

Cote d'Ivoire Phase I *Follow-Up 2* & Phase II *Follow-Up 1* Impact Survey 2017 Recommendations Report



1 Background

The Programme National de Lutte contre les Maladies Tropicales Négligées à Chimiothérapie Préventive (PNLMTN-CP) started their baseline data collection in 2013 involving 14 schools for *Schistosoma mansoni* and 15 schools for *Schistosoma haematobium* across 15 districts (Phase I). Subsequently the national programme expanded their monitoring programme involving an additional five schools *S. mansoni* and six for *S. haematobium* were included (Phase 2). This report reviews the Phase 1 (PI) Follow-Up 2 (FU2) and Phase 2 (P2) Follow-Up 1 (FU1), impact survey which was conducted in Cote d'Ivoire in October 2017. This is following 2 rounds (in P1 group) and 1 round (P2 group) of mass preventive chemotherapy (PC) for schistosomiasis (SCH). The subsequent PC campaign took place in November 2017.

The number of schools followed-up PI-FU2 $n=2$ and PII-FU1 $n=5$, is too small to determine whether results are nationally representative or of statistical significance, in evaluating programme impact and informing programmatic actions. A full analysis will be performed for FU1 and FU2 when all sentinel sites have been surveyed at these time points.

This report acts as a record of the survey process and informs how to improve future surveys. Preliminary results are also presented but must be interpreted with caution due to the number of schools sampled.

2 Methods

All methods described in associated protocol:

English Version: https://imperiallondon.sharepoint.com/:w:/r/sites/fom/schisto/mer/2_Country_M%26E/CIV/Impact/FY_1718/1_Protocol_%26_pre-survey/CIV_Impact_Survey_Protocol_2017_EN

2.1 Field methods

- For each school, 10% of slides were randomly selected for data quality control by a technician not involved in the first readings.
- To reach the necessary number of children at school EPP Kabolo (PI, Katiola district), pupils from EPP Timbe were recruited to reach the target sample size. For school EPP Nahobankaha (PI, Katiola district) pupils from EPP Lougbonou 1 were recruited to reach the target sample size. For school EPP Konan Moukro (PI, Sakassou district) pupils from EPP Kangre were also recruited to reach the target sample size.

2.2 Deviations from protocol

- Four schools (Kabolo, Nohobankule, Konan-Moukro, and Yoya-Goya) did not have enough pupils to reach 120 pupils per schools. Pupils from adjacent schools were included.

2.3 Ethical approval

Ethical approval was granted by the National Ethical Committee of Research as well as by Imperial College Research Committee ICREC_8_2_2. (https://imperiallondon.sharepoint.com/:b:/r/sites/fom/schisto/mer/2_Country_M%26E/CIV/Impact/FY_1718/1_Protocol_%26_pre-survey/CIV-Ethical%20approval%20Sentinel%20Sites)

3 Survey Recommendations

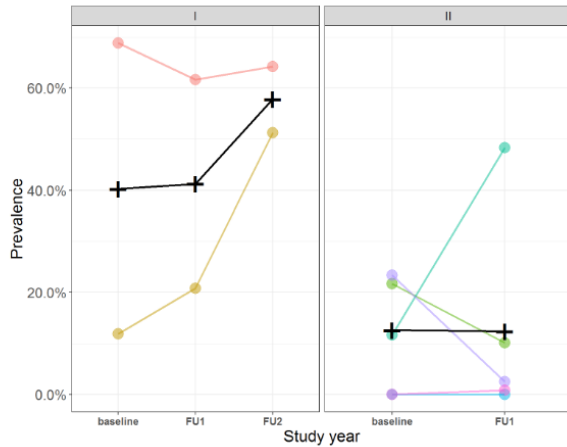
Table 2: Observations, interpretation and corrective measures for the survey process itself

Finding or observation	Interpretation	Corrective action
There was a discrepancy in reporting of microhaematuria and urine filtration results. Where urine filtration would show a decrease in prevalence of <i>S. haematobium</i> between follow up years, but prevalence by hemostix would increase.	As microhaematuria is not specific to <i>S. haematobium</i> , this would explain discrepancy between that and urine filtration. Furthermore, the reagent strips can be damaged due to the conditions they are kept in (i.e. open containers, humid conditions). The results are colour coded and therefore there is a risk of misinterpreting results.	PNLMTN to review condition of urine reagent strips during preparation for the next survey, specifically use by date, storage and if any prior damage. PNLMTN to ensure that interpretation of urine dipstick results is included in the training and that a hardcopy of the standard operating procedure (which includes colour codes) is provided to the technicians.
District names changed during survey phases.	Same school may be in different districts	PNLMTN to obtain list of administrative changes from Ministry of education (MoE). SCI to include corrective actions at questionnaire design. For example the site selection list to include both the old and new names of a district.

