



Post MDA Coverage Survey Report

GiveWell

Guinea Bissau

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1. Background

In Guinea Bissau, the GiveWell Deworming Project is being implemented in Farim, Oio, Cacheu, Bafata, Gabu, Biombo and Tombali health regions. The project provides support for deworming of school-age children for schistosomiasis (SCH) and soil-transmitted helminths (STH). The distribution strategy follows WHO recommended guidelines for mass drug administration (MDA). Praziquantel and albendazole are provided to all people aged 5 years to 14 years in schools and in the communities for those that are not enrolled.

The project aims to lower the prevalence and intensity of SCH/STH infection by targeting at school-age children through MDA with praziquantel for SCH and albendazole for STH.

Between December 2018 and April 2019, the second consecutive round of SCH/STH treatments were delivered in Guinea Bissau following WHO treatment cycle, which is predicated on regional prevalence. Praziquantel was administered by measuring an individual's height against a calibrated stick with dosage ranging from one to four tablets of praziquantel and one tablet of albendazole.

Praziquantel/albendazole was primarily provided to enrolled kids in schools and to non-enrolled school aged children at focal points in the community. Treatment with both drugs was documented in treatment records and tallied at health centers for central reporting through the regional health teams of the intervention regions.

Although MDA was delivered in endemic regions, because of prolonged strikes within the civil service which lasted for months, Oio was the only region eligible for TCS. The chances of recall bias were perceived high in regions that had undergone MDA between December 2018 and February 2019. Oio MDA was delivered in April and TCS conducted between May and June 2019.

Table 1: Distribution of SCH/STH treatments by Region.

Region	SCH	STH
Bafata		
Bijagos		X
Biombo		X
Bolama	X	
Cacheu		
Farim	X	

Gabu		
Oio	X	
Quinara		X
SAB		
Tombali	X	X

Table 2: Reported coverage.

Region	Total Population	Estimated Population 5-14 yrs	Total Treated - SCH	SCH Coverage
Oio	207,596	55,583	51865	93.31%

2. Aims and objectives of survey

Aim

To validate reported coverages of the 2018 MDA campaign held from December 2018 to April 2019 for schistosomiasis.

Objectives

- To assess the reliability of the reporting system for school-based and community-based school-age treatments for determining the target population size;
- To identify reasons for non-participation (or non-treatment) by drug distributed, sex, age, wealth status and geographic location/region;
- To determine if there were any differences in being offered drugs and swallowing by sex, age and enrollment status;
- To identify methods for awareness raising during MDA in communities and schools;
- To inform whether CDDs visited the communities surveyed.

3. Methodology

3.1 Timing of survey

The survey was conducted between May 24th and June 2nd, 2019 starting with a three-day training followed by field data collection. Data collection took place for 10 days.

A briefing with staff from the National NTD team and members of the regional health team of Oio was held in Bissau on May 20th, 2019. As this survey is routine and been conducted before, the national NTDs team of the Ministry of Health is expected to be familiar with the protocol and survey methodology.

To mitigate recall bias, errors related to drug distribution; the survey team ensured the following:

- Drug samples (and the packaging of the drugs) of the different drugs distributed were shown to each participant when discussing;
- Major events in the communities' history was used to discuss the time frames of when the MDA was conducted.

3.2 Study area

The survey was conducted in Oio region.

3.3 Survey methodology

As mentioned above, contrary to Sightsavers preferred approach to randomly select health districts during coverage surveys, Oio was purposefully selected due to operational challenges, which were partly due to prolonged strikes within the civils service and Sightsavers' desire to mitigate recall bias.

A cross-sectional population-based survey was conducted in order to determine the proportion of individuals reporting taking praziquantel during the most recent round of MDA and the determinants of being offered and swallowing the medication.

The survey methodology was based on WHO recommended guidelines. In the selected region of Oio, the survey followed a two-stage cluster sampling methodology, with the primary sampling unit (PSU), being the community/village and the secondary cluster, the household. The head of every household randomly selected was explained the purpose and procedure of the survey and, if they agreed to proceed, they provided verbal consent for their household to participate. A questionnaire was administered to everyone in the household (permanently resident), asking their age, sex, status of school enrolment (for children), whether they participated in the MDA, if they swallowed the drugs and if not, reasons were provided.

The person responding to each question was recorded. When a person was not available or very sick and could not answer questions, another household member or caregiver was able to provide answers on their behalf. Primary caregivers assisted children aged 5-10 years old to provide responses, but children were encouraged to respond directly. Sample tablets of the drugs and the packages used during the recent MDA were shown to the household member to assist their recall.

In selected households, only school-aged children were asked whether they took schistosomiasis treatment.

The questionnaire was administered in either Portuguese or appropriate local language to enhance understanding.

3.4 Sampling

3.4.1 Sample size

The survey was powered to determine coverage at the region for the target group of 5 – 14 years. The sample size was determined using the [WHO Coverage Survey Builder, version 2.5](#). Details regarding the sampling and selection methodology are available in the WHO manual.

The following parameters were used in the survey builder:

- 2018 inflated population based
- Estimated coverage of 50%
- Precision of +/- 5%
- 95% confidence level or z score of 1.96
- Design effect¹ of 4
- Non-response of 15%
- Average household size of 2.5 for number of 5-14 yrs expected

A minimum of **1,808 individuals** had to be sampled. These were to be divided across **30 clusters (communities)**. In each cluster, **25** households were sampled according to the disease specific sampling interval of **every 2nd household**. Households were selected after community segmentation according to a random, pre-defined list.

3.4.2 Sensitization of the Clusters

The survey coordinator who is the national coordinator of the SCH/STH Programme of the MoH was in charge of making sure that the leaders of each cluster selected for the coverage

¹ The design effect takes into account sampling variance introduced by using a cluster sampling methodology rather than a simple random sampling method. It adjusts the sample size based on the correlations within clusters (i.e. similarities found between households in the village/EA)

survey were aware of the survey in advance of the team's visit. During this sensitization visit (or phone call) with the local leaders, the representative from the survey team explained the purpose of the coverage survey and also discussed the optimal day of the week and time of day for the survey team to visit in order to find members of the survey population at home.

3.4.3 Dividing the Community into the Number of Segments

As teams arrived in the selected villages, they identified local guides who helped them draw a sketch map of the village . This included; major outer boundaries, places of interest, e.g. schools, shops and internal boundaries, e.g. paths or roads. The teams then divided the selected community into the pre-determined number of segments on the sample frame, which is 50 households each.

Each segment was numbered and each number written onto a piece of paper and someone from the village was asked to randomly pick one number. That was the segment that was surveyed. Starting with the initial household, the team enumerated households as they followed a predetermined route through the segment (ignoring any structures that are not households).

3.4.4 Selecting the households

In the selected segment, for each enumerated household that corresponded to a number on the selected list, the team stopped and interviewed all members of the survey population who were living in the household at the time of the MDA.

3.5 Survey team composition

The study team was selected from individuals who were not part of the MDA campaign. Two teams were constituted, with each having four surveyors working in pairs, each with one phone. Local guides were hired to assist in finding villages and work with village leaders to conduct segmentation. Two (2) team supervisors – 1 male and 1 female were selected from the pool of surveyors and were assigned to each health area team. The team supervisors were selected based on their leadership skills.

