in the control area; 85 percent of children in the control developed at least one episode and 60 percent had at least two over the follow-up period.

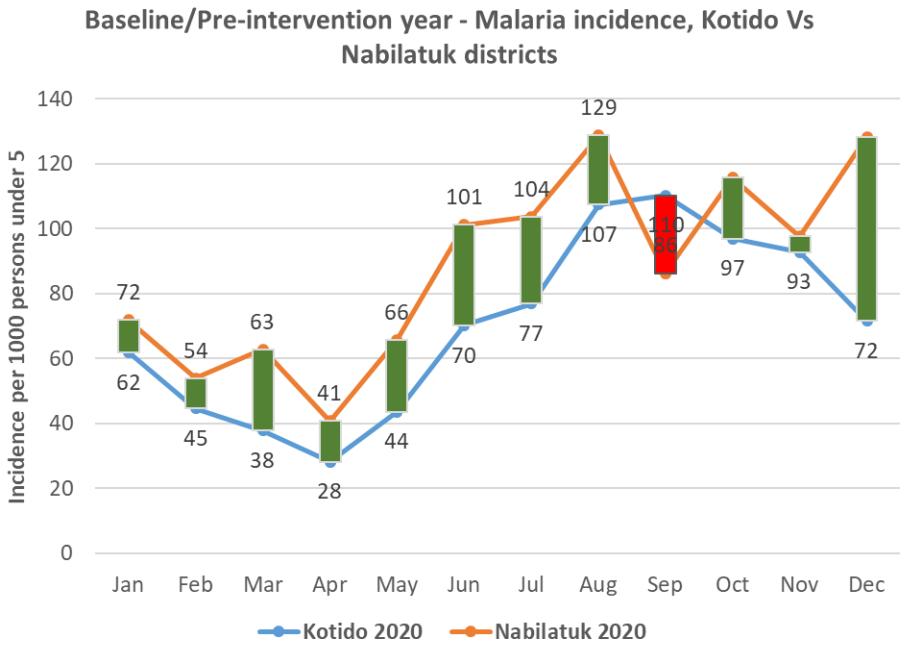
Study arm	Person time of observation (months)	Number of episodes	Incidence-rate per 100 person-months	Incidence rate ratio (95% CI)	P-value
Intervention	1982	60	3.0	0.078 (0.063–0.096)	<0.001
Control	997	387	38.8		

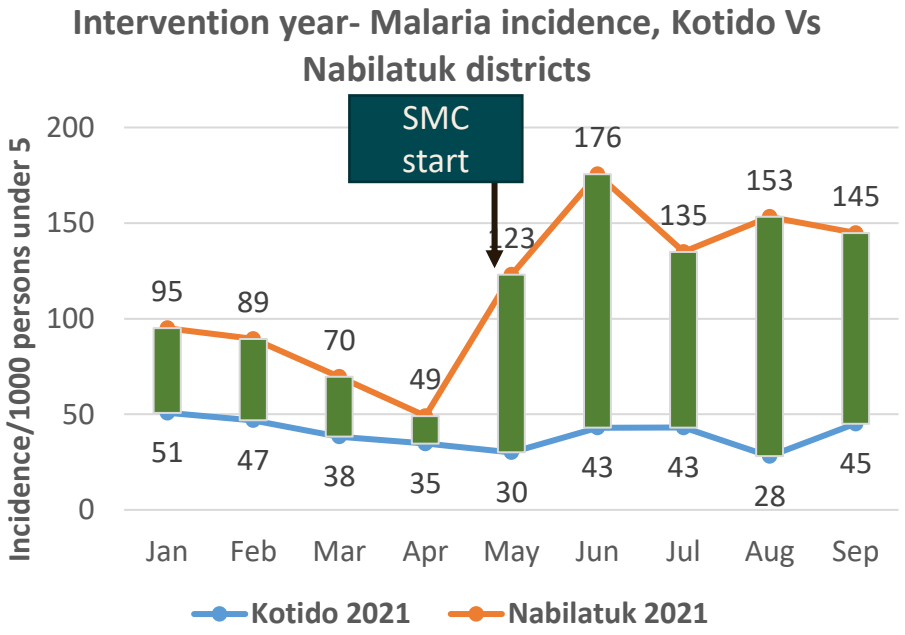


[A non-randomized controlled trial to assess the protective effect of SMC in the context of high parasite resistance in Uganda | Malaria Journal | Full Text (biomedcentral.com)]

