

**Treatment Coverage Validation Survey Following Mass Drug Administration for
Schistosomiasis and Soil-transmitted Helminths**

**Biombo and Farim Regions
Guinea Bissau**

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1. Executive Summary

The first treatment coverage for in Guinea-Bissau was a success. With financial and technical support from Sightsavers and GiveWell, the national NTD team of the Ministry of Health (MoH) has successfully conducted its first treatment coverage survey schistosomiasis (SCH) and soil-transmitted helminths (STH) in Farim and Biombo respectively.

A total of 13,828 individuals in 1,594 households were enumerated by survey teams in both regions. Overall, 94.6% of the survey respondents reported being treated with either praziquantel or albendazole according to the treatment program in each region. In Biombo region survey coverage was 87.1% whilst in Farim, the survey coverage was 99.3%. There is a clear pattern of greater reported coverage by the national programme than survey coverages. In both regions, reported MDA treatment coverage exceeded 118%. However, the results from the treatment coverage exceed the WHO target threshold of 75% coverage for school-aged children.

Based on the lessons learned during the survey, the MoH must place further emphasis on determining the most accurate target population for MDA planning and routine reporting and adjust future campaigns based on previous results as needed. Further, in areas where school enrollment is low, the MoH should consider triple drug administration of praziquantel, albendazole and ivermectin where co-endemic.

2. Introduction

In 2005, the first nationwide baseline survey for SCH and STH was conducted in Guinea Bissau. The prevalence of SCH ranged from 0% to 16% while the STH prevalence ranged from 13% to 93%. After more than 10 years of no treatment, Sightsavers supported the Ministry of Health to conduct a re-mapping survey of the diseases in 2017/18. Results of the survey show show that both SCH and STH are still public health problems in the country.

Based on the re-mapping survey results and in line with WHO deworming guidelines, the following 5 regions were treated for SCH in 2018: Bafata, Cacheu, Gabu, Farim and Sab/Bissau. At the same time, the MDA for STH was conducted in Biombo and Tombali. The MDA conducted in these seven regions (5 for SCH and 2 for STH), targeted school age children which in the context of Guinea Bissau are children between the ages of 5 to 14 years. The campaign was conducted using a combined strategy of both schools and communities with the participation of Ministry of Health and Ministry of Education staff as well as community members.

The MDA campaign for SCH in Farim and STH in Biombo which were the two regions selected for the treatment coverage survey was conducted from April 10-13, 2018. The reported coverages are provided in Appendix One for the surveyed areas.

3. Survey Objectives

The objectives of the survey were as follows

- To verify the coverage of the recent MDA campaign for schistosomiasis (SCH) and soil-transmitted helminths (STH) disaggregated by sex and age

- To identify areas where there was lower MDA coverage or areas which were missed by the recent campaign, in order for relevant action to be taken if required
- To determine factors for not taking medication in the recent MDA campaign and to determine if there was any difference as to participation by drug distributed, sex, age and geographic location.

4. Methods

4.1. Study Setting

The survey was conducted in two regions in Guinea Bissau – Biombo and Farim – from May 25 to June 2, 2018. A three-day training with field practical was conducted prior to field deployment. Participants are provided in Appendix Two.

4.2. Study Design and Sampling

The survey followed a two-stage cluster sampling methodology based on a modified approach to the standard WHO recommended guidelines for coverage surveys. In Guinea-Bissau, the region is the reporting unit; clusters were defined as neighborhoods in the health zones (EA) that comprise the region. In the first stage 131 and 247 EA were listed in Biombo and Sab regions, respectively. Given the uncertainty of population estimates and small cluster sizes, 40 EA (rather than 30) were systematically selected by calculating the sampling interval after choosing a random starting number. The survey assumed coverage to be 50% with a 95% confidence interval. Due to the methodology used, the design effect was set at 4 and non-response at 10%. An estimated sample size of 1706 individuals per region was calculated. Based on an estimated household size of six and two persons of survey ages 5 to 14 years old, a total of 22 households were necessary to sample per EA.