3.6 Data Recording

A questionnaire form was completed for each household selected and administered on Android phones using the CommCare survey platform. The platform was automatically uploaded into the CommCare system. The data downloaded by Sightsavers, cleaned and analyzed.

3.7 Data Analysis

Data were cleaned and analyzed using Stata 14.0 MP (StataCorp, College Station, TX). Estimates were adjusted for the number of clusters to account for the survey methodology. No weights were provided as the sample selection was considered self-weighting. Analysis was done to determine the coverage (program and geographic) for the MDA campaign and reported results from treatment registers or health system records compared with surveyed. 95% Confidence Intervals (CI) was calculated for the treatment coverage.

3.8 Ethical approval & consent

Permission for the survey was obtained from relevant authorities. It was not expected that ethical approval was required as this survey was part of the routine monitoring of the program activity, with no harm to the individual taking part in the study. Verbal consent was obtained from every household head before commencing the interview. All information collected was anonymous and confidential. All electronic data was protected by a password.

4. Training

Team members were trained on; the rationale of the coverage survey, methodology, filling of questionnaire using mobile phones, quality control of the survey and ethics/guidelines of conducting community surveys.

5. Results

a. Surveyed respondents

A total of 1,752 eligible individuals aged 5-14 years were sampled from 752 households during the survey.

Table 3: Surveyed households and individuals by health area

Health Zone	Total Villages Surveyed	Total Households Visited	Households with SAC	No	Refused	Eligible Population (5-14 yrs)
Binar	2	50	9		1	129
Bissora	7	176	29		0	511
Encheia	2	50	4		0	96
Gamamudo	1	25	12		0	21
Mansaba	4	100	26		0	216
Mansoa	6	150	31		0	332
Mores	1	23	3		0	41
Nhacra	4	100	24		0	214
Olossato	2	53	6		0	133
Portogole	1	25	6		0	59
Total	30	752	150		1	1,752

Figure 1 below presents sex distribution per health area. Males were more likely to be surveyed than females and the difference was statistically significant ($P = 0.0010$).

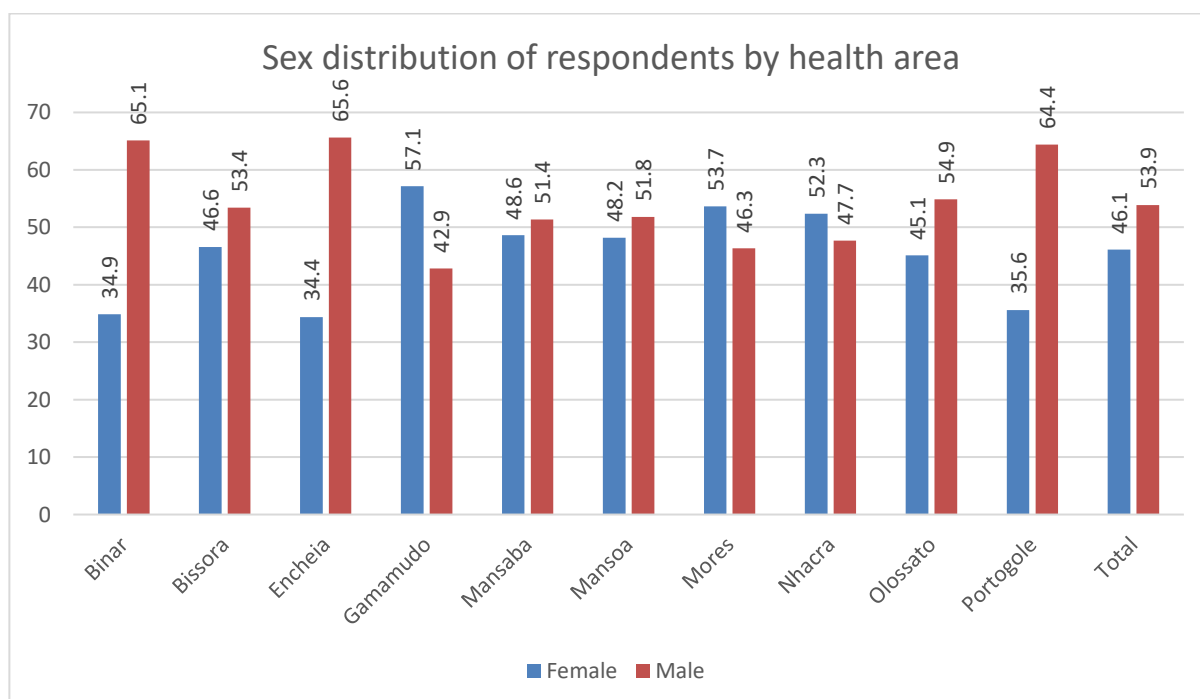


Figure 1: Sex distribution of survey respondents (Binar, n=129; Bissora, n=511; Encheia, n=96; Gamamudo, n=21; Mansaba, n=216; Mores, n=41; Nhacra, n=214; Olossato, n=133; Portogole, n=59).

The disaggregation of survey respondents by age per health area is shown below (figure 2).

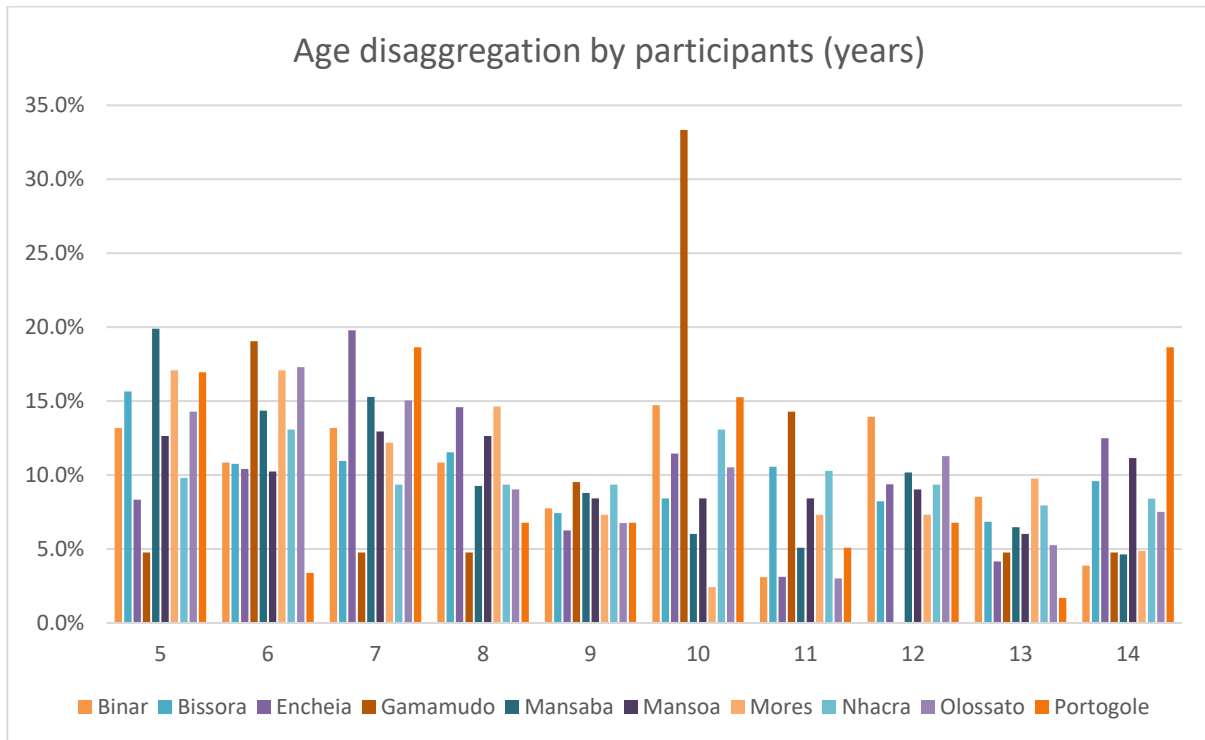


Figure 2: Age disaggregation of Survey respondents by health area.

