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Acceptability and Perceived Barriers to Reactive Focal Mass Drug Administration in the Context of a Malaria Elimination Program in Magude district, Southern Mozambique: A qualitative study --Manuscript Draft--

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Full Title:	Acceptability and Perceived Barriers to Reactive Focal Mass Drug Administration in the Context of a Malaria Elimination Program in Magude district, Southern Mozambique: A qualitative study
Short Title:	Acceptability and Barriers to Reactive Focal Drug Administration in Mozambique
Corresponding Author:	Carlos Eduardo Cuinhane, PhD Eduardo Mondlane University: Universidade Eduardo Mondlane Maputo, Maputo MOZAMBIQUE
Keywords:	Acceptability, Barriers, Magude, Malaria, Reactive focal mass drug administration.
Abstract:	This study analysed acceptability and perceived barriers to reactive focal mass drug administration (rfMDA) among community members exposed to community engagement campaigns and malaria elimination interventions in Magude district, following mass drug administration (MDA) in the same district. The study used a formative qualitative study design consisting of 56 semi-structured interviews with community members, including community leaders, household heads, women of reproductive age, members of the community and adolescents, 4 semi-structured interviews with community health workers, 9 semi-structured healthcare professionals; and 16 focus group discussions with adult general population. A content thematic analysis approach was used to analyse the data. The results of this study showed that rfMDA was accepted due to awareness about the intervention, experience of previous similar programme, such as MDA, and due to favourable perceptions built on the believe that rfMDA would help to prevent, treat and eliminate malaria in the community. Perceived barriers to rfMDA include lack of access to accurate information, reluctance to take pregnancy test, concern on drug adverse reactions, and reluctance to take antimalarial drugs without any symptom. In conclusion, the community found rfMDA acceptable for malaria intervention. But more community engagement is need to foster community involvement and self-appropriation of the malaria programme elimination.
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Response to Reviewers:	Dear editor and reviewers, Thank you for reviewing our manuscript "Acceptability and perceived barriers to reative mass focal drug administration in the context of malaria elimination program in Magude district. Southen Mozambique: a qualitative study". The authors of this manuscript have read the comments and suggestions, and agreed to accept the recommedned conditions. All authors have also read and agreed upon the submitted version of the manuscript.

To the Editor:

In addition to the minor comments from the reviewers, I realized the authors have used over 30 pages to describe their results. It is important that the authors re-summarize these findings. I have also attached a marked-up revised copy for other comments.

Answer: The authors re-summarized the findings, and only the essential quotations were left. The new revised manuscript has 28 pages.

If you would like to make changes to your financial disclosure, please include your updated statement in your cover letter.

Answer: The authors added some data related to financial disclosure, but this did not change the statement at all. We have included the new text of financial disclosure in the cover letter.

Answer to the Reviewer #1:

- Typographic error in the manuscript:

Answer: all typographical errors identified were addressed. Moreover, the authors reviewed the whole manuscripts and corrected all possible grammatical errors.

- Results: Please adapt your tables with examples of PLOS ONE tables. Put full stops too at decimal places and not commas. % is written above and not all over the tables.

Answer: all tables were revised and formatted according to PLOS ONE tables, as presented in the new revised manuscript.

Abstract

1. "The reactive focal mass drug administration (rfMDA) was implemented July 2017 to January 2020". Authors should include in the abstract at what period between July 2017 to January 2020 was study conducted.

Answer: The authors included the period that the study was conducted in the abstract, which was between June and September 2017.

Methods

1. In Galatas et al. 2021 in "Community acceptability to antimalarial mass drug administrations in Magude district, Southern Mozambique: A mixed methods study", a population of 48,448 residents, and 10,965 households was provided for a study done during rounds of MDA between November 2015 to February 2017. In this study also conducted in 2017, authors present a population of 63,691 inhabitants and 14,583 households.

Can authors give explanation to the difference in population number in studies done within same period?

Answer: Since the start of the project, the CISM conducted annual census in the district, and Galatas et al. (2021) reported the population of the local census of 2016. However, in the paper, we used the census of the National Institute of Statistic (INE) of 2017 rather than local census because the CISM did not conduct the 2017 local census. We therefore, decided to use the census of INE because we think it is updated compared to the 2016 local census.

2." The study was undertaken in September 2017 before the start of the reactive surveillance intervention and continued during the first two months after the start of the intervention".

a. The above contradicts the initial mention that rfMDA started in July 2017. If the people of Magude district did not benefit from intervention until after September 2017, authors should explain this in the Introduction to support what was mention in the Methods section. Otherwise, corrections should be made in the Methods (Study

	<p>setting) section to agree with the earlier mention. Answer: Indeed, there was an error in the text regarding the period of the study and the start of rfMDA intervention. The correct information is that the study was conducted between June and September 2017, while the rfMDA program started in September 2017. We have corrected this information in the revised manuscript.</p> <p>b. In the Methods section (Study setting), authors should state the duration of study. That is, from September 2017 to when, 2018? Answer: There was also an error in this section about the study period. The correct information is: the study was conducted between June and September 2017.</p> <p>3. "...distributed in 5 Administrative Posts: Magude village, Motaze, Mahele, Panjane and Mapulanguene, and the study covered all these 5 Administrative Posts". In Table 1, some administrative units lacked participants bearing in mind in study purposive sampling was employed. Can authors give reasons why some units lacked participants? Answer: The study sample size did not cover all participants in all study sites due to unequal distribution of the study participants' categories and several constraints to accessing the eligible participants. Health professionals and CHWs were not included in some study sites because they were not in all selected communities, and some community leaders were absent during the data collection. Additionally, it was not possible to include adolescents from Mahele and Mapulanguene because the study took place during the school season, and the eligible participants were at schools in different districts. Furthermore, members of the community from Mahele were not included in the sample of semi-structured interviews because they were unavailable due to their agricultural activities. In addition, the lack of accessibility at the selected study sites during the rainy season constrained the eligible participants' access. Moreover, the data collection strategy used also contributed to unequal distribution of the participants in the study setting. The study started by conducting focus group discussions (FGDs) in all study settings and later carrying semi-structured interview. While FGDs were conducted during late months of dry season, the semi-structured interviews were conducted during the start of rainy season, which constrained access to participants in some study settings (Administrative post of Motaze, Mahele and Mapulanguene). we have added an explanation of the sample distribution in the revised manuscript (page 10 of the revised manuscript with track changes).</p> <p>4. Was the semi-structured interview questionnaire used pre-piloted? Answer: Yes, all guides were pre-piloted as started in line 205, page 11 of the revised manuscript with track changes.</p>
<p>Additional Information:</p>	
<p>Question</p>	<p>Response</p>
<p>Financial Disclosure</p> <p>Enter a financial disclosure statement that describes the sources of funding for the work included in this submission. Review the submission guidelines for detailed requirements. View published research articles from PLOS ONE for specific examples.</p> <p>This statement is required for submission and will appear in the published article if the submission is accepted. Please make sure it is accurate.</p>	<p>This study was funded by The Bill and Melinda Gates Foundation (USA) and la Caixa foundation (Spain), and conducted by Manhiça Foundation (CISM). CISM is supported by the Government of Mozambique and the Spanish Agency for International Development (AECID). There was no additional external funding received for this study.</p> <p>The Bill and Melinda Gates Foundation (USA) and la Caixa foundation (Spain) provided support in the form of salaries during data collection to the following authors: CEC, BG, JML, HD, HN, IM, PA and KM.</p> <p>The funders had no role in study design, data collection and data analysis, decision to publish, or preparation of the manuscript.</p>

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The data of this study were collected under individual-level informed consent and assent after a research protocol was reviewed and approved by CISM's institutional ethics committee (CIBS-CISM) and the Mozambican Ministry of Health National Bioethics Committee. The informed consent signed by the participants stated that: "data will only be available to the study team", and the protocol established that all information will be confidential, and no data from the data collection forms, nor from audio files will be accessible to anyone outside of CISM. Given this statement approved by the two IRBs, data from this study is available upon request to these institutional review boards: CISM's institutional ethics committee (sozinho.acacio@manhica.net) or the Mozambican Ministry of Health National Bioethics Committee (jflschwalbach@gmail.com) for researchers who meet the criteria for access to confidential data.

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1 **Full title:**

2 **Acceptability and perceived barriers to reactive focal mass drug**
3 **administration in the context of a malaria elimination program in**
4 **Magude district, Southern Mozambique: A qualitative study**

5

6 **Short title:**

7 **Acceptability and barriers to reactive focal drug administration in**
8 **Mozambique**

9

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22 **Abstract**

23 This study analysed acceptability and perceived barriers to reactive focal mass drug
24 administration (rfMDA) among community members exposed to community engagement
25 campaigns and malaria elimination interventions in Magude district, following mass drug
26 administration (MDA) in the same district. The study used a formative qualitative study design,
27 consisting of 56 semi-structured interviews with community members, including community
28 leaders, household heads, women of reproductive age, members of the community and
29 adolescents, 4 semi-structured interviews with community health workers, 9 semi-structured
30 interviews with healthcare professionals; and 16 focus group discussions with the general adult
31 population. Data were collected between June and September 2017. A content thematic
32 analysis approach was used to analyse the data. The results of this study showed that rfMDA
33 was accepted due to awareness about the intervention, experience of a previous similar
34 programme, the MDA campaign, and due to favourable perceptions built on the believe that
35 rfMDA would help to prevent, treat and eliminate malaria in the community. Perceived barriers
36 to rfMDA include lack of access to accurate information, reluctance to take a pregnancy test,
37 concern on drug adverse reactions, and reluctance to take antimalarial drugs without any
38 symptom. In conclusion, the community found rfMDA acceptable for malaria intervention. But
39 more community engagement is needed to foster community involvement and self-
40 appropriation of the malaria programme elimination.