In the second stage sampling of the household was done using the segmentation method. The cluster was divided into segments of approximately 50 households each and one segment was randomly selected to include in the survey. All households in the segment were eligible to participate in the survey. If insufficient households were present to randomly select the target of 22, all households were selected. The head of every household was briefed on purpose and procedure of the survey and provided verbal consent to participate.

4.3. Data collection method and procedure

A questionnaire was designed using the [CommCare](#) survey software application and administered to each household in Portuguese or appropriate local language. Mobile phones were used to capture the responses for various questions or each individual and were automatically uploaded into a web-based database. A total of 16 surveyors collected data working in pairs.

4.4. Data Analysis

Data were cleaned and analyzed using Stata 15.0 (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.

5. Findings and Discussion

5.1. Study population

A total of 13,828 individuals in 1,594 households were enumerated by survey teams in both regions. Summary data for each of the districts are presented in Table 1. The sample size per region differed with 3,063 respondents in Farim and 1,746 in Biombo aged 5-14 years. Table 2 outlines the distribution of age of respondents, which was consistent in Biombo but skewed younger in Farim. There was no difference in sex of respondents by region. See Figure 1.

Figure 2 presents the school status of respondents. There was a significant difference in school attendance between the regions. Respondents in Biombo were more likely to have reported attending school at 78.4% to 31.5% in Farim. When restricted to ages greater than 10 years, the pattern of non-attendance remained similar.

5.2. Treatment coverage

Table 3 presents the survey coverages in each region and the overall coverage results. Overall, 94.6% of respondents reported being treated with either praziquantel or albendazole according to the treatment program in each region. These results exceed the WHO target threshold of 75% coverage for school-aged children. Among those treated, nearly all respondents reported taking the received medication at 99%. No further analysis on adherence was done. Stratification by region demonstrated nominal differences in regional treatment coverage. In Biombo region survey coverage was 87.1% vs 99.3% in Farim.

Figure 3 presents the reported versus surveyed coverage by region. A clear pattern of greater reported coverage than surveyed coverages was observed. Reported coverage exceeded 119% in each region.

Table 4 outlines the surveyed differences in where treatment was received. Results correspond with the differences noted in school status discussed above. Overall, 60.3% of treatments were received in schools. This outcome is distorted by the sample size differences between Farim, where 78.7% of treatments were received at home versus 24.1% in Biombo.

When compared to reported coverage, the place of treatment noted by survey respondents is discordant with data reported by the national NTD program. See Appendix One. Reported MDA data shows that 58.1% of SAC were treated in the community in Farim, versus 78.7% from the survey, and 44.1% in Biombo versus 24.1% in the survey. Each reported figure falls outside the confidence interval of the survey estimates.

5.3. Participation in MDA

Reasons for non-participation in MDA reported by survey respondents are presented in Table 5. Only 249 individuals reportedly did not take treatment out of 4,827 respondents. The majority of these individuals (69.9%) who did participate in MDA were not offered medication but reported being present in their community during the campaign. Additional individuals reporting not receiving the medication also reported being absent due to travel

during the campaign. The overall percentage of respondents identified as being ineligible due to age was equal to the overall age distribution for the survey respondents at 13.5%.

Sensitization methods heard by respondents is presented in Figure 4. Results correspond with how treatment was received in the region with Farim reporting 84.4% from the drug distributor and 66.9% by the teacher in Biombo. Multiple responses were allowed for this question. Overall, 8.3% of individuals did not hear any sensitization about the campaign but took the treatment. Table 5 presents the methods of awareness of the MDA campaign. Respondents noted that family, CDD and radio were the primary means at approximately 70%. However, when stratified by region, as shown in Figure 2, the Sab region had less sensitization from the CDD, more from radio. Overall, 16.4% did not hear of the campaign.

6. Discussion

Overall the TCS validated the national program exceeded the recommended levels of treatment coverage for SAC for SCH and STH at 87.1% in Biombo and 99.3% in Farim. However, each region demonstrated the continued issue of establishing a reliable target population in Guinea-Bissau. Reported MDA coverage by the national NTD program exceeded 119% in each region. Reported coverages exceeded targets by up to three-fold at sub-regional levels. The results here also show that the reported location of treatment differs from that noted by survey respondents.