Most of the survey respondents were enrolled SAC. School enrollment was highest in Nhacra (85.5%) and Mores (85.4%), and least in Encheia (45.8%) as shown below:

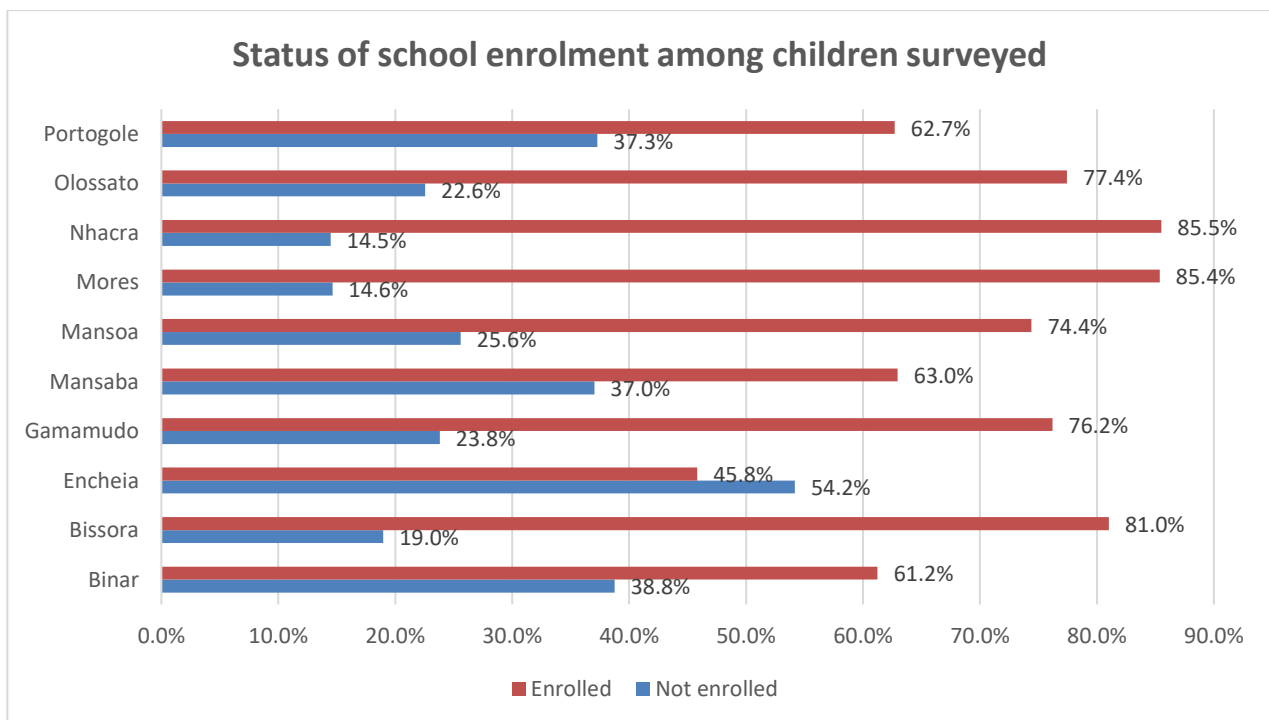


Figure 3: Distribution of school enrolment status by health area.

Except for Mansaba where both sexes had equal enrolment chances, males were more likely to be enrolled than females. See fig 4 below.

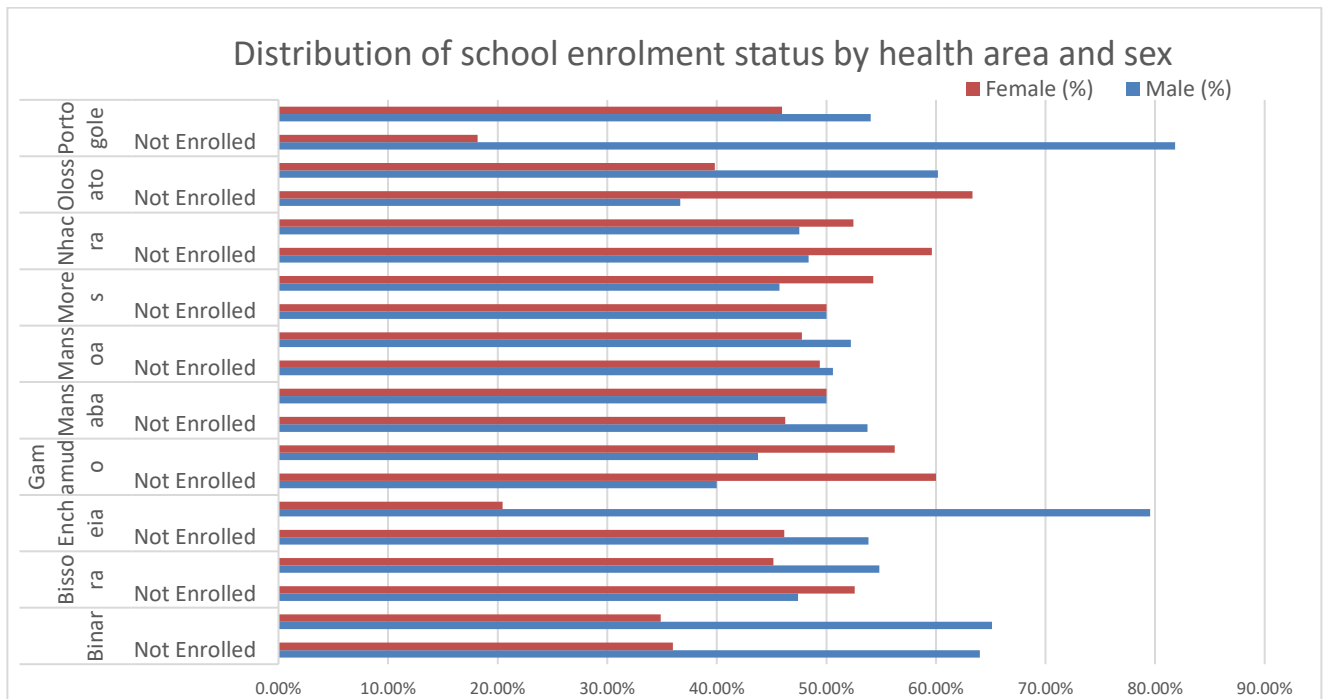


Figure 4: School enrolment by sex per health area.