41

42 **Keywords:** Acceptability, Barriers, Magude, Malaria, Reactive focal mass drug
43 administration.

44

45

46

47 **Introduction**

48 Mozambique is one of the sub-Saharan countries that has made significant progress toward
49 malaria elimination [1,2]. However, the country is still considered one of the 6 countries with
50 the highest malaria burden in the world, contributing with 4% of worldwide malaria cases in
51 2018 [2]. Several strategies have been implemented in the country to accelerate malaria
52 elimination in southern Mozambique [3]. These strategies include increasing the coverage of
53 long-lasting insecticidal nets (LLINs), yearly rounds of universal indoors residual spraying
54 (IRS), and improvement of case management and surveillance system throughout the country
55 [3,4,5]. These strategies are among the recommended tools of the World Health Organization
56 (WHO) Global Technical Strategy (GTS) for Malaria 2016-2030 [6].

57

58 Magude district, in particular, has been benefiting from a project led by the Manhiça Health
59 Research Centre (CISM) since 2015, which aims to eliminate malaria. The project consisted of
60 implementation of a comprehensive mixed interventions that included LLINs, IRS and four
61 rounds of mass drug administration (MDA) to all the eligible members of the population of
62 Magude between 2015 and 2017 using the half-life drug dihydroartemisinin-piperazine
63 (DHAp) [5,7]. These interventions were implemented following different assessment and
64 baseline studies on malaria elimination in the district [8-10] that informed the perceptions of
65 the community before and during the implementation of the project.

66

67 Some factors influenced the implementation of malaria elimination interventions in Magude
68 district, including refusal of IRS and LLINs use [9], absenteeism of the household head which
69 compromised the decision-making in participation in the MDA campaign, and fear of DHAp
70 and adverse reactions [7]. Notwithstanding these constraints, the implementation of the

71 comprehensive mixed intervention has resulted in a substantial reduction of malaria cases in
72 Magude district [5].

73

74 Although there is significant reduction in malaria cases in the district, elimination of malaria
75 has not yet been achieved. Hence, the WHO recommendation of reactive epidemiological
76 surveillance as an intervention suitable to the late stages of the fight towards malaria
77 elimination [11]. In this context, a reactive focal mass drug administration (rfMDA) was
78 implemented in Magude district, southern Mozambique, from July 2017 to January 2020 to
79 maintain the gains and prevent an upsurge of malaria transmission after MDA.

80

81 rfMDA consisted of following up all passively detected malaria cases at health facilities and
82 community health workers to their households and administering the antimalarial drug DHAp
83 to all household members and neighbours. When a household was visited, the fieldworkers
84 explained the reasons of the visit; enrolled the household members to the study through
85 informed consent forms; administered electronic questionnaires to all household members
86 gathering sociodemographic and malaria risk and prevention information; evaluated each
87 household member's eligibility to be administered DHAp, which included pregnancy testing
88 to consenting women of reproductive age and malaria rapid diagnostic testing to all eligible
89 members of the households; and administered DHAp according to each member's age. The
90 administration of DHAp followed the same procedures used in MDA in the same district
91 [8,5,7]. The implementation of rfMDA strategy was complemented by a community
92 engagement campaign encouraging the population to seek healthcare upon the presentation of
93 fever and to adhere to this reactive surveillance intervention.

94

95 This study analysed acceptability and perceived barriers to reactive focal mass drug
96 administration (rfMDA) among community members exposed to community engagement
97 campaigns and malaria elimination interventions in Magude district.

98

99 **Methods**

100 **Study setting**

101 The study was carried out in the rural district of Magude, located in the northwest of Maputo
102 province, southern Mozambique. In 2017, the national statistics institute's (INE) census
103 counted 63,691 inhabitants and 14,583 households in the district [12], distributed in 5
104 Administrative Posts: Magude village, Motaze, Mahele, Panjane and Mapulanguene [13], and
105 the study covered all these 5 Administrative Posts. There are 9 rural health facilities, 1 referral
106 health centre and 27 community health workers (CHWs) throughout the district [14]. CHWs
107 provide diagnosis and treatment of malaria and other diseases, such as diarrhoea, pneumonia
108 and refer patients with signs of sickness requiring high medical attention [15]. Both health
109 providers and community health workers engage in community sensitization about malaria
110 using a social behaviour change communication approach included in the Plan of the National
111 Malaria Control Program (NMCP) [16]. The level of malaria in the district was considered
112 moderate before de elimination program, with about 200 cases per 1000 prior to MDA [14].
113 The district has been exposed to malaria prevention strategies, such as malaria case
114 management using artemether-lumefantrine, vector control, IRS and the population has been
115 exposed to several malaria research activities before and after the Magude project [5,8].

116

117

118

119 **Study design**

120 This formative qualitative study assessed acceptability and perceived barriers to the reactive
121 surveillance strategy rfMDA among community members exposed to community engagement
122 campaigns and malaria elimination interventions. The study was undertaken between June and
123 September 2017, and it initiated before the start of the reactive surveillance intervention and
124 continued during the first two months after the start of the intervention in July 2017.

125

126 **Sample strategy and sample size**

127 A purposive sampling was performed to select individual members representing different
128 groups in the community. These groups included adult household heads (≥ 18 years old), adult
129 women of reproductive age (18-49 years old), female adolescents (12-17 years old), adult
130 members of the community (≥ 18 years old) and community leaders (≥ 18 years old). The same
131 strategy was used to select adult general population (≥ 18 years old) who composed focus group
132 discussions (FGD). These participants were selected to capture the view and the lay
133 perspective, as well as mapping the barriers with regards to reactive focal mass drug
134 administration. A total of 69 participants of different community groups, comprising individual
135 semi-structured interviews, and 157 participants of the general population, who participated in
136 FGDs, were included in the study (Table 1).

137

138 Table 1. Study sample size

Study setting	Individual semi-structured interviews								FGDs (n=16) with general population		
	Household head	Women of Reproductive age	Adolescent	Member of the community	Community leader	Health professionals	CHWs	Total	Men	Women	Total
Magude village	1	1	5	6	6	5	1	25	8	37	45
Motaze	4	3	2	4	0	0	0	13	1	16	17
Mahele	1	3	0	0	1	2	0	7	13	20	33
Panjane	2	1	2	5	2	1	2	15	7	11	18
Mapulangene	1	2	0	3	1	1	1	9	16	28	44
Total	9	10	9	18	10	9	4	69	45	112	157

139

140

141 The study also included healthcare providers who were engaged in malaria campaigns and
142 malaria elimination interventions. A purposive sampling was used to select 9 healthcare
143 professionals and 4 CHWs in all the study settings (Table 1). Health professionals were
144 working in the health facilities located in the same communities where the study took place.
145 The community health workers also worked in the same communities in coordination with
146 the local health facilities.

147

148 The study sample size did not cover all participants in all study sites due to unequal distribution of the
149 study participants' categories and several constraints to accessing the eligible participants. Health
150 professionals and CHWs were not included in some study sites because they were not in all selected
151 communities, and some community leaders were absent during the data collection. Additionally, it
152 was not possible to include adolescents from Mahele and Mapulanguene because the study took place
153 during the school season, and the eligible participants were at schools in different districts.

154 Furthermore, members of the community from Mahele were not included in the sample of semi-
155 structured interviews because they were unavailable due to their agricultural activities. In addition, the
156 lack of accessibility at the selected study sites during the rainy season constrained access to the
157 eligible participants.

158

159 **Data collection**

160 Semi-structured interviews (SSI) and focus group discussions (FGDs) were used to collect
161 data. Individual SSI were administered to household heads, women of reproductive age,
162 adolescents, members of the community, community leaders, healthcare professionals and
163 community health workers; while FGDs were used to collect data from the adult general
164 population. The size of each FGD varied between 8 and 12 members, and each FGD lasted
165 between 60 and 80 minutes. Data collection guides for both SSI and FGDs were designed to
166 capture perceptions of rfMDA, acceptability of the procedures of rfMDA and the reasons for

167 its acceptability, and barriers that could emerge during the implementation of rfMDA. Guides
168 were prepared in Portuguese, and a pilot test was performed in the local language Changana
169 before the beginning of data collection. Based on the pilot test, the guides were refined. SSI
170 were conducted in both Portuguese and Changana, depending on the language preference of
171 the participants, while all FGDs were conducted in Changana. The interviewers, who are fluent
172 in Portuguese and Changana, were trained to conduct SSI and facilitate FGDs. All interviews
173 and FGDs were digitally recorded, and later independently transcribed in Portuguese. The
174 research team controlled the quality and accuracy of the transcriptions.

175

176 **Data analysis tools**

177 A content thematic analysis approach was used to analyse the data of SSI and FGD. First, data
178 management was conducted using Nvivo 12 (QRS International Pty. Ltd.), a qualitative
179 package for qualitative data analysis, following designed generic outline nodes representing
180 the coding structure. Themes and subthemes emerging from the data were critically discussed
181 until a consensus of the researchers was reached. The final themes were: awareness and
182 acceptability of reactive focal mass drug administration, acceptability of the procedures used
183 in rfMDA and barriers to rfMDA.

184

185 **Ethical considerations**

186 The study was approved by CISM's institutional ethics committee (CIBS-CISM) and the
187 Mozambican Ministry of Health National Bioethics Committee, and it was registered as
188 protocol number Ref:146/2017. All participants received detailed information about the study
189 objectives. A written informed consent was obtained from all participants prior their
190 participation in the study. The study obtained a written informed consent from all parents or
191 guardians of the young adolescents (12-17 years old) included in the study. Additionally, an

192 assent was sought from all young adolescents that participated in this study. Participants were
 193 assured about their anonymity and confidentiality throughout the research process. Thus, all
 194 participants names were not recorded, and all informed consents, digital records and databases
 195 were securely stored at a secure server of CISM.