The survey results infer that the target populations used for routine planning and reporting are potentially inaccurate. This issue was encountered in 2016-2017 in TCS conducted for onchocerciasis and lymphatic filariasis in Sab and Oio regions, where surveyed coverage exceeded reported coverage, meeting WHO recommendations, but was inconsistent with national NTD program data. Thus, while the results here are positive, that the survey with a large sample size demonstrates that medication is reaching the intended population group at recommended levels, it is difficult to affirm the reliability of routine reporting.

7. Review of Survey Implementation

7.1. Strengths:

- Ownership and leadership by the national NTD team of the Ministry of Health.
- Adequate logistics arrangements for the survey, e.g., phones, vehicles, etc
- Support and cooperation by the regional and district authorities
- Experienced and gender diverse data collectors
- Use of local guides
- Community acceptance and collaboration
- Supervisors were on the ground in both regions.

7.2. Limitations:

- Difficulty in communicating with some local communities due to regional dialects
- The survey coincided with the cashew-harvesting period where many people were farming
- Recall issues by respondents

8. Conclusions

This survey was conducted as stipulated in the protocol and in line with WHO guidelines. As a new team, the national NTD team of the Ministry of Health has demonstrated good leadership and ownership in conducting the survey. The results of the survey show good treatment coverages in both regions; however, continued issues with establishing the target population for routine reporting.

9. Recommendations

In view of the above challenges, the following recommendations are made:

1. The national NTD program must evaluate how it establishes its yearly target for SAC for SCH and STH MDA planning. Continued inaccuracies in routine data reporting undermine the overall success of campaign workers are reaching recommended treatment levels in successive coverage surveys. Future population targets for the program should be based on recent MDA treatment data and not regional or national census figures in all areas where reported coverage routinely exceeds the target.
2. In rural areas where school enrolment is below 50% the national program should consider conducting only community-wide MDA in conjunction with onchocerciasis and/or lymphatic filariasis campaigns using triple drug administration of praziquantel, albendazole and ivermectin.
3. Data enumerators must be fluent in the principal local language for survey areas to facilitate communication and reduce the possibility of misunderstanding and wrong data entry.
4. MDA and the coverage survey should be conducted outside the cashew-harvesting season as it is difficult time to conduct activities across the country. Where is cannot be avoided, adequate sensitization will be needed and proper arrangements made with the communities for the survey teams to make their visits when community members are available.

Table 1: Review of Surveyed Households

| Region | Enumerated Individuals | Households | Number of eligible respondents (5-14 yrs) |
|--------------|------------------------|--------------|---|
| Biombo | 5,953 | 819 | 1,764 |
| Farim | 7,875 | 775 | 3,063 |
| Total | 13,828 | 1,594 | 4,827 |

Table 2: Age Distribution of Respondents by Region (%)

| Age | Biombo | Farim | Total |
|--------------|-------------|-------------|-------------|
| 5 | 11.3 | 18.9 | 16.1 |
| 6 | 10.3 | 12.2 | 11.5 |
| 7 | 11.1 | 11.2 | 11.2 |
| 8 | 10.4 | 12.6 | 11.8 |
| 9 | 9.2 | 7.4 | 8.1 |
| 10 | 11.2 | 9.5 | 10.1 |
| 11 | 9.0 | 5.6 | 6.8 |
| 12 | 8.2 | 6.9 | 7.4 |
| 13 | 10.1 | 6.1 | 7.6 |
| 14 | 9.2 | 9.6 | 9.4 |
| Total | 100 | 100 | 100 |
| n | 1764 | 3063 | 4827 |