Results Phase I: Routine data_DHIS2

Reduced malaria incidences in the intervention compared to control district before and after SMC implementation





Popn 2020 (children < 5 years)
Kotido: 58,958
Nabilatuk: 18,051

Popn 2021 (children < 5 years)
Kotido: 60,970
Nabilatuk: 18,667

Results Phase I: Resistance marker study

Prevalence of Antifolate and transporter mutations associated with SP and Amodiaquine resistance.

	Control group						Intervention group					
	Baseline			Endline			Baseline			Endline		
	Wild type	Mixed	Mutant	Wild type	mixed	Mutant	Wild type	Mixed	Mutant	Wild type	Mixed	Mutant
	n(%)	n(%)	n(%)	n(%)	n(%)	n(%)	n(%)	n(%)	n(%)	n(%)	n(%)	n(%)
PfDHFR N51I	1 (0.3)	2 (0.7)	227 (99)	7 (2.4)	3 (1)	271 (94.4)	0	0	248 (100)	4 (1.4)	20 (7.2)	254 (91.4)
PfDHFR C59R	39 (17)	21 (9)	176 (75)	14 (5)	15 (6)	233 (89)	63 (26.7)	10 (4.3)	163 (70)	12 (4)	14 (5)	241 (90)
PfDHFR I164L	261 (99)	3 (0.01)	0	271 (100)	0	0	288 (100)	0	0	277 (99.3)	2 (0.7)	0
PfDHFR S108T/N	0	7 (2.4)	281 (97.6)	4 (1.4)	24 (8.9)	241 (89.6)	0	7 (2)	283 (98)	0	18 (6)	262 (94)
PfDHPS A437G	7 (4)	35 (20)	137 (77)	1 (0.4)	21 (7.6)	253 (92)	5 (2)	64 (25)	182 (73)	2 (1)	16 (6)	255 (93)
PfDHPS A581G	219 (100)	0	0	266 (98.5)	3 (1.1)	1 (0.4)	252 (100)	0	0	280 (99.7)	1 (0.3)	0
PfDHPS A613S	203 (100)	0	0	275 (100)	0	0	236 (100)	0	0	277 (100)	0	0
PfDHPS K540E	0	1 (0.5)	203 (99.5)	1 (0.4)	19 (6.8)	258 (92.8)	3 (1.15)	3 (1.15)	255 (97.7)	2 (0.73)	6 (2.2)	266 (97.1)
PfMDR1 D1246Y	237 (99)	1 (0.4)	1 (0.4)	273 (99.6)	0	1 (0.4)	223 (99.1)	1 (0.4)	1 (0.4)	263 (97)	2 (0.7)	1 (0.4)
PfMDR1 N86Y	248 (94)	3 (1)	13 (5)	268 (97)	3 (1.2)	4 (1.8)	183 (84)	9 (0.4)	25 (12)	260 (99)	3 (0.1)	0
PfMDR1 Y184F	78 (29)	82 (0.3)	111 (41)	73 (27)	55 (20)	147 (53)	49 (22)	65 (29)	109 (49)	53 (19)	74 (27)	149 (54)
PfCRT K76T	205 (90.0)	2 (0.9)	20 (8.9)	253 (93.7)	5 (1.9)	12 (4.4)	206 (89.5)	2 (0.9)	22 (9.5)	253 (95.1)	7 (2.5)	9 (3.2)

Results Phase II: Cluster randomized control trial

Compared with children in the control arm, those in the SPAQ arm had a 94% lower risk of having an RDT-confirmed malaria episode; Hazard Ratio (HR): 0.06 (95% confidence interval [CI], 0.04 – 0.08, p<0.001); while those in the DP arm had a 96% lower risk; HR: 0.04 (95% CI, 0.03 – 0.06, p<0.001). The hazard ratio for the protective effectiveness of SPAQ was non-inferior to that of DP.