196

197 **Results**

198 The participants of this study included different community groups, general population of the
 199 community, healthcare professionals and community health workers. Table 2 and Table 3
 200 summarise the characteristics of participants per community group and among the general
 201 population who participated in semi-structured interviews and in focus group discussion
 202 respectively. The majority of participants were married or living with a partner, had primary
 203 school and worked as famers.

204

205 Table 2. Sociodemographic characteristics of participants per community group

Characteristics of participants	Community leaders (n=10) n(%)	Household head (n=9) n(%)	Women of reproductive age (n=10) n(%)	Adolescents (n=9) n(%)	Members of the community (n=18) n(%)
Sex					
Male	10 (100)	7 (77.8)	0 (0)	0 (0)	3 (16.7)
Female	0 (0)	2 (22.2)	10 (100)	9 (100)	15 (83.3)
Educational level					
None	1 (10)	3 (33.3)	1 (10)	0 (0)	2 (11.1)
Primary school	9 (90)	6 (66.7)	6 (60)	7 (77.8)	16 (88.9)
Secondary Education	0 (0)	0 (0)	3 (30)	2 (22.2)	0 (0)

Marital Status					
Single	0 (0)	0 (0)	3 (30)	7 (77.8)	1 (5.6)
Married or living with a partner	9 (90)	9 (100)	7 (70)	2 (22.2)	17 (94.4)
Widowhood	1 (10)	0 (0)	0 (0)	0 (0)	0 (0)
Occupation					
Farmer	10 (100)	7 (77.8)	8 (80)	2 (22.2)	14 (77.8)
Salesperson	0 (0)	1 (11.1)	0 (0)	0 (0)	1 (5.6)
Security	0 (0)	1 (11.1)	0 (0)	0 (0)	0 (0)
Housewife	0 (0)	0 (0)	1 (10)	1 (11.1)	2 (11.1)
Traditional healer	0 (0)	0 (0)	0 (0)	0 (0)	1 (5.6)
Student	0 (0)	0 (0)	1 (10)	6 (66.7)	0 (0)
Religion					
Atheism	1 (10)	2 (22.2)	1 (10)	0 (0)	0 (0)
Christianity	9 (90)	7 (77.8)	9 (90)	9 (9)	16 (88.9)
Animism	0 (0)	0 (0)	0 (0)	0 (0)	2 (11.1)

206

207 Table 3. Sociodemographic characteristics of focus group discussion participants

Characteristics of participants	Frequency	%
Sex		
Male	45	28.7
Female	112	71.3
Education level		
None	51	32.5

Primary	87	55.4
Secondary	19	12.1
Marital Status		
Single	21	13.4
Married or living with a partner	118	75.2
Widow/Widower	18	11.5
Occupation		
Farmer	123	78.3
Labourer	14	8.9
Salesperson	7	4.5
Housewife	5	3.2
Students	3	1.9
Traditional healer	5	3.2
Religion		
Atheism	24	15.3
Christian	125	79.6
Animist	8	5.1

208

209 Table 4 presents the characteristics of healthcare professionals and community health workers. The
 210 majority of participants had secondary school. Almost all healthcare professionals had specialised
 211 training in primary healthcare and working as maternal and child health nursing, general nursing,
 212 technician of preventive medicine and assistant of service, while community health workers had not
 213 any specialised training.

214

215

216 Table 4. Sociodemographic characteristics of healthcare professionals and community health
 217 workers

Characteristics of participants	Healthcare professionals (n=9) n(%)	Community health workers (n=4) n(%)
Sex		
Male	4 (44.4)	2 (50)
Female	5 (55.6)	2 (50)
Education level		
Primary	0 (0)	3 (75)
Secondary	8 (88.9)	1 (25)
High Education	1 (11.1)	0 (0)
Marital Status		
Single	6 (66.7)	0 (0)
Married/living with a partner	3 (33.3)	3 (75)
Widow	0 (0)	1 (25)
Religion		
Atheism	1 (11.1)	1 (25)
Christian	8 (88.9)	3 (75)

218

219 **Awareness and acceptability of reactive focal mass drug**
220 **administration**

221 **Awareness of reactive focal mass drug administration**

222 Most participants of this study were aware about the rfMDA programme that was taking place
223 in the community, and they had participated in the previous MDA campaign. Participants
224 received information about rfMDA from community leaders, community meetings, radio,
225 fieldworkers, neighbours and healthcare professionals after visiting a health facility and being
226 teste for malaria. All participants of different community groups said that the objective of
227 rfMDA was to treat, cure and eliminate malaria. They viewed rfMDA as important to their
228 families and communities because it helped to diagnose, treat and prevent malaria, which they
229 perceived as a problem in the community. Additionally, participants also perceived that since
230 the beginning of MDA and rfMDA programmes, their health status had improved, malaria
231 cases had decreased, and they believed that these programmes cured malaria. One of the
232 participants said:

233

234 *“I think it is good because before this project [rfMDA] started, when my son and I got sick, I*
235 *knew beforehand that the other one would also get sick quickly, so I had to get money urgently*
236 *and go back to the hospital, but since the distribution of the pills, my children and I have not*
237 *got sick until today”* (FGD 04, general population, Mahele).

238

239 Most participants had experienced the rfMDA program, and they said that it consisted of
240 diagnosing, treatment and prevention of all members of the family, as one of the participants
241 expressed his opinion as follows:

242 *“Even myself I got sick with malaria, they came in my house to test, no one else was diagnosed*
243 *with malaria, but everyone was given pills even without having malaria. They didn't give me*
244 *more pills because I was taking pills”* (FGD 15, general population, Motaze).

245

246 **Acceptability of malaria reactive focal mass administration**

247 All participants of different groups of the community regardless their place of residence,
248 accepted and welcomed the rfMDA programme because they perceived that it saved people
249 from dying from malaria, eliminated malaria in the community and helped to improve their
250 health status. Some participants expressed their views as it follows.

251

252 *“The community accepts [rfMDA] because they are seeing that they have no other way to*
253 *prevent the outbreak of malaria or eliminate malaria because malaria kills. It is imperative*
254 *that they accept and comply with the recommendations so that we can eliminate malaria”* (FGD
255 01, general population, Panjane).

256

257 *“I accept because I see that the fieldworkers follow us from hospital to our homes because of*
258 *this malaria disease. When they do follow up it allows everyone to be diagnosed, including*
259 *those who do not like to go to hospital, and so one can fight and eliminate this disease*
260 *[malaria]”* (FGD 09, general population, Motaze).

261

262 Furthermore, all participants accepted rfMDA because it is based on home treatment, which
263 reduced the cost of transport to the health facility, and helped people who are lazy to go to the
264 health facility when they have malaria symptoms and those who live far from the health facility.
265 However, some participants accepted rfMDA because they were following norms from the

266 health facility, and they perceived that if they do not accept malaria treatment, they might
267 experience difficulties in the future malaria treatment at the health facility.

268

269 *“Researcher: Thank you very much. Do you think it is important that we distribute pills in the
270 districts?”*

271 *Participant: It is very important, it helps us with diseases, even the persons who are lazy to go
272 to the hospital when they have malaria symptoms, they end up taking it, because the pills go to
273 their house”* (SSI 03, community leader, Magude village).

274

275 *“Haaa... we accept because those are the norms and you must comply with. If you don't accept
276 to be cured, when you go to hospital (...) while you have malaria, they [healthcare
277 professionals] will say that you are not sick with malaria because you didn't accept this
278 treatment [rfMDA]. They will say that you are happy when people die in the community, and
279 that when you get malaria you will contaminate everyone. So, we accept that when one person
280 from the household gets sick, the fieldworkers come to test the rest of the household members
281 so that everyone is protected”* (FGD 01, general population, Panjane).

282

283 **Almost all participants of different members** of the community assumed that everybody would
284 accept to participate in the rfMDA programme because **most** people were aware of the severity
285 of malaria including its death consequences, and also because they had experience of the
286 benefits of the previous similar campaign against malaria (MDA). They also added that most
287 people were aware that they had common consensus regarding malaria. This consensus
288 consisted on the idea that malaria was a problem of all members of the community, and
289 therefore, they had to fight against it; and they viewed rfMDA programme as a vehicle which
290 helps to eliminate it.

291 *“Everybody will adhere to the programme because uhm, malaria kills. And at that time before*
292 *these pills existed others died because of this disease (...). Because what happens is that when*
293 *people get malaria today, tomorrow they wake up well, it attacks them the day after tomorrow,*
294 *the next day they wake up well, when malaria is rising and then it gets to the point that they*
295 *don't even wake up and then go to hospital when it has risen, the person is already losing his*
296 *life by then. But soon after those pills arrived, we escaped, I still haven't heard that anyone has*
297 *died of malaria now, since we have been taking those pills. Now even if they go around the*
298 *houses giving us pills there is no one who will deny; people will accept”* (FGD 09, general
299 population, Motaze).

300

301 **Acceptability of the procedures used in reactive focal mass drug** 302 **administration**

303 The rfMDA consisted of following up all patients tested for malaria at the health facility or by
304 community health workers. Fieldworkers followed the patients to their homes, performed
305 malaria and pregnancy tests, and treated all eligible household members and the surrounding
306 neighbours. This theme analyses community acceptability of these procedures.

307

308 **From health facility to home treatment**

309 All participants accepted and welcomed the procedure of following up patients from the health
310 facility to their homes. Participants perceived that this procedure would prevent high transport
311 costs from home to the health facility, it would enable them to know the number of people
312 infected by malaria at the household, and it could contribute to eliminate malaria and prevent
313 death from it. Moreover, **some participants** perceived that a visit from the health facility showed

314 an interest of the healthcare professionals about patients that tested positive to malaria. The
315 following excerpts present participants' views who had experience of rFMDA.