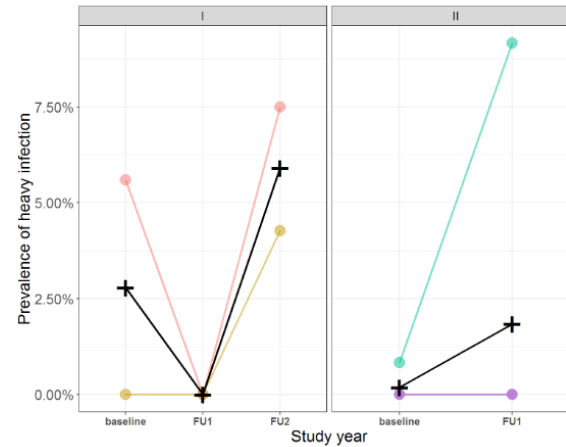
4 Results

4.1 Dashboard

S. mansoni prevalence by school (overall mean in black)



S. mansoni prevalence of heavy infection by school (overall mean in black)

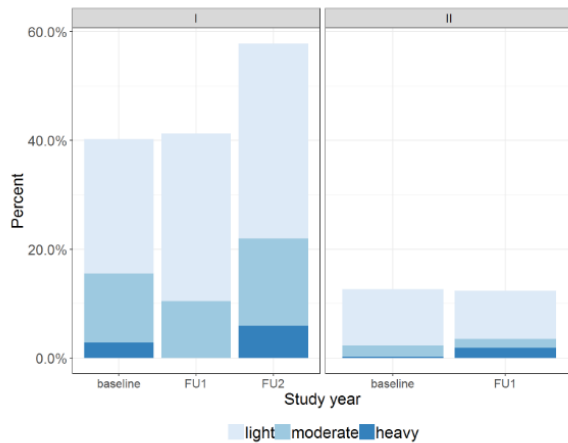


Comments

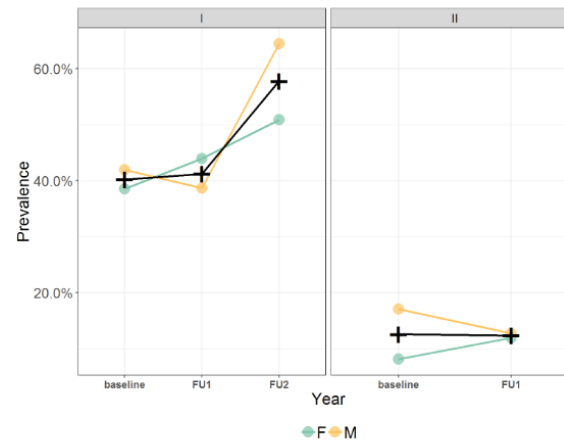
Phase	Study year	Schools	Number sampled	Number positive	Number heavily infected	Mean intensity of infection
I	baseline	2	251	101	7	52.8
	FU1	2	240	99	0	29.5
	FU2	2	237	137	14	104.4
II	baseline	5	540	68	1	9.0
	FU1	5	599	74	11	30.1

Phase I involved 14 schools to monitor *S. mansoni* from five health districts. Baseline data collection occurred in 2013. Subsequently the national programme expanded the treatment area. Phase II involved an additional seven *S. mansoni* schools in six health districts. Baseline data collection for phase II occurred in 2016. In 2017, two phase I *S. mansoni* schools were revisited and five phase II *S. mansoni* schools. Data for each phase are analysed and presented separately.