Self-reporting was least observed in all ten health areas. Most proxy responses came from parents or guardians. See figure 5.

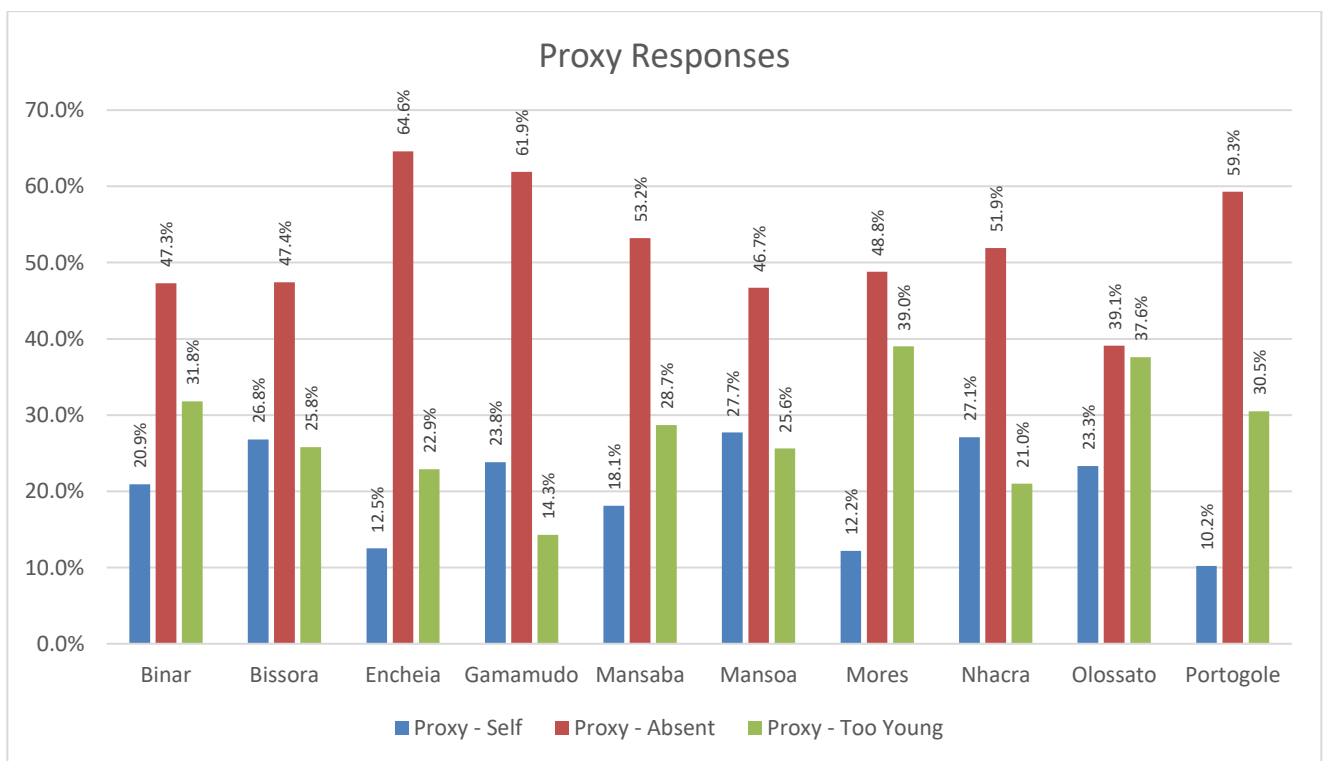


Fig 5: Proxy status of survey respondents

B) Survey Coverage

The table below shows treatment for SCH provided by region and health area. 97.95% of SAC were reported treated in Oio region (table 4). At health area level, the proportion of SAC reported being treated with praziquantel (PZQ) was highest in Encheia (100%), Mores (100%) and Portugole (100%), and least in Gamamudo (80.95%). When considering the 95% confidence interval, Nhacra and Olossato had lower bounds below 75% with all upper bounds exceeding 75% (table 5).

Table 4: Surveyed coverage by Region

SCH	Oio
	% (95% CI)
PZQ	97.95 (96.74,98.71)
Not Treated	2.05 (1.29, 5.32)
n	1752

**adjusted for number of enumeration units and surveyed households*

Table 5: Surveyed coverage per health area.

SCH	Binar	Bissora	Encheia	Gamamudo	Mansaba
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
PZQ	98.45 (77.72, 99.91)	97.65 (93.89, 99.12)	100	80.95 (78.57, 82.51)	98.15 (87.87, 99.74)
Not Treated	1.55 (.0865, 22.28)	2.35 (0.88, 6.11)	0	19.05 (12.78, 27.54)	1.85 (0.26, 12.13)
n	129	511	96	21	216

**adjusted for number of enumeration units and surveyed households*

SCH	Mansoa	Mores	Nhacra	Olossato	Portugole
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
PZQ	98.49 (95.44, 99.51)	100	97.20 (73.51, 99.77)	97.74 (53.61, 100)	100
Not Treated	1.51 (0.49, 4.56)	0	2.80 (0.23, 26.49)	2.26 (0.00029, 99.46)	0
n	332	41	214	133	59

**adjusted for number of enumeration units and surveyed households*

Figure 6 presents the MDA platforms used during the campaign. Most treatments were delivered at home than in school.