316

317 *"We used to die a lot from malaria, because when the person was shaking and could not go to*
318 *hospital, and ended up dying inside the house (...) because many people do not have*
319 *possibilities to take the sick person to hospital. Now, treating the disease [malaria] at home,*
320 *this will decrease malaria and avoid deaths from malaria"* (FGD 09, general population,
321 Motaze).

322

323 *"Participant 2: [Fieldworkers] came to my house because I went to the hospital and tested for*
324 *malaria. They came to my house to visit me. They said they were going to visit other people*
325 *who had also been diagnosed with malaria in hospital. So, they visited me up to two to three*
326 *times. I thank them for the visit since they are visiting me, they want to know if I am better or*
327 *not.*

328 *Participant 5: They are good visits, because they are visiting us after we go to the hospital to*
329 *know how we are doing, it is good like this when healthcare professionals visit us"* (FGD 05,
330 general population, Magude village).

331

332 Healthcare professionals, in particular, hypothesized that communities would accept receiving
333 fieldworkers from the health facility because the procedure will prevent many patients from
334 having to go to the health facility, where they often spend a long time to be treated or attended.
335 In addition, some healthcare professionals viewed the procedure as an opportunity to visit
336 communities; and a such visiting could represent the commitment of the healthcare
337 professionals with the communities and it could strengthen the relationship between them;

338 while others perceived it as an opportunity to identify other patients who could have malaria
339 symptoms and monitor those who have already tested positive to malaria.

340 *“It is a welcome activity because, firstly, when they receive a visit from healthcare
341 professionals, the community feel valued because they know the healthcare professionals go
342 out from the health units to the community to find out about the health situation of that
343 community. For the communities, the visit shows some interest of healthcare professionals to
344 the community. First, we gain that trust with our community as an institution and second, I can
345 say that we manage to detect the possible cases [of malaria] that may be emerging and at some
346 points hidden in the community”* (SSI 04, healthcare professional, Mahele health facility).

347

348 *“Following participants who test positive for malaria is a good activity, because when we go
349 to the house, after we have tested a member, we can see if that member who tested positive for
350 malaria is or is not complying with the medication. But, also at home there might be another
351 member with malaria, so when we go there [in the household], we test, we will know how many
352 people have malaria”* (SSI 05, healthcare professional, Mapulanguene health facility).

353

354 **Acceptability of malaria testing at home**

355 **Most participants** accepted to be tested for malaria at home because they perceived that testing
356 was a way of diagnosing malaria, which a lot of the times can be asymptomatic. In addition,
357 participants said that the home testing enabled to diagnose other diseases that people might not
358 know.

359 *“I accept to do the test because when someone appears who was bitten by mosquitoes, they go
360 to the hospital, then they are able to follow up on that case, they go to the house of the person
361 who was detected with malaria, test the people from home, medicate so that they don't get sick.
362 They do that because that person who was detected malaria and it can be the case that the*

363 *mosquito contaminates the other people, but there can also be people with malaria in that*
364 *household who have not yet gone to the hospital”* (SSI 05, household head, Motaze).

365

366 **Some participants** also perceived that testing was the only guarantee to know their health status
367 and to comply with the prescribed medication. They said that they wished to be tested to know
368 if they had malaria or not, and only thereafter they would be sure about the disease they are
369 suffering from and take the prescribed pills.

370

371 *“If the fieldworkers come to my house and they don't test me, I don't feel happy. I want them to*
372 *test me until they tell us that we don't have malaria, only then will we feel happy, because even*
373 *if you go to the hospital and then arrive with the child when he is sick, if they don't test him*
374 *and then take any pills and give to him without testing him, he won't feel comfortable. If the*
375 *child takes the pills and the next day he doesn't get better, he will say that it is because they*
376 *didn't do any analysis, maybe it's malaria, you don't feel happy”* (FGD 09, general population,
377 Motaze).

378

379 **Acceptability of including neighbours in malaria treatment**

380 Participants were asked if they would accept malaria treatment after their neighbours were
381 tested positive to malaria. All participants said that they would accepted malaria treatment if
382 their neighbours tested positive to malaria, even if none of their household members was tested
383 positive to malaria. This acceptability derived from the fact that participants perceived that
384 malaria was transmissible, and for that reason, including neighbours in malaria treatment would
385 prevent others from getting the disease.

386

387 *“Participant 3: I accept because I will not only prevent the people in my house, but also the*
388 *neighbours (...). This activity of fighting malaria, eliminating malaria from neighbour to*
389 *neighbour is good because we will all be free from malaria.*

390 *Participant 1: In my opinion, I see that it is very good when the fieldworkers come to test me*
391 *for malaria and also test the people at home and the neighbours, because it may happen that*
392 *the mosquito that bit me comes back to bite the people here at home and the neighbours. The*
393 *mosquito can enter in the house of the immediate neighbours.*

394 *Participant 5: Once I have been infected with malaria it may happen that the neighbours are*
395 *also infected because the mosquito bites here, comes out and bites the neighbours. I see these*
396 *activities are very important to prevent malaria” (FGD 13, general population,*
397 *Mapulanguene).*

398

399 **Acceptability of pregnancy testing at home**

400 All participants of different groups said that they would accept pregnancy testing at home.
401 Most participants were aware that a pregnant woman should not take malaria pills. In addition,
402 participants said that most women of reproductive age might not know if they are pregnant or
403 not, and the test would help to disclose the status of the women before administration of the
404 pills.

405

406 *“Participant 3: We accept the pregnancy test because the fieldworker will be following the*
407 *norm "that you cannot give pills if I am pregnant, it may happen that I say I am not pregnant,*
408 *while I am, I want to undo the pregnancy to relieve myself". So, I don't see a problem in this*
409 *issue of taking pregnancy test to know if you are pregnant or not. Also, even if the person has*
410 *not spoken, it is necessary that they first be tested to know if they are pregnant or not, because*

411 *it can happen that they say they are not, while they are, they give pills and the pregnancy*
412 *undoes itself.*

413 *Participant 5: In a household there can be girls, one of them can be pregnant and no one in*
414 *the house knows, she got pregnant and so on, it's not official [refers to a pregnancy contracted*
415 *from a man not known to the family members and who has not gone through some ceremony*
416 *of making the relationship official] so, no, the culprit will not be the fieldworker, because they*
417 *also did not know of the existence of the pregnancy.*

418 *Participant 7: It is also not correct that a girl is pregnant and takes the pills. If the girl is*
419 *pregnant and after taking the pills the pregnancy falls apart, it would be the fault of the*
420 *fieldworker” (FGD 15, general population, Motaze).*

421

422 Both women of reproductive age and adolescents accepted to be tested, and they also knew the
423 importance of pregnancy test before the administration of the malaria pills. They believed that
424 if a pregnant woman took the malaria pills she could suffer abortion. They perceived the
425 pregnancy test as a way of preventing abortion. In addition, some women of reproductive age
426 and members of the community said that they were “*pleased*” to undergo a pregnancy test
427 because it enabled them to uncover the pregnancy.

428

429 *“We do pregnancy tests for women because it can happen that they give pills while she is not*
430 *well, if they give pills while she is pregnant, she can have complications or lose that pregnancy*
431 *here at home, the fieldworker who gave the pills will be guilty” (...)* (SSI 05, woman of
432 reproductive age, Motaze).

433

434 *“The test is very good because you can be pregnant without knowing. The first time I was*
435 *tested I was breastfeeding my baby and I didn't know that I was already pregnant. When they*

436 *did the test, they found out that I was pregnant, but I didn't even know, they did me a big favour*
437 *because even my husband didn't know; the pregnancy was hidden, the child was sucking dirt*
438 *(...). If it hadn't been for the test, I would only realise that I was not well when the belly was*
439 *already big, so the test was very important” (SS 02, woman, member of the community,*
440 *Magude village).*

441

442 Moreover, household heads, both women and men, and community leaders mentioned that they
443 accepted pregnancy test to their wives and female adolescent as they acknowledged that they
444 might not know if they were pregnant or not. In addition, they viewed a pregnancy test as
445 “good” because it helped to uncover several diseases, and it enabled pregnant women to seek
446 the health facility early on for treatment and follow-up of the pregnancy.

447

448 *“The pregnancy test is important because if the person is tested they [fieldworkers] can find many other*
449 *diseases; if they find diseases, the doctors will treat those diseases that she has. The person is tested*
450 *because it may happen that she is pregnant while she has malaria, the child may get it from inside the*
451 *mother [in pregnancy]. When the woman is tested, various diseases will manifest then, so that both*
452 *mother and child will be treated” (SSI 10, household head, Motaze).*

453

454 *“Participant 1: When they test us and find out that we are not pregnant we are happy because*
455 *we are breastfeeding.*

456 *Participant 3: Testing girls for pregnancy does not pose any problems because they have*
457 *grown up. For us mothers, if it is me, finding my daughter in this state [pregnant], for me it is*
458 *a help because I live with her without knowing. It happened to me, I want to be honest, I sent*
459 *my daughter to school without knowing that she was pregnant. The school sent her back home*
460 *because she was pregnant, but if I had known before, I wouldn't have sent her to school.*

461 *Participant 5: I don't see any problem in testing my daughters because if you find out that my*
462 *daughter is pregnant, and tell me I will have information or tell her in secret, she will come to*
463 *know that she is pregnant (...); there is no problem (...)*" (FGD 07, general population,
464 Mapulanguene).