S. mansoni infection categories by school (overall mean in black)



S. mansoni prevalence by gender (overall mean in black)

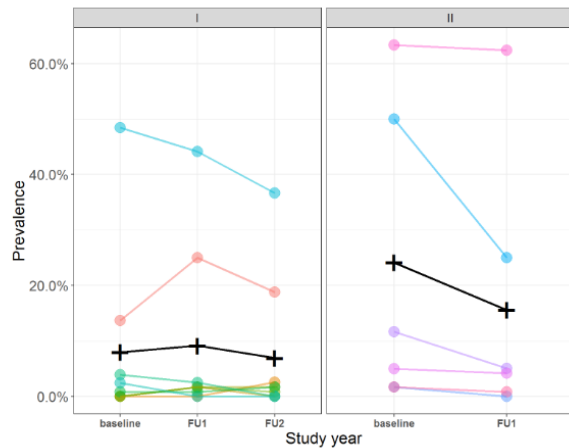


Comments

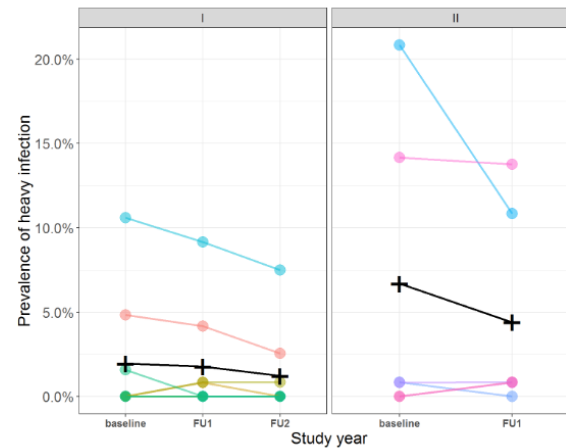
Phase I - For the two *S. mansoni* schools revisited in 2017 the prevalence increased from 40.2% to 57.8%, an increase of 17.6% points. This increase was statistically significant ($p < 0.001$). At FU2 the prevalence of *S. mansoni* for girls was 50.9% and for boys was 64.5%. This difference was statistically significant ($p = 0.038$).

Phase II - Five schools were surveyed from this phase. For one of the schools prevalence of *S. mansoni* increased from 11.7% to 48.3% and for another school increased from 0.0% to 0.8%. Overall the prevalence decreased from 12.6% to 12.4%. This decrease was not statistically significant ($p = 0.670$). At FU1 the prevalence for girls was 11.9% and for boys was 12.7%. This difference was not statistically significant ($p = 0.701$).

S. haematobium prevalence by school (overall mean in black)



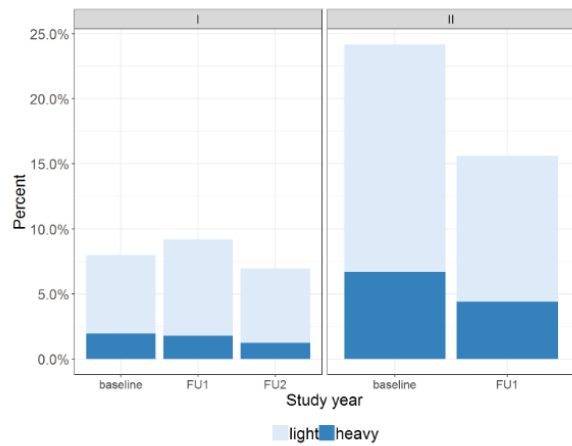
S. haematobium prevalence of heavy infection by school (overall mean in black)



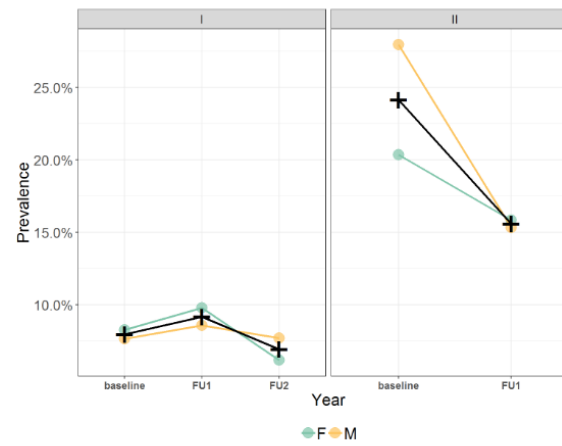
Comments

Phase	Study year	Schools	Number sampled	Number positive	Number heavily infected	Mean Intensity of infection
I	baseline	9	1129	90	22	5.393268
	FU1	9	1014	93	18	3.420180
	FU2	9	1068	74	13	2.099334
II	baseline	6	658	159	44	16.541892
	FU1	6	705	110	31	13.102774

S. haematobium infection categories by school (overall mean in black)



S. haematobium prevalence by gender (overall mean in black)



Comments

Phase I - at baseline, 15 schools were selected to monitor *S. haematobium*. During the 2017 survey, nine of these schools were followed up. Prevalence of *S. haematobium* reduced from 8.0% to 6.9% however this reduction was not statistically significant ($p = 0.156$). Prevalence for girls was 6.2% and for boys was 7.7% however this difference was not statistically significant ($p = 0.195$). The prevalence of heavy infection went from 1.9% at baseline to 1.2% at FU2. This reduction was not statistically significant ($p = 0.202$).

Phase II - six schools were followed up for phase II in 2017. In these schools the prevalence of *S. haematobium* reduced from 42.2% to 15.6% ($p < 0.001$). The prevalence for girls and boys was 4.0% and 4.8% respectively. This difference was not statistically significant ($p = 0.638$).