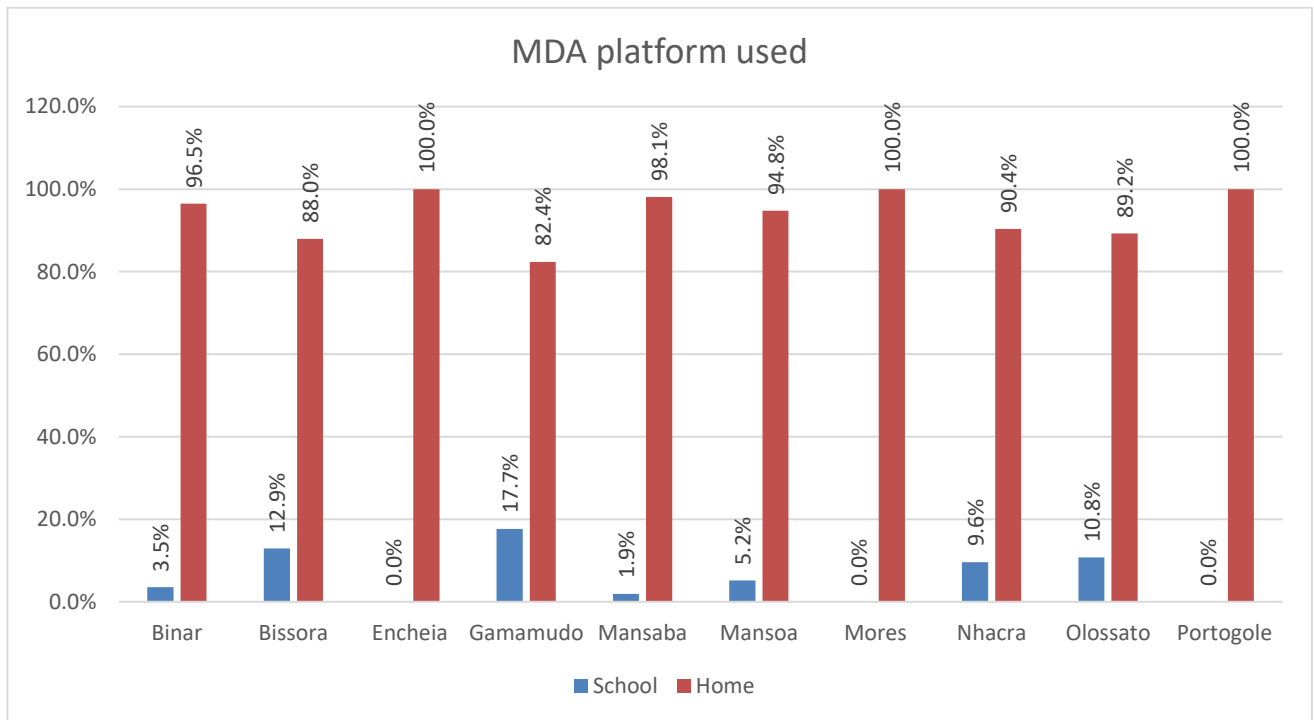


Fig 6: MDA Platform Used.

Most treatments were delivered to enrolled kids in all health areas sampled. The difference between treatment delivered to enrolled and non-enrolled SAC was not statistically significant ($P = 0.348$) as seen in figure 7. Most kids treated were enrolled except for Encheia health area with a 54.2% treatment of non-enrolled SAC.

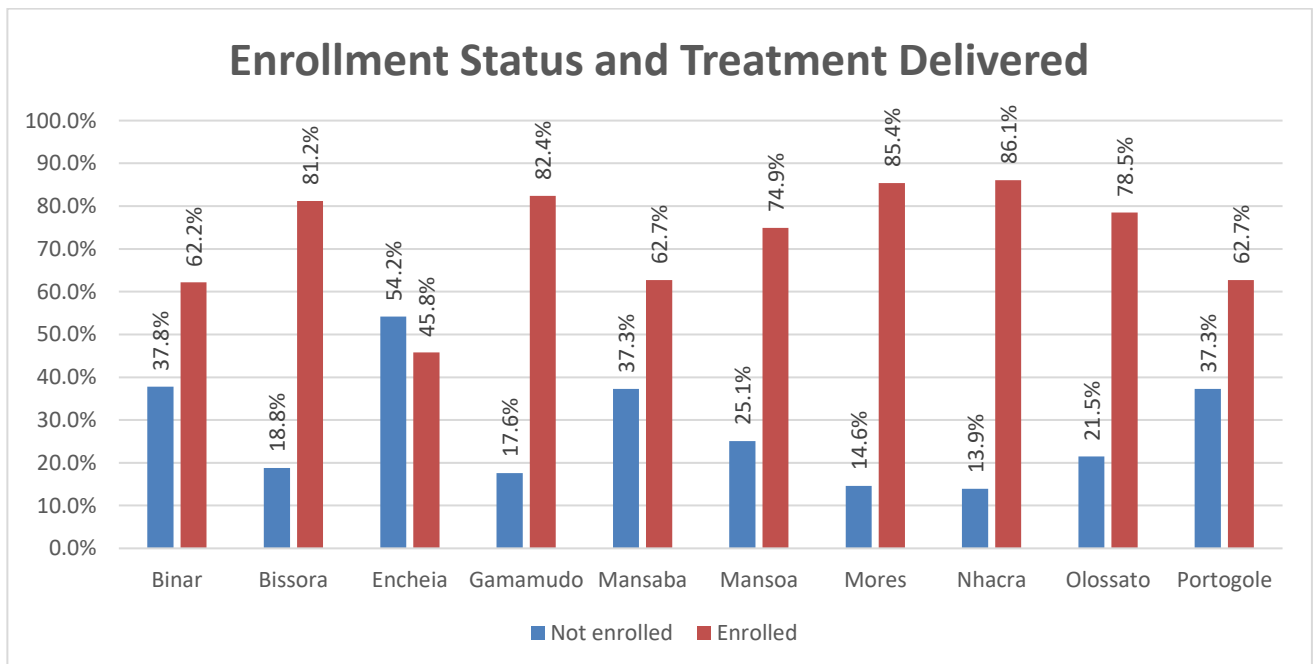


Fig 7: Enrolment status and treatment delivered by health area

Find below treatment delivered by sex for each health area. Most often, males were more likely to be treated than females, though the difference was not statistically significant ($P = 0.7802$).

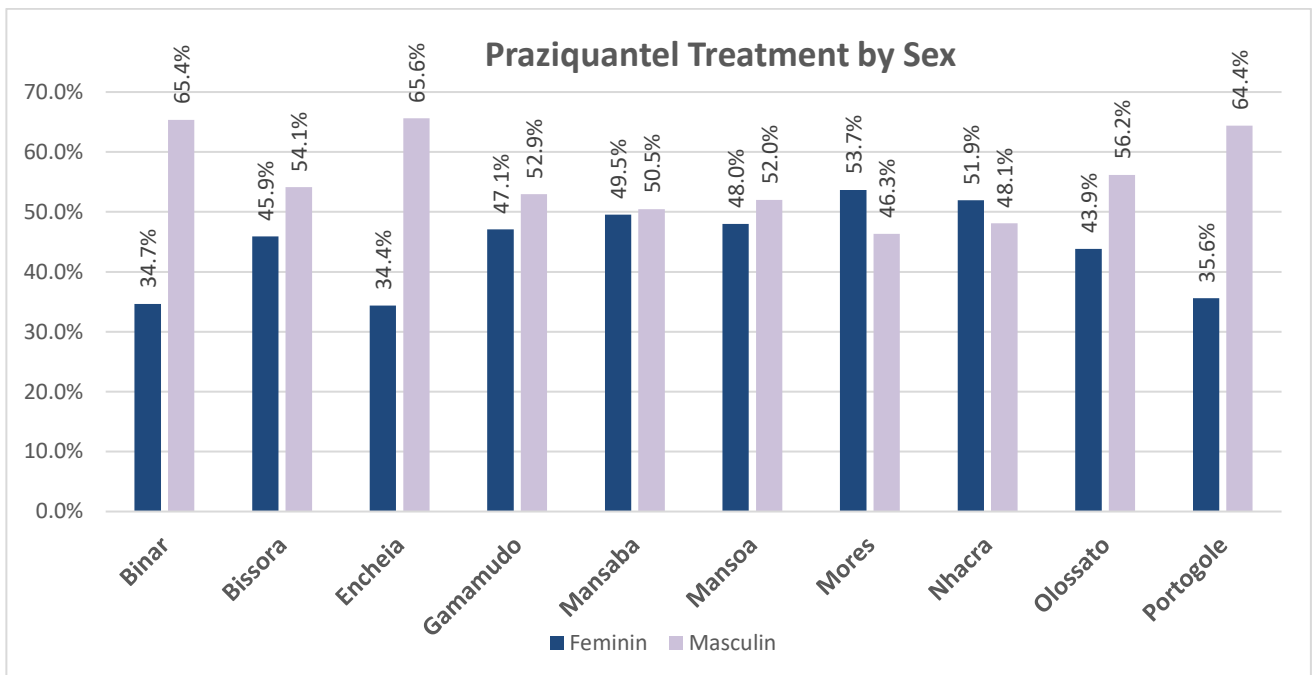


Fig 8: Praziquantel administration by sex and health area.