465

466 **Acceptability to take malaria pills at home**

467 **Most participants** accepted to take malaria pills at home even when they were not sick with
468 malaria as they perceived that pills prevented malaria to the members of the family and
469 community members, which in turn prevents people to go to the health facility often because
470 some of them lived far from the health facility. In addition, a community leader stated that
471 since the start of the mass drug administration, he has witnessed a reduction in malaria cases.
472 The same participant also said that the community had learned from previous experiences, such
473 as MDA, that malaria pills protect people from diseases.

474

475 *"I accept taking tablets even without malaria. Even if field workers leave my neighbour's house*
476 *after giving pills, come here at home, we all have a duty to accept, because since we started*
477 *taking pills in 2016 until now we have seen a reduction in malaria. So, we should not refuse,*
478 *we have to accept taking tablets to prevent malaria"* (SSI 09, community leader, Magude
479 village).

480

481 Regarding the easiest group to accept malaria pills, some participants mentioned young and
482 adult women, adult men, elders, community leaders and all people with the experience of
483 malaria disease and those who were not willing their family members to get it.

484

485 *“Neither our ladies' group nor the gentlemen's group can refuse, because when you start to get*
486 *sick, no one is happy about it, we rejoice when our children and we adults are in good health.*
487 *Therefore, we cannot refuse [to take pills]”* (FGD 04, general population, Mahele).

488

489 *“I think the group of mothers are the ones who understand the most, because they have younger*
490 *children. They quickly understand why they prevent themselves and their child's health. They*
491 *usually follow the healthcare programmes. The elderly also easily accepts to take the pills. In*
492 *general, adults will accept because they comply with one thing and another that is said. When*
493 *you speak, they feel firm in your words and you make sure that you also do it in your house,*
494 *they like it”* (SSI 04, community health worker, Mapulanguene village).

495

496 **Barriers to reactive focal mass drug administration**

497 Questioned on the main barriers to the reactive focal mass drug administration, the different
498 community groups said that there were some barriers regarding the ongoing implementation of
499 rfMDA. They predicted that not everybody would accept to be tested and some community
500 members might insult or mistreat the fieldworkers because each member has its own way of
501 thinking. Additionally, some participants said that some household heads might not allow
502 fieldworkers to enter in the house and treat the members of the family, or fieldworkers might
503 be poorly treated, while others pointed out issues related to the absence of some or all members
504 of the household. For the participants, these barriers could hinder the rfMDA programme.

505

506 *“It is possible that the person you are going to meet in some household will insult you; he may*
507 *say: go back with that job of yours (...). Other people may make jokes and talk a lot of nonsense*
508 *(...)”* (SSI 05, community leader, Magude village).

509

510 *“The only barriers they [fieldworkers] can find are like arriving at a house and not finding*
511 *anyone. After sometimes, this family may get sick while people [fieldworkers] have already*
512 *passed (...)”* (SSI 17, member of the community, man, Panjane).

513

514 **Barriers to home testing for malaria**

515 Regarding the barriers to home testing, participants mentioned some barriers, such as the
516 repeated pricks to collect blood samples and difficulties to collect blood samples among
517 children because some participants perceived that the blood of the child would finish as
518 children do not have a lot of blood. In addition, it was also mentioned that some household
519 heads might not accept the test for themselves and their family members due to lack of
520 awareness about the malaria test.

521

522 *“Difficulties may exist when fieldworkers prick children and the blood doesn't come out, or*
523 *when they prick someone and the blood doesn't come out; when they insist and prick up to*
524 *three times on the same finger the person starts to feel pain. And, when it's a child, if they prick*
525 *several times the blood will finish because the child still doesn't have much blood”* (FGD 07,
526 general population, Mapulanguene).

527

528 *“What might be a hindrance to the activity is if the head of the household does not accept the*
529 *malaria test for himself and his household members because he might not think it is important*
530 *(...). If the householder refuses, it will not be possible to do the malaria test”* (SSI 04, member
531 of the community, man, Magude village).

532

533 **Barriers to pregnancy test**

534 Participants presented several barriers regarding pregnancy test, which included, management
535 of positive pregnancy test disclosure specially when the women's husbands work far from
536 home, existence of difficult groups to preform pregnancy tests, perceptions about who should
537 perform a pregnancy test in women, as well as, the fear of family problems.

538

539 Participants agreed that it would be difficult to test and manage pregnancy test results among
540 women whose husbands work and live in South Africa. In fact, among the male participants,
541 particularly the ones working far from their homes, raised a concern regarding the disclosure
542 of the pregnancy test result. The concern was that the disclosure of pregnancy in their absence
543 could create worries as the community would be the first to know, and they might not certify
544 if their wives were faithful. Thus, they requested that the disclosure of the pregnancy test should
545 be a secret.

546

547 *“There will be problems in my house with my sister-in-law because her husband is not in, he*
548 *went to South Africa. So, if the fieldworkers find out that she is 2 months pregnant while her*
549 *husband has long travelled to South Africa, we need to have a good talk with her. But if it is*
550 *my daughter who is pregnant, there is no problem. You can tell me” (FGD 07, general*
551 *population, Mapulanguene).*

552

553 *“Participant 3: Regarding the difficulties of pregnancy testing for women, we request that your*
554 *fieldworkers who will be distributing pills, have confidentiality because from my wife's side, I*
555 *work and stay a long time on duty, I end up staying 2 months without coming back. I may think*
556 *that my wife has nothing [pregnancy] while she is pregnant. So, if there is a leak that my wife*
557 *is pregnant and I don't know, nor have I seen; excuse me, but we need to be clear, because I*

558 *will no longer know if that pregnancy is mine or not. Your fieldworkers should have*
559 *confidentiality; (...) you didn't come to destroy our homes, you came to help us, so we ask for*
560 *confidentiality when it is proven that women are pregnant.*

561 *Participant 5: I agree with what the colleague said. It would be good if fieldworkers could test*
562 *and say how many months of the pregnancy: one or 2 months; because I can stay in South*
563 *Africa (...) 3 or more months working outside home and, the fieldworkers find out that my wife*
564 *is 2 months pregnant, but I have been outside home for more than 3 months (...). Then when*
565 *they find out that she is pregnant, the fieldworkers cannot talk in the community because they*
566 *have not come to destroy our homes” (FGD 08, general population, Mapulanguene).*

567

568 Regarding the difficult groups to perform pregnancy test, both adult women and men,
569 community health workers and community leaders mentioned adolescents. They predicted that
570 adolescents may refuse the pregnancy test at home due to fear of their parents, because if they
571 are tested positive, their parents would know that they are pregnant and this can be a family
572 issue as they might be hiding the pregnancy.

573

574 *“The ones who usually deny pregnancy test are the girls. Since the test will be done at home,*
575 *they know that if they test me here where the breast is, she will find out that I am pregnant”*
576 *(FGD 09, general population, Mahele).*

577

578 *“Girls tend to hesitate to take the pregnancy test. They say they are not pregnant while they*
579 *are hiding” [the pregnancy] (SSI 10, community leader, Mapulanguene).*

580

581 Adolescents, however, said that they were not afraid of pregnancy tests. They added that who
582 had to decide about pregnancy testing for them were their parents. They perceived that their

583 parents may not allow them to do pregnancy testing due to social norms. They explained that
584 if they are found pregnant they had to inform their mothers, and not their fathers or the mother
585 and the father at the same time.

586

587 *“Mums might not accept their daughters taking the pregnancy test because if me and my*
588 *parents, mummy and daddy are sitting in the same place, no matter how much something*
589 *forbidden happens to me [menstruation or pregnancy] I can't tell my dad. I have to go and tell*
590 *my mummy because I don't know anything yet, I'm underage, they tell me to do this, this and*
591 *this, and I say 'that's fine thank you'. Then mummy might not accept that I do pregnancy test in*
592 *front of my daddy because he will know the results immediately”* (SSI 01, adolescent, Magude
593 village).

594

595 Some participants, particularly women of reproductive age, said that some household heads
596 might not accept their wives to perform a pregnancy test because most men perceived that a
597 pregnancy test must be performed by a woman and not by a man fieldworker. Participants
598 added that some women might refuse pregnancy test due to fear of violence of their husbands.

599

600 *“The group that might not allow women to do the pregnancy test are men, because they think*
601 *that a man has no right to test pregnancy on a woman, only a woman can test pregnancy on*
602 *another woman”* (SSI 17, member of the community, woman, Panjane).

603

604 *“Women may refuse pregnancy testing for fear of violence of their husbands; this can happen.*
605 *Some men may be violent to their wives if they accept the test without their consent”* (FGD 10,
606 general population, Magude village).

607

608 However, other participants, particularly men, said that women of reproductive age do not like
609 to do pregnancy tests at home because they said that if they wanted to know about their
610 reproductive health, they would go to the hospital.

611

612 *“There are many women [of sexually reproductive age] who do not like to take a pregnancy*
613 *test. When they are talking on the street, they say that 'testing people is not good, because if I*
614 *want to have a baby, I know the way to the hospital, I know how to do it, testing people is not*
615 *good'. (...). It has been more the women who deny the pregnancy test because they say that they*
616 *know where to get help, which is in the hospital”* (SSI 04, household head, Motaze).

617

618 Other participants said that some women might deny pregnancy test due to fear of pregnancy
619 disclosure within the family. Additionally, they said that some women might also make use of
620 pills distributed to prevent malaria to do the abortion of unwanted pregnancy, as they are
621 already aware that malaria pills may interfere with the pregnancy.

622

623 *“Other women may refuse to do the pregnancy test if they know they are pregnant and they did*
624 *not want to [unwanted pregnancy], and they may want to take the pills without testing to take*
625 *advantage of the pregnancy [have an abortion] ... because in the other malaria campaign*
626 *[MDA] it was said that if you take pills when you are pregnant, the pregnancy will come out*
627 *[you can have an abortion]. But, other women can refuse to be tested because it can be found*
628 *out that they are pregnant Our daughters may not know that they are pregnant, but after*
629 *the test they will know and we will also find out and ask them about the pregnancy”* (FGD 09,
630 general population, Motaze).