Figure 1: Sex of Survey Respondents by Region

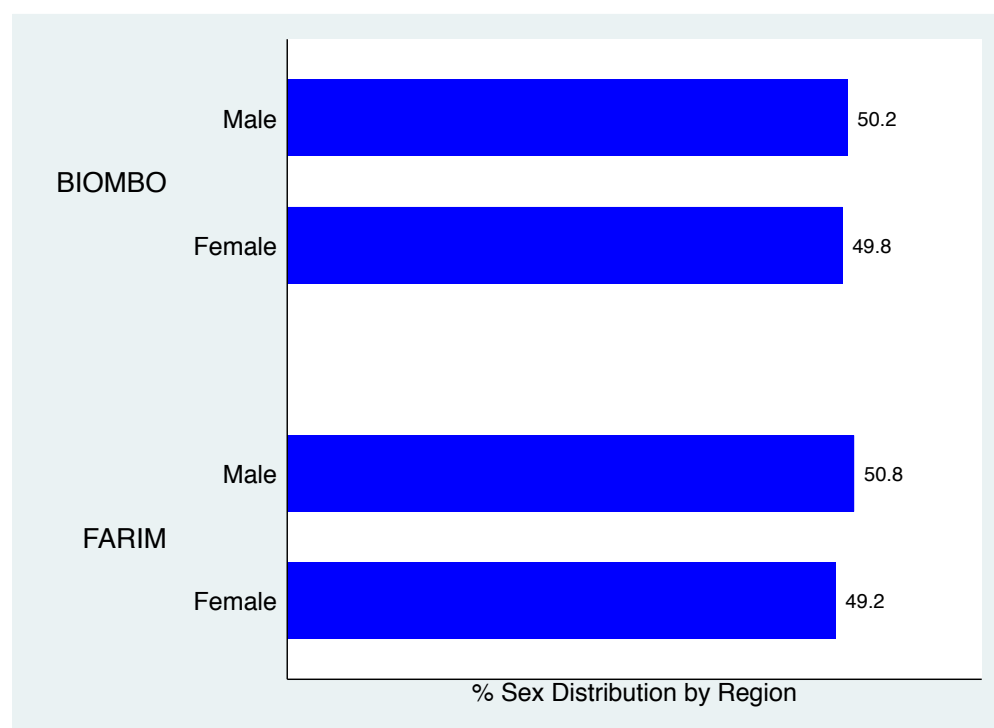


Figure 2: School Status of Survey Respondents by Region (%)

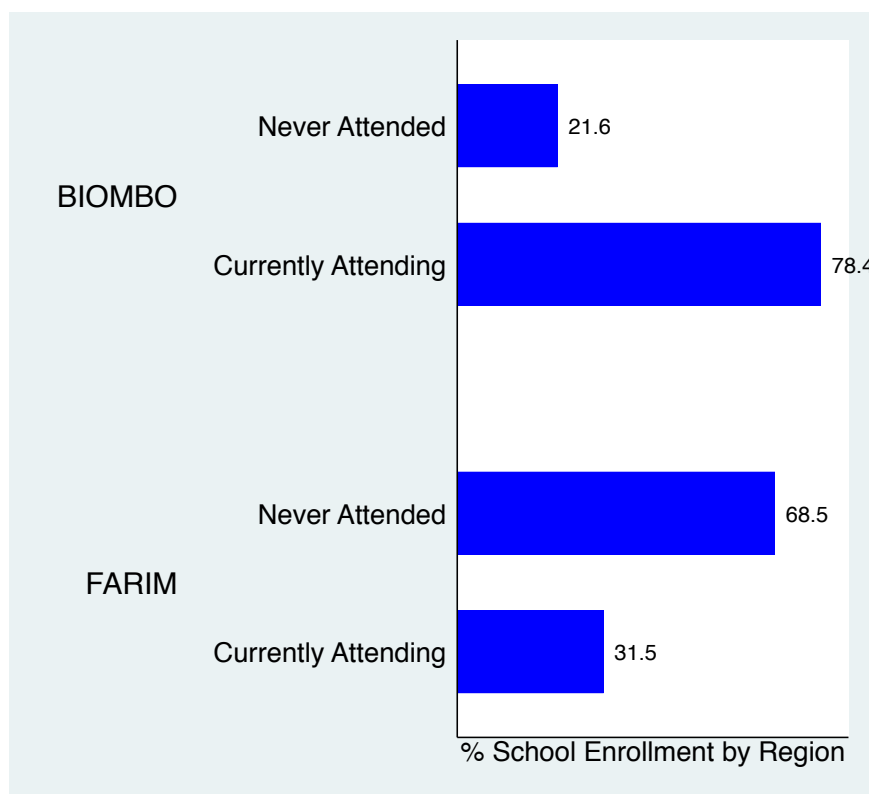


Table 3: MDA Treatment Coverage by Region

| Region | Disease | n | Coverage (%) | 95% CI* |
|--------|---------|-------|--------------|-----------|
| Biombo | STH | 1,764 | 87.1 | 82.7-90.6 |
| Farim | SCH | 3,063 | 99.3 | 98.8-99.6 |