Study arm	Participants in the analysis	Person-days at risk	RDT-confirmed malaria episodes	Incidence rate per 10,000 person-days
All children	3,629	554,155	464	8
Control	384	53,672	322	60
DP	1,677	249,069	66	3
SPAQ	1,698	251,414	76	3

Results Phase II: Cluster randomized control trial

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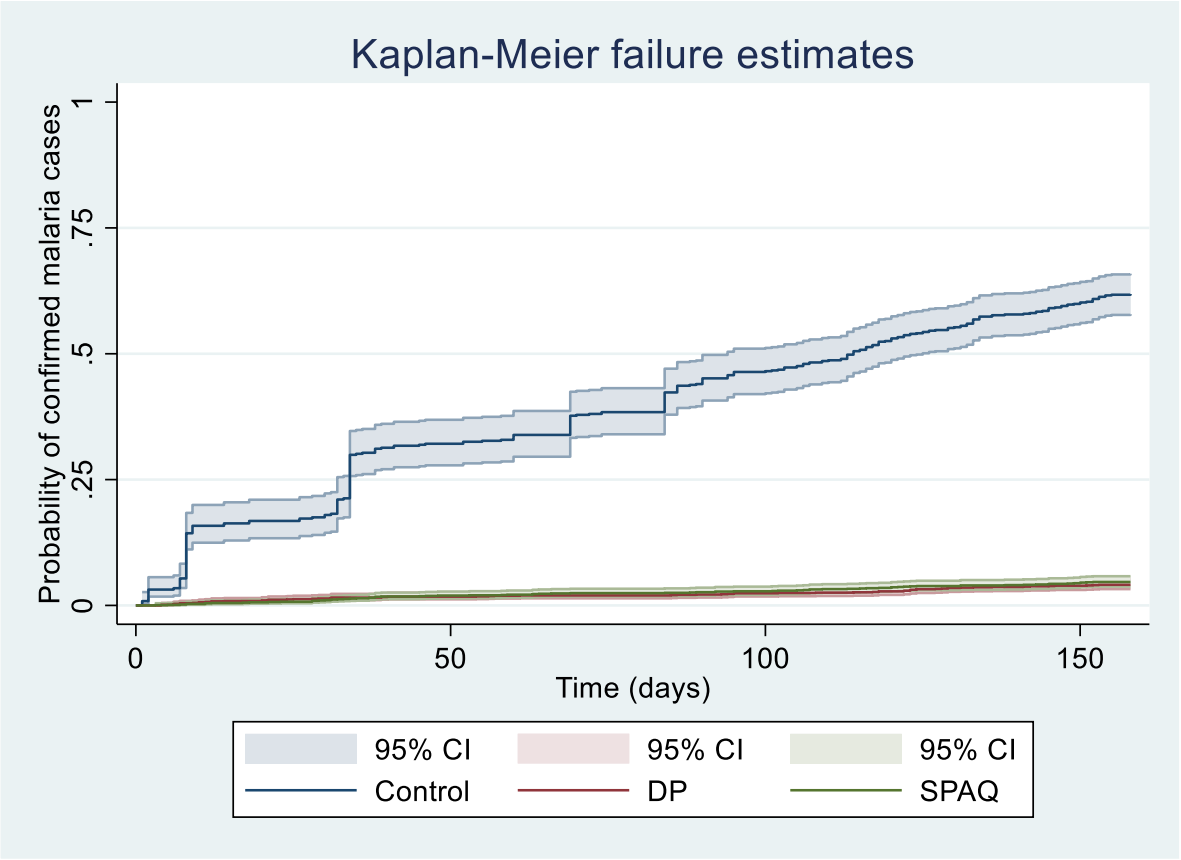
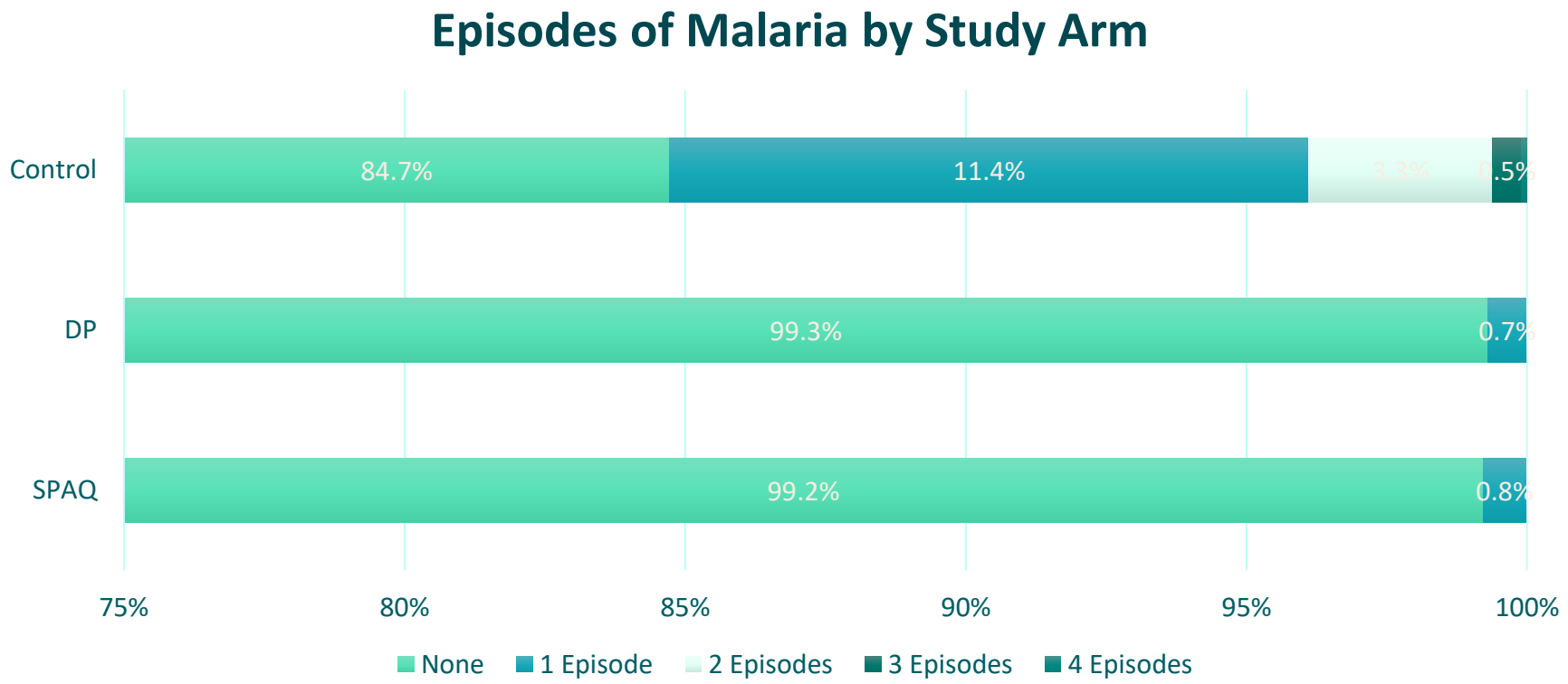