631

632 **Barriers to the administration of malaria pills at home**

633 All participants pointed out some barriers that can hinder the uptake of malaria pills. These
634 barriers included people's perception and habits about when to take pills, side effects, lack of
635 compliance on the dosage, lack of decision-making by the household head, conflict of
636 prescription between the recommended malaria pills and local traditional medicines, lack of
637 adequate information, and existence of groups who can refuse to take pills.

638

639 Regarding people's perceptions about when to take pills, some healthcare professionals
640 mentioned that most members of the community perceived pills as substances to be taken when
641 they are sick, and it would be challenging to request people to take malaria pills while they
642 were not feeling sick.

643

644 *"I think that there will be some barriers because our communities, the characteristic of our*
645 *communities, is to take some pills when they are sick. So, when you arrive in the community*
646 *and tell people to take pills while they do not feel sick, then this ends up creating a situation*
647 *that is not good for the community. So, this is the main barrier that even we as an institution,*
648 *we have been facing because they only take pills when they are sick"* (SSI 04, healthcare
649 professional, Mahele health facility).

650

651 In fact, to substantiate healthcare professionals' predictions, some participants, particularly
652 household heads and adolescents, confirmed that they would not take malaria pills unless the
653 test shows that they have malaria, even if their neighbours or other members of the family were
654 tested positive to malaria.

655

656 “(...) I cannot accept taking pills just because they tested and found that my neighbour had
657 malaria while my test was negative, because they tested to know if I have malaria, and they
658 told me that I don't have malaria; and then if they give me pills to take; that I cannot accept”
659 (SS 01, household head, Panjane).

660

661 “I can't accept to take pills because I don't have malaria, even if my neighbour was detected
662 malaria in the hospital” (SSI 01, adolescent, Panjane).

663

664 Another barrier was regarding participants' previous experiences of malaria pill's side effects.
665 Some participants said that some people might not accept taking malaria pills because when
666 they took in malaria pills in the previous campaign (MDA), they experienced dizziness.

667

668 “People may not take the pills because of dizziness, because the pills cause dizziness; they
669 make you dizzy. It happened with my grandson, he got dizzy, he was shaking after taking
670 malaria pills in the second day. We went to the hospital and they prescribed other pills that we
671 have to buy from the pharmacy outside, but the pharmacy was closed because it was Sunday,
672 and it was difficult to manage the situation” (FGD 11, general population, Magude village).

673

674 Lack of compliance with malaria pills dosage was also reported as a barrier. The discourse of
675 some participants pointed out that some people only took the pills in the first day, in the
676 presence of the fieldworkers. But, they did not adequately take the pills in the following 2 days
677 as they had been recommended.

678

679 “I think that there are still difficulties in taking the pills because some people, when the
680 fieldworkers leave those pills that they have to take in the absence of the staff, some don't take

681 *it. I can believe that some don't take it, this is because the same person... the same family*
682 *member, whose other was tested positive, when they leave it for him to take it, he doesn't take*
683 *them, and three days later he shows up at the health facility with malaria, and sometimes, when*
684 *we ask if he took the medicine that fieldworkers left, and he says yes, while he simply didn't*
685 *take it"* (SSI 2- healthcare professional, Magude village health facility).

686

687 *"(...) Most people do not take pills until finishing the dosage. They interrupt it and drink beer,*
688 *but they won't get better, they will always be in hospital because they have transgressed the*
689 *norms, crossed the line, and they will always get sick"* (FGD 01, general population, Panjane).

690

691 Healthcare professionals and community health workers mentioned the absence of the
692 household head or lack of his consent as a barrier to all family members to take the pills.

693

694 *"One of the barriers would be if field workers arrive in a household where the head of*
695 *household is not there, practically that person will not be attended to. Fieldworkers will not be*
696 *received, they will have to wait for the head of household to authorise, then they will not be*
697 *able to work"* (SSI 05, healthcare professional, Panjane health facility).

698

699 According to the participants, the intake of traditional medicines might be another barrier to
700 home intake of the drug. Community leaders and healthcare professionals mentioned that there
701 might be a conflict between the recommended malaria pills and local traditional healers'
702 practices. They explained that some traditional healers may refuse malaria pills alleging that
703 they treat it themselves. Others said that children or other people might not be allowed to take
704 malaria pills at the same time that are taking traditional medicine prescribed by the traditional
705 healers.

706 “Another barrier would be to get to the household head, let's suppose that the head of that
707 household is a healer, he thinks he can treat malaria, or he can only treat the person who has
708 malaria, not those people who don't have it, he knows how to do things. He will say: no, here
709 at home these are the rules, I treat it, no one get sick of malaria (...). It would be difficult to
710 convince him because he thinks that he can treat himself, he is already a doctor, he calls himself
711 a house doctor, it would be difficult to medicate this healer, because he thinks that he is also a
712 professional. And he may not let the fieldworkers do their job because of some myths. You can
713 explain to him that there is no traditional treatment for malaria, but he still has these taboos”
714 (SSI 05, healthcare professional, Panjane health facility).

715

716 “For example, here in Mapulanguene [name of administrative Post], there are traditional
717 healers who prescribe traditional medicine to children and other people. You may come to a
718 family, and they can say: "today I gave traditional medicine to my son, and he/she cannot take
719 malaria pills", you may find that” (SSI 10, community leader, Mapulanguene).

720

721 The future possibility of getting malaria sometimes after taking the pills was mentioned as
722 another barrier. Some healthcare professionals said that some people might ask “for how long
723 they will get malaria after taking pills?”, and if they are aware that even taking the pills, after
724 sometimes (approximately 6 weeks) they can still get malaria, they might not adhere to the
725 pills.

726

727 “One of the barriers would be, for how long will I not have malaria, for how many years? That
728 question anybody can ask, as long as they don't have exact information about the drug, they
729 can ask this question for how long, if it's for a short time, he or she may reject saying: ‘there's...

730 *I don't have malaria, what's the point if after so long I'll have malaria”* (SSI 05, healthcare
731 professional, Panjane health facility).

732

733 Indeed, some participants with previous experience of malaria pills treatment questioned the
734 usefulness of the malaria pills because they still got sick even after taking the pills.

735

736 *“We heard that malaria will end after taking the pills, we took the pills but we still get sick with*
737 *malaria”* (FGD 08, general population, Mapulanguene).

738

739 Almost all participants said that the main barrier would be the lack of adequate information
740 about the importance of pills for malaria prevention. They also added that another barrier would
741 be lack of information about how and when to take the malaria pills. Participants reported that
742 not all fieldworkers offered adequate information before requesting people to take the pills.

743

744 *“Inform your fieldworkers who are distributing pills, in the beginning there were problems*
745 *because people said that: 'I cannot take pills because we had not eaten', and we are not yet*
746 *well clear in our heads. We asked that when the campaign starts, also bring food because we*
747 *thought we could take pills after the meal; while it is not. We went to find out that it was a*
748 *mistake of some fieldworkers. It is not everything that they tell us, that they explain clearly in*
749 *the households. Some fieldworkers misrepresent the information, it is important that they come*
750 *while they have clear knowledge of what they are going to do. They say that these pills can*
751 *only be taken after the meal”* (FGD 08, general population, Mapulanguene).

752

753 In fact, some healthcare professionals experienced the impact of this misinformation in some
754 communities. They reported that some people refused to take pills unless it was also
755 accompanied with some food distribution.

756

757 *“The big barrier, which is not even my opinion, but it is what I have experienced in the*
758 *community, is that once I went to talk to my neighbour, I tried to convince her to take the pills,*
759 *but she did not accept for the following reason, she says: “first they should give us food, they*
760 *always only come to give us pills after pills, first you have to eat to be able to take pills. Why*
761 *don't they give us food? They are only handing out pills”, this is one of the barriers that is*
762 *common in the community”* (SSI 07, healthcare professional, Magude village health facility).

763

764 Additionally, some community health workers and general population who participated in this
765 study reported that it would be difficult to convince members of the community to take pills
766 because the fieldworkers were outsiders, and local community health workers or members of
767 the local communities were not involved in the campaign.

768

769 *“In the previous campaign, it would have been possible to eliminate malaria, but it was not*
770 *possible because outsiders were recruited and worked in the campaign. We had problems*
771 *because they [fieldworkers] did not work with us [local community health workers]. So, in*
772 *some households, they had difficulties because people did not accept to take pills as they did*
773 *not trust those who were distributing pills”* (SSI 04, community health workers,
774 Mapulanguene).

775

776 With regards to the groups that are resistant to take malaria pills, participants presented mixed
777 perceptions. Most of the participants said that young people, particularly boys and drunken
778 people were mostly the groups that would refuse to take pills.

779

780 *“The group that refuses to take pills is the group of boys, because I have a boy who refuses to*
781 *take it, he does not accept it, but we take it [adult men and women] (...). We don't succeed to*
782 *convince young people to take pills. They will not take it. You can meet them here at the gate*
783 *and say that you need person 'X', he will tell you that he has just left, while it's himself. The*
784 *fieldworker will leave, but if I tell the fieldworker that 'that is the person you are looking for';*
785 *he can turn and kill me”* (FGD 10, general population, Magude village).

786

787 *“We drink beer, when you arrive, I will have already drunk beer, they [fieldworkers] give us*
788 *medicine and tell us to take it, while we are already drunk. Even those pills that others say are*
789 *bad, in reality, they don't make you sick, when the fieldworkers arrive they find me drunk and*
790 *they tell me to take [pills] there in the presence of them [fieldworkers], so, the person gets*
791 *drunk twice”* (FGD 06, general population, Magude village).