*adjusted for number of enumeration units and surveyed households

Figure 3: Reported vs Surveyed Epidemiologic Coverage by Region (%)

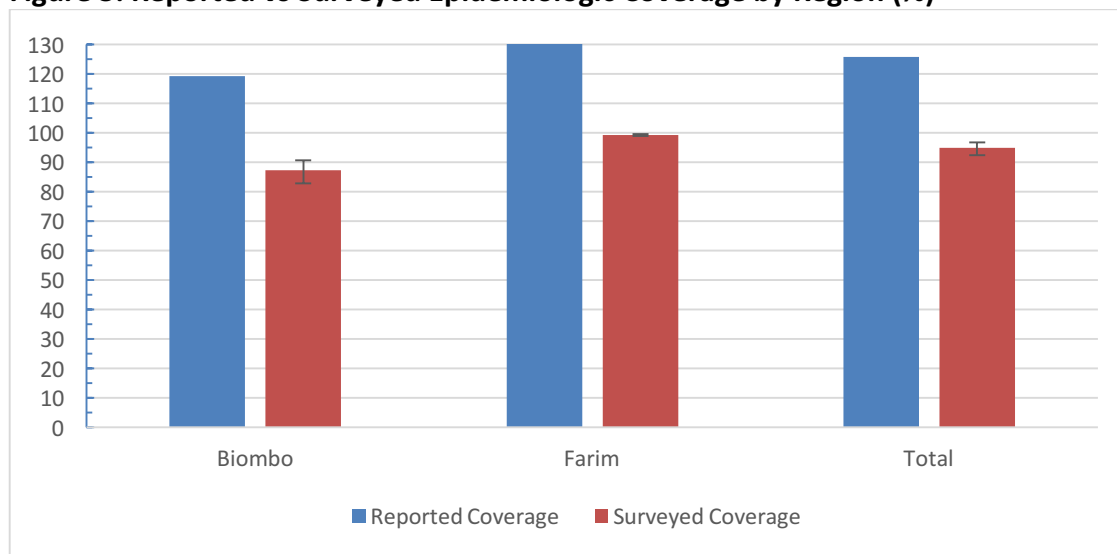


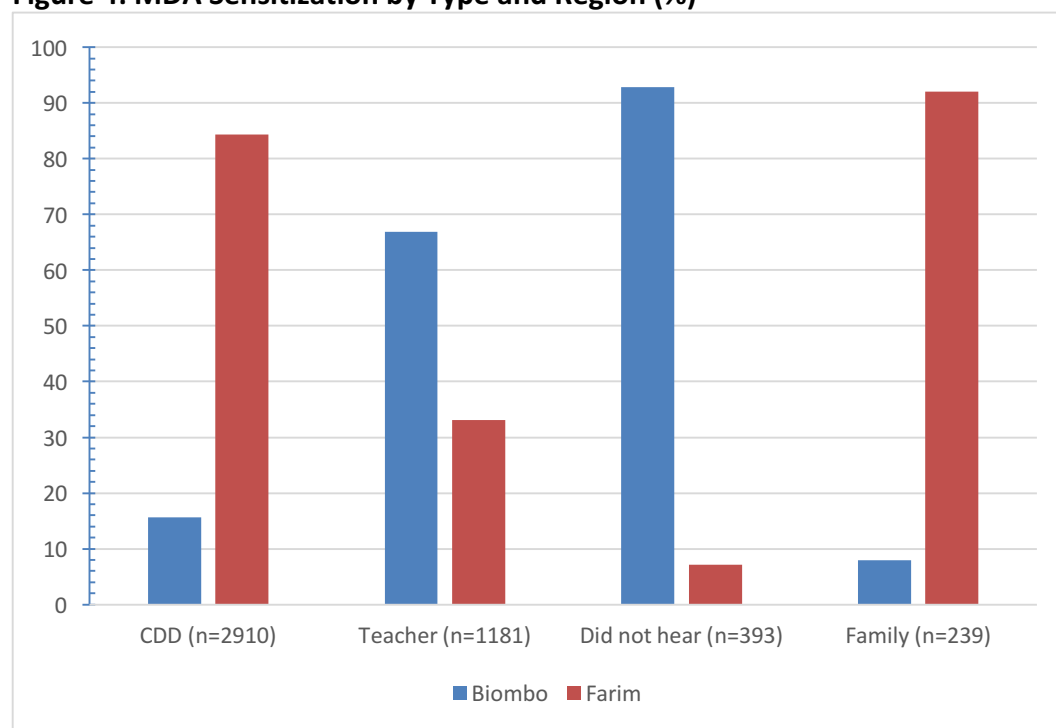
Table 4: Where Treatment was Reportedly Received by Respondents by Region