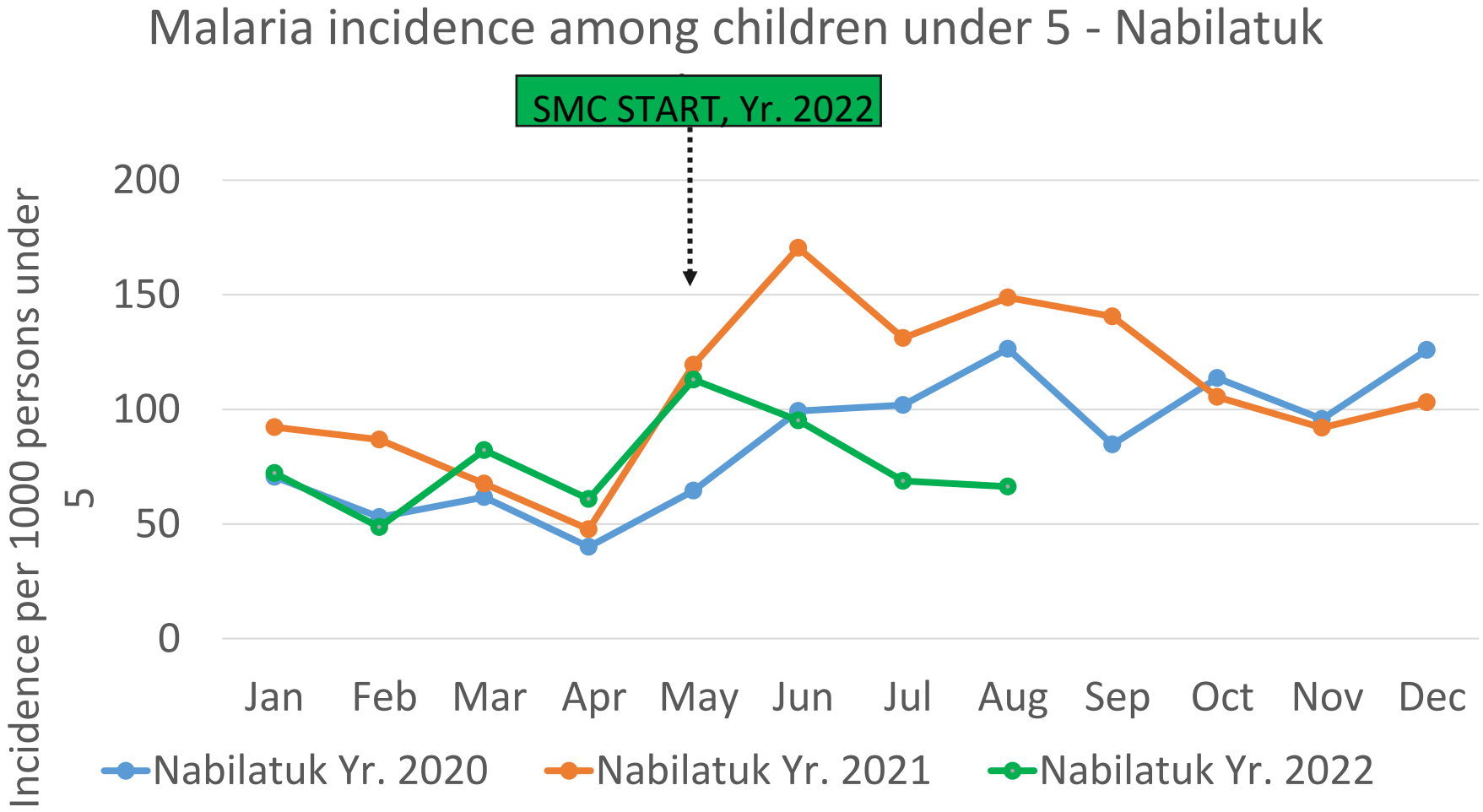
Results Phase II: Cluster randomized control trial