792

793 Adolescents and healthcare professionals, however, perceived that adult people working in
794 South Africa and elderly were groups that would mostly refuse to take pills.

795

796 *“The majority, the new ones, (...) I'm talking about the young people, those don't have*
797 *problems. I believe that a big part of the people who inhibit family members from taking pills,*
798 *are adult people who work in South Africa, because they don't know where we are coming from*
799 *and where we are going to. They don't get the information in the first hand, or hear it from*

800 *someone; they only hear rumours, and they end up inhibiting their relatives from taking the*
801 *pills”* (SSI 08, healthcare professional, Magude village health facility).

802

803 *“The elderly and fathers [adult people] only take pills when they want, others only take them*
804 *in the first day, the next day they don't take them, and they say: "as soon as they [field workers]*
805 *are gone, they won't see that we are not taking it" and, they leave the pills”* (SSI 10, adolescent,
806 Panjane).

807

808 **Perceptions about ways to increase adherence to reactive focal mass drug** 809 **administration**

810 All participants of different community groups perceived that several strategies could be used
811 to increase community participation in rfMDA, including the need for more awareness about
812 rfMDA, planning of the activities, access to accurate information about antimalarial pills,
813 supervision during the administrations of the pills and improvement of attitudes of
814 fieldworkers.

815

816 The access to accurate information was considered crucial to increase adherence to rfMDA.
817 Thus, participants suggested more community engagement including door to door
818 sensitization, use of entertainment activities, such as theatre for sensitization, as well as the
819 inclusion of community leaders during the campaign and rfMDA implementation.

820

821 *“Community leaders should be informed to gather the population and inform them about the*
822 *malaria campaign. They should be informed about the month and day when the fieldworkers*
823 *will come to the community. People should be informed about the importance of the pills and*
824 *appeal to the population not to run away during the fieldworkers' visit. When the campaign*

825 *starts the community leaders should be informed and they should accompany the fieldworkers*
826 *because they are the ones who know the communities”* (FGD 09, general population, Motaze).

827

828 Most participants also said that they were often busy with their everyday activities, and they
829 might not be at home during the visit of the fieldworkers. So, they proposed that rFMDA
830 activities should be well planned, people and community members should be informed
831 beforehand about the day and time the fieldworkers will visit, and also, they should comply
832 with the planned day. Participants perceived that this would prevent absence of the members
833 of the household.

834

835 Almost all participants reported that it was important to give accurate information about
836 antimalarial pills in advance. They explained that people should be informed about the
837 importance of the pills, explaining its adverse effect and evaluating if some people are sick of
838 some disease contraindicated to antimalarial pills.

839

840 *“People should be told why it is important to take pills, what the pills are for, and whether the*
841 *person is sick. This is because you may meet the people while they are not sick and they may*
842 *wonder why they have to take pills if they are not sick. Then, you should explain what those*
843 *pills are for. I think that after explanation people will accept to take the pills”* (SSI 08,
844 adolescent, Magude village).

845

846 *“First, it would be better to explain what these pills are, their adverse effects: this can happen*
847 *and that, you can do this at home; advise people that if they feel ill they can go to the hospital,*
848 *etc. I think the big problem is the adverse reactions of the pills. You should explain to the*
849 *patient that it may happen, this, this, this..., that they shouldn't be alarmed, it's natural, it's the*

850 *effect of the medication, after a while it may pass, if it doesn't, they can go to hospital*” (SSI
851 06, healthcare professional, Magude village).

852

853 Some participants explained that some fieldworkers recommend drunken people to take
854 antimalarial pills, while others do not give pills to drunk people at all. These participants
855 perceived that people should not take pills after drinking alcohol, and they suggested that pills
856 should be left at the household, and people would take in the following day.

857 *“Usually, the fieldworkers arrive late and find people already drunk. But, some fieldworkers*
858 *say even if the person is drunk, they recommend him to take the pills. So, we are used to it, that*
859 *if you have just drunk, you should not take pills. We deny taking the pills after drinking”* (FGD
860 05, general population, Magude village).

861

862 *“If the person is drunk, the fieldworkers should leave the pills, and leave recommendations*
863 *with a person who is not drunk. He will take it the next day when the drunkenness is finished”*
864 (FGD 06, general population, Magude village).

865

866 Some participants suspected that not all people comply with the recommended dosage of the
867 antimalarial pills. To overcome this problem, healthcare professionals proposed supervision
868 during the administrations of the pills. They explained that the fieldworkers should visit the
869 households and monitor the compliance of malaria pills intake during the three days of dosage.

870

871 *“To comply with the dosage, I think people should take the pills in the presence of the*
872 *fieldworkers, and not let the patient decide to take it in the following days alone. He can have*
873 *a party and stop taking the pills, and he can take them when he wants. The lack of monitoring*

874 *can cut the effect of the medicine itself*' (SSI 08, healthcare professional, Magude village health
875 facility).

876

877 A considerable number of participants appealed to the improvement of fieldworkers' attitudes
878 as they perceived that fieldworkers do not often comply with the local cultural norms such as
879 greeting the members of the households, explaining the reason why they are visiting that
880 household and explaining why and how to take antimalarial pills. Participants expected humble
881 and respectful fieldworkers, and they suggested that fieldworkers should not be young people.

882

883 *"Participant 1: It is necessary that when a fieldworker arrives at a house he should greet, after*
884 *he has greeted we will give him chair to sit, and then he communicates to us about the reason*
885 *why he came to visit us, he explains to us how the pills are taken. But there are some*
886 *fieldworkers who are very young who create difficulties...they don't explain, they don't know*
887 *how to answer adult people.*

888 *Participant 3: Even if they are not young fieldworkers, some when they arrive they say: "you*
889 *have to take pills, you also have to take them here", even when someone has asthma, they say:*
890 *"you have to take, take pills. So, that's what we don't want.*

891 *Participant 5: (...) They [fieldworkers] should explain their mission well and in a good way so*
892 *that they can give us pills and we take them, in as much as we are satisfied also; they should*
893 *not prick the heart [not offend] the person, because if they prick the heart the person already*
894 *takes the pills unsatisfied*' (FGD 05, general population, Magude village).

895

896 *"Participant 1: Fieldworkers should be people with respect, they should not come with pride,*
897 *others come with their own problems and put out on me, we will not agree to each other, and*
898 *some may be sent away.*

899 *Participant 4: A fieldworker has to be someone who works with an open heart and calm, so*
900 *that we can also receive him well” (FGD 11, general population, Magude village).*

901

902 Some participants also claimed that fieldworkers were outsiders of the community. They
903 proposed training of some local fieldworkers who could understand local language, practices
904 and culture, and who would build a strong relationship with the local communities.

905

906 *“Among the fieldworkers, they should include ladies or girls from our area. These people know*
907 *the local life, it would be simple for them to greet “how are you”, have you ever felt something*
908 *“X”; they would be able to explain the local people in a good manner” (DGF 07, general*
909 *population, Mapulanguene).*

910

911 *“The rfMDA programme should involve local communities; involve someone from the*
912 *community, it would be better to train someone local that the communities know, it would*
913 *create confidence in the community, it could be a huge help. The knowledge of that person*
914 *could help them to join the campaign. Most of the time, it is not because the person does not*
915 *want to take pills, but the reason is that the fieldworkers distribute the pills and then disappear,*
916 *they have no connection with the local communities. Some people resist taking pills because of*
917 *lack of trust to the fieldworkers; because they don't know those people [fieldworkers]. The*
918 *population may think maybe the fieldworkers want to kill them; if someone dies who will they*
919 *turn to? For example, if I am a local fieldworker, I arrive at my neighbour's house, she may*
920 *even resist a bit to take pills, I try to convince her, (...) she ends up having a different idea, and*
921 *accept. She will think that my neighbour can't give me this to kill me, if she kills me I'll go to*
922 *her house (...). So, if we involve the community a little more, if local people are also into the*

923 *programme, I think it will be better, we will have a greater adherence, and the programme*
924 *goals can be achieved”* (SSI 05, healthcare professional, Panjane).

925

926 **Discussion**

927 This qualitative study analysed acceptability and perceived barriers to reactive focal mass drug
928 administration (rfMDA) among community members exposed to community engagement
929 campaigns and malaria elimination interventions in rural Magude district. The study found that
930 all group members of the community included in the sample accepted rfMDA regardless the
931 place of residence. This acceptability was associated to the awareness about rfMDA as a result
932 of community engagement campaigns. The perceptions that rfMDA, like the previous MDA,
933 would prevent malaria, improve people’s health status, and the fact that the procedures used
934 would reduce the cost incurred by transport to the health facility also influenced rfMDA
935 acceptability. Moreover, participants perceived malaria as a local health concern, and they
936 believed that rfMDA could help to eliminate it. These results are consistent with previous
937 studies in the same study setting [7,9]. In particular, these previous studies found that high
938 acceptability of MDA was influenced by the perception of malaria as a main health problem
939 [9] and by the community engagement campaign [7]. Moreover, others studies undertaken in
940 Tanzania [17], Eswatini [18] and Cambodia [19] showed that perceived risk for malaria
941 influenced acceptability of malaria treatment.

942

943 The results of this study also reveal that the procedures used in rfMDA were accepted despite
944 mixed perceptions about the process of management of pregnancy test outcomes and
945 administration of antimalarial pills to all members of the community. The acceptability of the
946 rfMDA procedures derived from the awareness of the communities that those were
947 recommended procedures to access antimalarial pills; perceptions of the procedures as norms

948 of the health facility, the willingness to know one's health status, and the recognition that
949 malaria could be hidden in the body and transmissible to other members of the community.
950 This result highlights high awareness of malaria transmission and desire of its elimination. Like
951 other studies in the Gambia [20] reported, the acceptance of antimalarial pills without malaria
952 symptoms, may reveal a strong sense of responsibility of the participants of this study toward
953 protecting themselves, their family members and their neighbours.