| | Biombo | | Farim | | Total | |
|-----------------------|--------|-------------------|-------|-------------------|-------|-------------------|
| | n | % (95% CI) | n | % (95% CI) | n | % (95% CI) |
| School | 1,161 | 75.3 (70.2,79.8) | 644 | 21.2 (15.6, 28.1) | 1805 | 39.4 (31.7, 47.6) |
| Home | 372 | 24.1 (19.6, 29.3) | 2,394 | 78.7 (71.8, 84.3) | 2766 | 60.3 (52.1, 68.0) |
| Health Center | 3 | 0.19 (0.03, 1.47) | 2 | 0.07 (0.02, 0.27) | 5 | 0.11 (0.03, 0.41) |
| Don't remember | 4 | 0.26 (0.07, 0.90) | 2 | 0.07 (0.01, 0.46) | 6 | 0.13 (0.05, 0.36) |
| Other | 2 | 0.13 (0.03, 0.55) | 1 | 0.03 (0.00, 0.25) | 3 | 0.07 (0.02, 0.21) |

Table 5: Reasons Provided for Not Taking Medication (%)

| Reason | Total | Num Obs | Biombo | Farim |
|--|--------------|------------|--------------|--------------|
| Was not offered meds and present during campaign | 69.9 | 174 | 98.9 | 1.1 |
| Was not offered meds but absent during campaign | 22.1 | 55 | 74.5 | 25.5 |
| Was healthy | 0.4 | 1 | 100 | 0.0 |
| Was sick/on other meds | 0.8 | 2 | 100 | 0.0 |
| Was absent | 0.8 | 2 | 50 | 50.0 |
| Don't know/remember | 6.0 | 15 | 73.3 | 26.7 |
| Total | 100.0 | 249 | 100.0 | 100.0 |

Figure 4: MDA Sensitization by Type and Region (%)



Appendix One: Reported Coverages for Surveyed Areas

| Region | Disease | Target | Males Treated | Females Treated | Total Treated in Schools | Total Treated in Community | Total | Coverage % |
|--------------|---------|---------------|---------------|-----------------|--------------------------|----------------------------|---------------|---------------|
| Farim | SCH | 13,923 | 10,398 | 8,857 | 8,066 | 11,189 | 19,255 | 138.3% |
| Biombo | STH | 26,841 | 15,875 | 16,120 | 17,873 | 14,122 | 31,995 | 119.2% |
| Total | | 40,764 | 26,273 | 24,977 | 25,939 | 25,311 | 51,250 | 125.7% |

Appendix Two:

List of Participants in the survey

1. Delcio Fernandes
2. Ismael M. S. Cassama
3. Patricio Mendes
4. Adnesia Cabral
5. Alfussene Samati
6. Alanan Mendes
7. Ussumane Tall
8. Malam Sanha
9. Vladimir Gomes
10. Joia R. Indequê (Supervisor in Biombo)
11. Igualdina O. Correia
12. Saturio S. R. G. Malaba
13. Alarica P. C. Manjuba
14. Angelina Cadjona
15. Quintino da Silva (Supervisor in Farim)
16. Tiolisio Nancassa