Side Effect was minimal, with the most predominant being headache, vomiting and diarrhea.

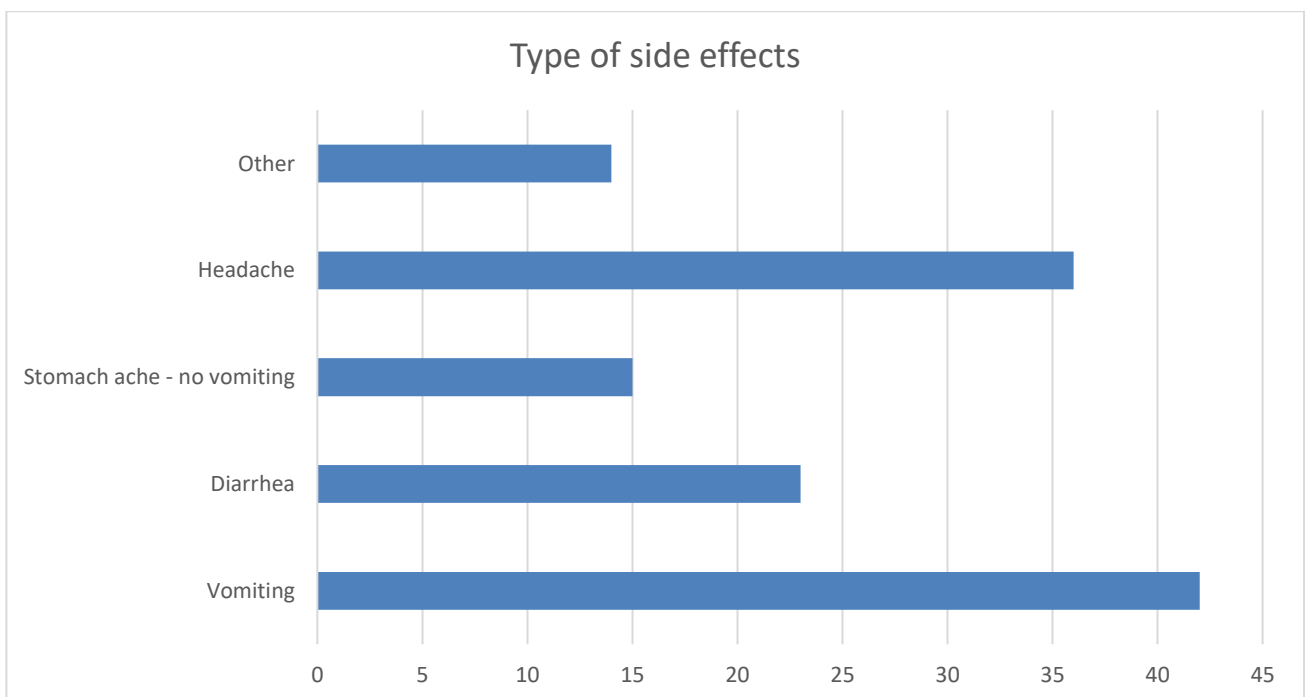


Fig 9: Side effects reported.

C) Reported versus Surveyed Coverage

Figure 10 below shows reported programme coverage versus surveyed coverage at regional level. Reported coverage was less than point estimates at regional level, and outside the 95% confidence interval (96.74, 98.71).

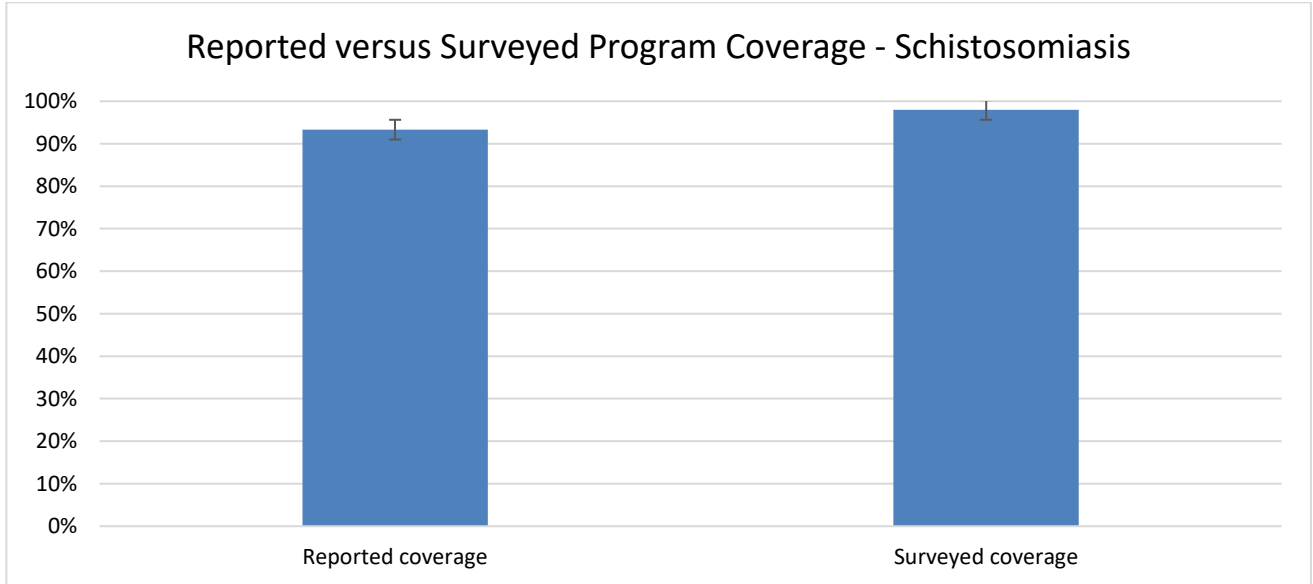


Fig 10: Reported versus surveyed coverage at regional level

Most often at health area level, reported coverage was unusually lower than surveyed coverage as noticed in Binar, Bissora, Mansaba, Mansoa and Nhacra health areas. Only in Olossato was surveyed coverage less than reported as seen in figure 11.