4.2 Results tables

Table 3. Impact survey results.

Infection	Characteristics			Prevalence				Prevalence of heavy infections				Mean Intensity (epg / ep10ml)		
	Year	No. Schools	No. Pupils	Prevalence	Prevalence percentiles† across all schools	% reduction from baseline	P-value of difference from baseline	Prevalence of heavy infections	Prevalence of heavy infections percentiles† across all schools	% reduction from baseline	P-value of difference from baseline	Mean Intensity (epg / ep10ml)	Mean intensity percentiles† across all schools	% reduction from baseline
Phase I <i>S. mansoni</i>	baseline	2	251	40.24%	26.1%	n/a	n/a	2.79%	1.4%	n/a	n/a	52.8	29.0	n/a
					40.4%				2.8%				53.0	
					54.6%				4.2%				77.1	
	FU1	2	240	41.25%	31.0%	n/a	n/a	0.00%	0.0%	n/a	n/a	29.5	20.6	n/a
					41.3%				0.0%				29.5	
					51.5%				0.0%				38.4	
	FU2	2	240	57.81%	54.5%	-43.7%	<0.001	5.91%	5.1%	-111.8%	0.084	104.4	91.8	-97.6%
					57.7%				5.9%				104.1	
					61.0%				6.7%				116.5	
Phase I <i>S. haematobium</i>	baseline	9	1138	7.97%	0.0%	n/a	n/a	1.95%	0.0%	n/a	n/a	5.4	0.0	n/a
					0.8%				0.0%				0.0	
					3.9%				1.6%				8.9	
	FU1	9	1020	9.17%	0.8%	n/a	n/a	1.78%	0.0%	n/a	n/a	3.4	0.0	n/a
					1.7%				0.0%				0.3	
					2.5%				0.9%				0.9	
	FU2	9	1080	6.93%	0.0%	13.0%	0.156	1.22%	0.0%	37.4%	0.202	2.1	0.0	61.2%
					1.7%				0.0%				0.2	
					2.5%				0.8%				1.7	
Phase II <i>S. mansoni</i>	baseline	5	540	12.59%	0.0%	n/a	n/a	0.19%	0.0%	n/a	n/a	9.0	0.0	n/a
					11.7%				0.0%				11.4	
					21.7%				0.0%				14.5	
	FU1	5	600	12.35%	0.8%	-78.2%	0.700	1.84%	0.0%	-51%	0.018	30.1	0.1	-1338.3%
					2.5%				0.0%				0.9	
10.1%	0.0%	1.9												
Phase II <i>S. haematobium</i>	baseline	6	660	24.16%	2.5%	n/a	n/a	6.69%	0.2%	n/a	n/a	16.5	0.3	n/a
					8.3%				0.8%				1.5	
					40.4%				10.8%				20.3	
	FU1	6	706	15.60%	1.7%	-26.3%	<0.001	4.40%	0.8%	-139%	0.137	13.1	1.0	56.4%
					4.6%				0.8%				4.3	
20.0%	8.3%	14.4												

Table 4. Impact survey results by sex

Infection	Year	No. Schools	No. Girls	No. Boys	Prevalence	Prevalence	Prevalence of heavy infections	Prevalence of heavy infections	Mean Intensity (epg / ep10ml)	Mean Intensity (epg / ep10ml)
					Girls	Boys	Girls	Boys	Girls	Boys
Phase I <i>S. mansoni</i>	baseline	2	127	124	38.58%	41.94%	3.94%	1.61%	62.1	43.3
	FU1	2	116	124	43.97%	38.71%	0.00%	0.00%	33.1	26.2
	FU2	2	118	122	50.86%	64.46%	6.90%	4.96%	115.7	93.7
Phase 1 <i>S. haematobium</i>	baseline	9	587	551	8.28%	7.65%	2.24%	1.64%	5.5	5.3
	FU1	9	506	514	9.78%	8.58%	1.80%	1.75%	3.6	3.3
	FU2	9	541	539	6.17%	7.69%	1.12%	1.31%	1.8	2.4
Phase II <i>S. mansoni</i>	baseline	5	271	269	8.12%	17.10%	0.00%	0.37%	2.8	15.2
	FU1	5	294	306	11.95%	12.75%	1.02%	2.61%	13.8	45.6
Phase II <i>S. haematobium</i>	baseline	6	330	330	20.36%	27.96%	5.78%	7.60%	15.7	17.4
	FU1	6	354	352	15.86%	15.34%	3.97%	4.83%	18.6	7.5

4.3 Pdf of dashboard



CIV_2017_Impact_d
ashboard_2019-03-2