Malaria Episodes



Results Phase II: Routine data_DHIS2

NABILATUK DISTRICT



Conclusion

Conclusion and recommendations

SMC using is feasible and highly acceptable among the various stakeholders across different levels.

It conferred an excellent protective effectiveness against clinical malaria episodes during the peak malaria transmission season in Karamoja region, Uganda.

The cRCT results have demonstrated that DP is not superior to SPAQ in terms of prevention of clinically significant malaria in SMC-eligible children.

NOTE: We are yet to get the chemoprevention efficacy, safety and resistance markers results for phase 2 therefore we cannot, at this stage, comment on how well the drugs work in clearing existing infections, or how long they are likely to remain efficacious for

Next steps

- Scale out to all the 9 districts in Karamoja district
- Further data cleaning and analyses for the cRCT are ongoing, including more detailed descriptive analyses across cycles and analyses of secondary outcomes. Analyses are expected to be completed by March 2023
- Analyse the phase II resistance marker survey samples-June, 2023
- Analyse and disseminate the chemoprevention efficacy study results December 2023
- DP safety study among children 3-6 months results will be available by August 2023
- Analysis of qualitative data is ongoing, and results will be available by March 2023
- Study the impact of combining SMC with other interventions e.g MSAT, Malaria Vaccine and LLINs
- Study the impact of SMC in older children on overall malaria burden in Karamoja region

Thank you