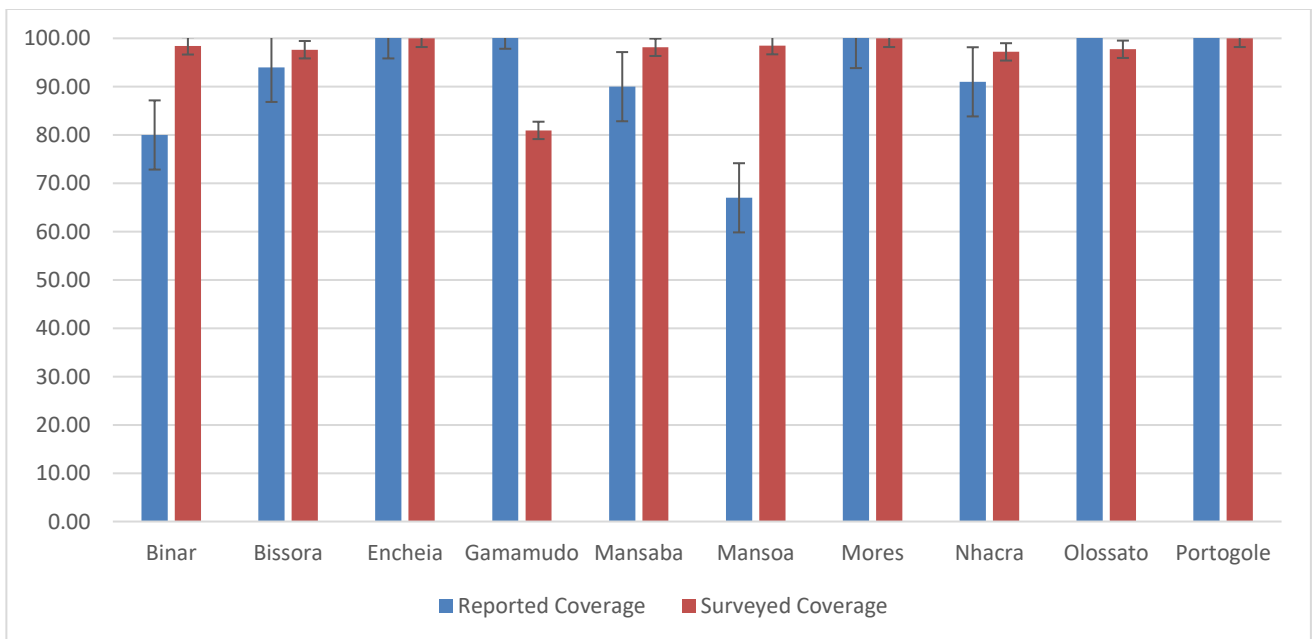


Fig 11: Reported versus surveyed coverage by health area.

Table 6 presents a summary of treatment validation. Reported coverage was considered validated if within the 95% confidence interval. In this case, it wasn't validated because it was outside the confidence interval (CI; 96.74,98.71) of the survey coverage.

Table 6: Summary of treatment validation at regional level.

SCH	Oio
Reported Coverage	93.31%
Surveyed Coverage	97.95%
Upper and lower limit Confidence interval (95%)	(96.74,98.71)
Validation	No
Surveyed coverage attaining WHO threshold of $\geq 75\%$	Yes

Although coverage validation is done at region/district level, if we consider treatment validation at health area, 4 out of 10 health area results will be validated as seen in table 6.

Table 7: Summary of treatment validation by health area.

SCH	Binar	Bissora	Encheia	Gamamudo	Mansaba
Reported Coverage	80.00%	94.00%	103.00%	105.00%	90.00%
Surveyed Coverage	98.45%	97.65%	100.00%	80.95%	98.15%
Upper and lower limit Confidence interval (95%)	98.45 (77.72, 99.91)	97.65 (93.89, 99.12)	100	80.95 (78.57, 82.51)	98.15 (87.87, 99.74)
Validation	Yes	Yes	No	No	Yes
Surveyed coverage attaining WHO threshold of $\geq 75\%$	Yes	Yes	Yes	Yes	Yes
SCH	Mansoa	Mores	Nhacra	Olossato	Portogole
Reported Coverage	67.00%	101.00%	91.00%	113.00%	152.00%
Surveyed Coverage	98.49%	100.00%	97.20%	97.74%	100.00%
Upper and lower limit Confidence interval (95%)	98.49 (95.44,99.51)	100	97.20 (73.51, 99.77)	97.74 (53.61, 100)	100
Validation	No	No	Yes	No	No
Surveyed coverage attaining WHO threshold of $\geq 75\%$	Yes	Yes	Yes	Yes	Yes

D) Reasons for not taking treatment

Most of those who were not treated attested of not being present during the MDA campaign.

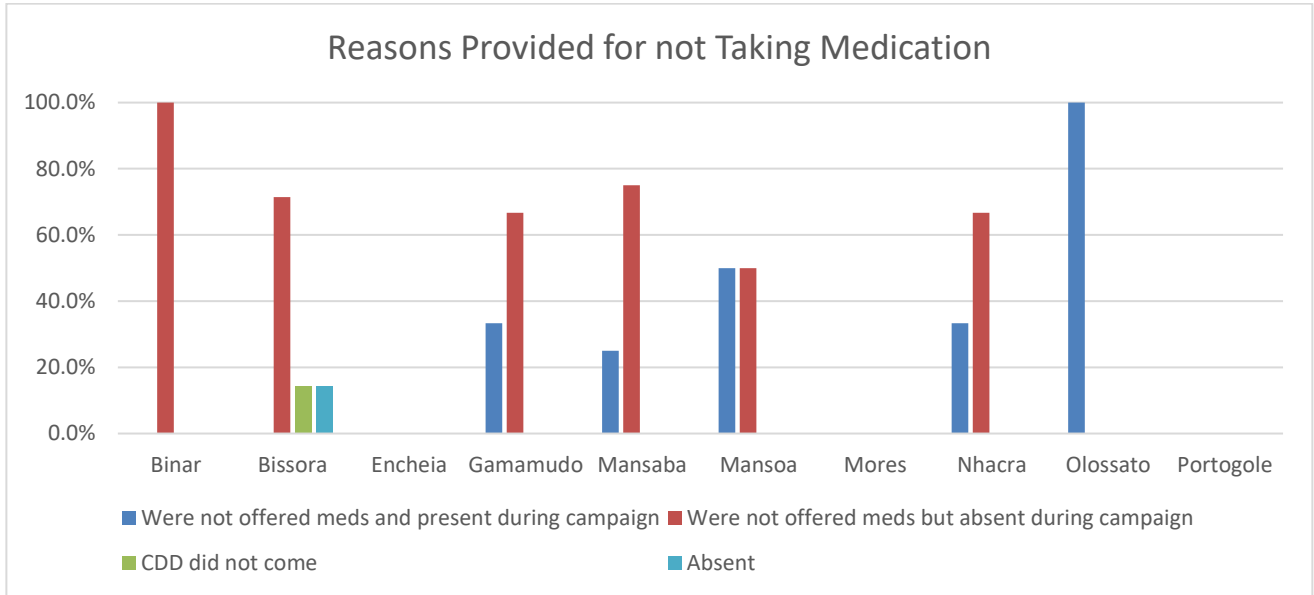


Fig 12: Reasons for not receiving medication during MDA.

E) Sensitization Methods

Amongst the sources of information cited by the children surveyed, CDD was reported the most often (46.16%), followed by a teacher (38.18%) and thirdly by family member (13.04%). Notably, other forms of mass sensitization and use of health center were minimally reported. See figure 12 for details.

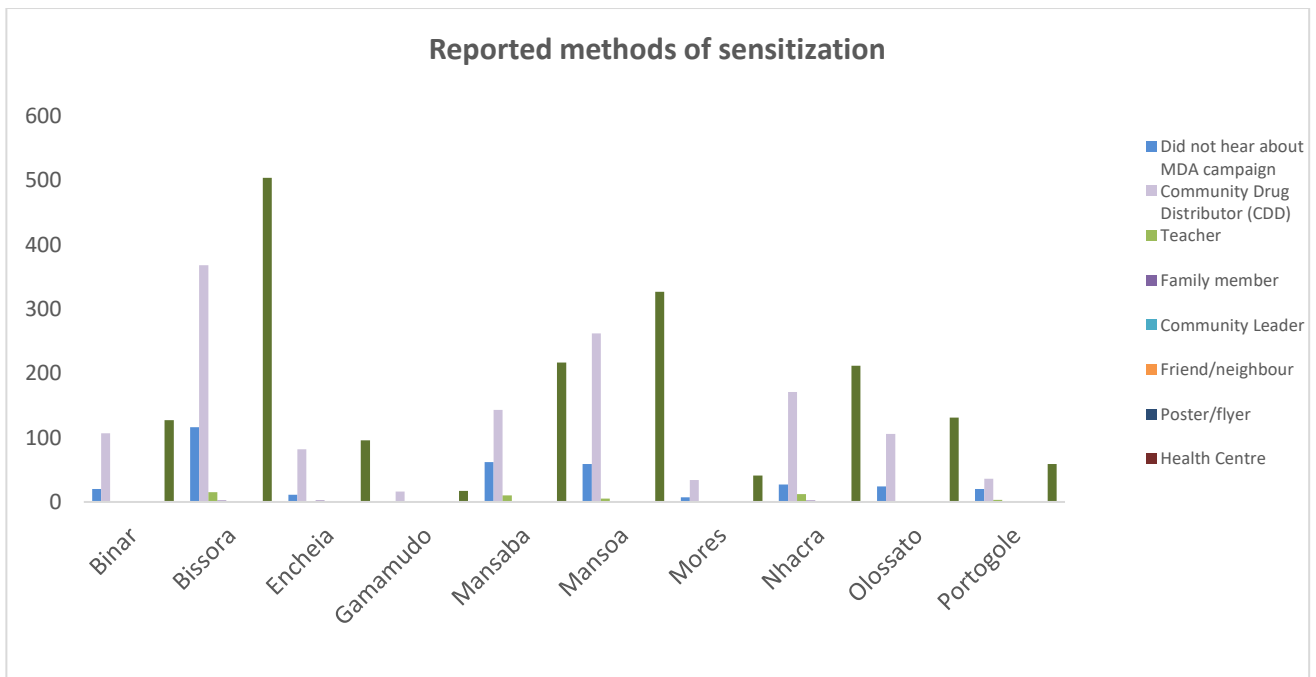


Fig 13: Sensitization methods.

6. Discussion

Contrary to Sightsavers preferred approach to randomly select health districts during coverage surveys, Oio was purposefully selected due to operational challenges, which were partly due to nationwide prolonged strikes within the Guinea Bissau civil service and Sightsavers' desire to mitigate recall bias.

The results of praziquantel distribution against schistosomiasis are presented at regional/district and sub-district level for this survey. Reported coverage for Oio was not validated because the reported coverage didn't fall within the 95% confidence interval of the survey coverage (table 5). The denominator used (2009 national census statistics) to estimate treatment coverage is an inadequate reflection of the project population and most probable reason for the coverage discrepancy.

However, if health area coverage analysis is considered, four (Binar, Bissora, Mansaba and Nhacra) out of ten health area coverages will be validated based on 95% confidence interval of the survey values (table 6). This sub-district analysis aligns with WHO's current approach aimed at optimizing SCH programme delivery at subdistrict level, thereby shrinking the SCH map and ensuring high risk populations (e.g adults and women of child bearing age living high risk zones) previously excluded from MDA are systematically enrolled into the treatment pool.²

The survey also confirmed that MDA for schistosomiasis in Oio (97.95%) exceeded the recommended minimum WHO coverage threshold for SAC of $\geq 75\%$ and this holds true for all ten health areas.

The survey found males (54.3%) more likely to be treated than females (45.6%) at regional level and this was consistent with reported data from MoH. The same observation was noticed at health area level except in Nhacra (51.9%) and Mores (53.7%) where more females were likely to be treated than males.

It was observed that, the MDA platform of choice was the community, though minimal reporting was obtained from schools (70% of health areas reported treatments from schools

² http://espen.afro.who.int/system/files/content/resources/Schistosomiasis%20Data%20analysis%20tool%20-%20Presentation%20%2820190724_English%29.pdf.

as noticed in figure 6). This was slightly different from MoH records which stated 100% of treatments were delivered in communities. This disparity could be attributed to data aggregation errors originating from the frontline health facility level. It is very likely that treatments delivered on school platforms were not reported, potential reason why the survey coverage was higher than reported.

Treatment was delivered to both enrolled and non-enrolled kids, but most of those treated were enrolled, except for Encheia health area with a 54.2% treatment of non-enrolled SAC (Fig 7). This confirms that when community platforms are prioritized in areas with low school enrollment/attendance (such as Guinea Bissau), there is a good chance to treat a maximum number of SAC within the target population, irrespective of their enrollment status. However, the use of hybrid platforms (schools, communities and health facilities) is highly encouraged and data should be correctly aggregated at all levels of the reporting chain, to capture treatments delivered on MDA platforms.

Self-reporting was minimally reported amongst survey respondents as most proxy responses were provided by parents or guardians. This was probably because this survey took place during the peak harvest season when kids are often expected to support their parents in harvesting cashew nuts from the farm. Most of those not treated also attested they were absent during the campaign and this puts to question if home re-visits were done by CDDs to catch-up with kids that were missed during the campaign.

Side Effect was minimal, with the most predominant being headache, vomiting and diarrhea. This further puts to evidence the likelihood of declining side effects with repeated doses of praziquantel. The primary mode of sensitization was the CDD, followed by a teacher and thirdly by family member (Fig 13). Other channels of sensitization such as; public address system, place of worship and health center were minimally reported.

7. Limitations

Due to nationwide prolonged strikes within the Guinea Bissau civil service, it was difficult to randomly sample two health regions as was initially planned. Recall bias was potentially high in regions where MDA was conducted between December 2018 and February 2019.

8. Conclusion

Although the 2018 reported coverage was not validated because it was outside the 95% confidence interval, the survey findings conclude that the project is meeting up with the desired treatment threshold of at least 75%, at the level of the region and health areas. Efforts will be made to improve on data aggregation at all levels of the programme implementation chain, to ensure treatments delivered on both school and community platforms are properly captured and reported.

9. Recommendations

- The MoH should consider reintroducing community registers for census update by CDDs in order to get treatment targets right. This could resolve the challenge of programme coverage estimation, by obtaining a more realistic denominator (tot population);
- MoH should consider using hybrid platforms (schools, communities and health facilities) during subsequent MDA campaigns, to accurately capture and aggregate treatment data delivered on all MDA platforms;
- MDA and coverage surveys should not be planned around peak farming seasons, to minimize response bias potentially obtained from proxy respondents;
- MoH should conduct catch-up/mop-up during the next MDA campaign, to ensure treatment is delivered to SAC missed either in schools or in the communities.