954

955 Despite community acceptability and high awareness of the procedures used in rfMDA, some
956 procedures such as performing malaria tests on children and pregnancy tests were not often
957 welcome, and they could hinder the uptake of rfMDA campaign. The results of this study
958 showed that some participants were reluctant to perform malaria tests to children as they
959 perceived it could harm children's health by reducing the amount of blood in their body. In
960 addition, participants were concerned about pregnancy test decision-making and pregnancy
961 testing result disclosure because it could contribute to disagreement among couples, especially
962 when a wife does a test without her husband's consultation, or if other members of the
963 community access the information about a positive pregnancy test before the husband.
964 Moreover, participants had experience of previous antimalarial pills, and they were concerned
965 about drug adverse reactions, and others were reluctant to take drugs without malaria
966 symptoms. These barriers have also been documented in previous studies [18, 21-24].
967 Furthermore, like previous studies [25] have reported, lack of access to accurate information,
968 spread of misinformation about malaria intervention, being unable to drink alcohol while
969 taking DHAp [7], lack of trust of fieldworkers, and the demand of food as precondition to take
970 DHAp are potentials barriers to rfMDA.

971

972 The barriers identified in this study reflect the need of more community engagement in malaria
973 campaign, which include the community appropriation of the malaria elimination process,
974 involvement of community leaders in the whole process, and training of local community
975 health workers and other local eligible people to serve as fieldworkers. This strategy could
976 contribute to community self-appropriation of the malaria elimination campaign, and it would
977 build a strong relationship between fieldworkers and the community. As the participants
978 suggested, local fieldworkers are more appropriate to work with communities than outsiders as
979 they are more prone to follow and respect the local cultural norms, and this could help to build
980 a strong relationship with the communities.

981

982 Community engagement is crucial, and it has been recognised as central to malaria campaign
983 uptake [26, 27]. Several strategies could be used to strengthen rfMDA, including house-to-
984 house visits to inform the population about the planned campaign, and provide non-monetary
985 incentives, such as bed nets, food or school material to children or other things that can
986 incentivise people to participate in the malaria campaign. Incentivising communities has been
987 found as a valid community engagement strategy in a similar campaign in Cambodia [27],
988 where it contributed to the increasing participation of the population in malaria campaign.

989

990 **Limitations**

991 This study is limited to the study setting and the selected participants, and the results could not
992 be generalized to other settings. Given to the nature of the qualitative methodology that guided
993 this study, the study sampling was not representative of the study population, and it was subject
994 to sample-bias because only some participants, who were considered as representing specific
995 groups of the community, were selected according to the study objectives. This sample strategy

996 led to exclusion of other community members who could have different views about the study
997 object.

998

999 **Conclusion**

1000 The community of Magude district found rfMDA and its procedures acceptable as a malaria
1001 intervention. This acceptability was associated to rfMDA awareness deriving from community
1002 engagement, previous experience of malaria similar campaigns, such as MDA, and willingness
1003 of the community to eliminate malaria. However, some barriers, such as lack of decision-
1004 making on pregnancy test among women, fear of pregnancy test results, lack of accurate
1005 information about rfMDA, fear of DHAp adverse reactions, and reluctance to take drugs
1006 without malaria symptoms might affect rfMDA campaign. Thus, there is a need to continue
1007 with community engagement and built community self-appropriation of the malaria
1008 programme. This could include involvement of local community leaders, before and during
1009 rfMDA, and local community health workers and other local people who can work as
1010 fieldworkers during rfMDA campaign. Including community's members in rfMDA
1011 implementation could optimize rfMDA uptake, and therefore contributing to malaria
1012 elimination.

1013

1014 **Supporting information**

1015 **S1A Appendix. Semi-structured interview (SSI) guide for household heads, women of**
1016 **reproductive age, adolescents, members of the general community and community**
1017 **leaders (Portuguese version)**

1018 **S1B Appendix. Semi-structured interview (SSI) guide for household heads, women of**
1019 **reproductive age, adolescents, members of the general community and community**
1020 **leaders (English Version)**

1021 **S2A Appendix. Semi-structured interview (SSI) guide for healthcare professionals and**
1022 **community health workers (Portuguese version)**

1023 **S2B Appendix. Semi-structured interview (SSI) guide for healthcare professionals and**
1024 **community health workers (English Version)**

1025 **S3A Appendix. Focus groups discussion (FGD) guide for general population: men and**
1026 **women (Portuguese version)**

1027 **S3B Appendix. Focus groups discussion (FGD) guide for general population: men and**
1028 **women (English version)**

1029 **S4 Table. Consolidated criteria for reporting qualitative studies (COREQ): 32-item**
1030 **checklist**

1031

1032 **Acknowledgement**

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1037 **References**

- 1038 1. World Health Organization. World Malaria Report 2018. Geneva: World Health
1039 Organization. 2018. [Cited 7 September 2021]. Available from:
1040 <http://apps.who.int/iris/bitstream/handle/10665/275867/9789241565653-eng.pdf>
- 1041 2. World Health Organization. World Malaria Report 2019. Geneva: World Health
1042 Organization. 2019. [Cited 7 September 2021]. Available from:
1043 <https://apps.who.int/iris/bitstream/handle/10665/330011/9789241565721-eng.pdf>
- 1044 3. Ministério da Saúde (MISAU). Plano Estratégico de Malaria 2017-2022. Maputo: MISAU.
1045 2017.
- 1046 4. Moonasar D, Maharaj R, Kunene S, Candrinho B, Saute F, Ntshalintshali N, et al. Towards
1047 malaria elimination in the MOSASWA (Mozambique, South Africa and Swaziland) region.
1048 Malar J. 2016; 15.
- 1049 5. Galatas B, Saúte F, Martí-Soler H, Nhamussua L, Simone W, et al. A multiple program for
1050 malaria elimination in southern Mozambique (the Magude project): A before-after study.
1051 PLoS ONE. 2020; 17(8): e1003227. <https://doi.org/10.1371/journal.pmed.1003227>
- 1052 6. World Health Organization, Global Malaria Programme. Global technical strategy for
1053 malaria, 2016-2030. 2015. [Cited 7 September 2021] Available from:
1054 http://www.who.int/malaria/areas/global_technical_strategy/en/
- 1055 7. Galatas B, Nhamtumbo H, Soares R, Djive H, Murato I, Simone W, et al. Community
1056 acceptability to antimalarial mass drug administration in Magude district, southern
1057 Mozambique: A mixed method study. PLoS ONE. 2021; 16(3): e0249080.
1058 <https://doi.org/10.1371/journal.pone.0249080>
- 1059 8. Aide P, Candrinho B, Galatas B, Munguambe K, Guinovart C, Luis F, et al. Setting the scene
1060 and generating evidence for malaria elimination in Southern Mozambique. Malaria Journal.
1061 2019; 18:190. <https://doi.org/10.1186/s12936-019-2832-9> PMID: 31170984.
- 1062 9. Portugaliza HP, Galatas B, Nhantumbo H, Djive H, Murato I, Saúte F, Aide P, Pell C,
1063 Muguambe K. Examining community perceptions of malaria to inform eliminations efforts in

- 1064 southern Mozambique: a qualitative study. 2019; 18: 232. [https://doi.org/10.1186/s12936-](https://doi.org/10.1186/s12936-019-2867-y)
- 1065 [019-2867-y](https://doi.org/10.1186/s12936-019-2867-y)
- 1066 10. Cirera L, Galatas B, Alonso S, Paaijmans K, Mamuquele M, Martí-Soler H, Guinovart C,
1067 Munguambe H, Luis F, Nhantubo H, et al. Moving towards malaria elimination in southern
1068 in Mozambique. Cost and cost-effective of mass drug administration combined with
1069 intensified malaria control. PLoS ONE. 2020; 15(7): e:0235631.
1070 <https://doi.org/10.1371/journal.pone.0235631>
- 1071 11. World Health Organization. Mass drug administration for falciparum malaria: a practical field
1072 manual. Geneva: World Health Organization. 2017. [Cited 7 September 2021]. Available
1073 from: <https://apps.who.int/iris/handle/10665/259367>
- 1074 12. Instituto Nacional de Estatística (INE). IV recenseamento geral da população e habitação.
1075 Censo 2017. Maputo: INE; 2020.
- 1076 13. Ministério de Administração Estatal (MAE). Perfil do Distrito de Magude. Maputo: MAE;
1077 2005.
- 1078 14. Galatas B, Nhacolo A, Marti-Soler H, Munguambe K, Jaimise E, Guinovart C, et al.
1079 Demographic and health community-based surveys to inform a malaria elimination project in
1080 Magude district, Southern Mozambique. BMJ Open. 2020; 10: e033985.
1081 <https://doi.org/10.1136/bmjopen-2019-033985>.
- 1082 15. Ndimba SD, Sidat M, Give C, Ormel H, Kok MC, Taegtmeier M. Supervision of community
1083 health workers in Mozambique: a qualitative study of factors influencing motivation and
1084 programme implementation. Human Resources for health. 2015; 13:63.
1085 <http://doi.org/10.1186/s12960-015-0063x> PMID: 26323970.
- 1086 16. Arroz JAH. Social and behaviour change communication in the fight against malaria in
1087 Mozambique. Rev Saúde Pública. 2017; 51:18. [http://doi.org/10.1590/S1518-](http://doi.org/10.1590/S1518-8787.2017051006360)
1088 [8787.2017051006360](http://doi.org/10.1590/S1518-8787.2017051006360) PMID: 28355338.
- 1089 17. Kisoka WJ, Simonsen PE, Malecela MN, Tersøl BP, Mushi DL, Meyrowitsch DW. Factors
1090 influencing drug uptake during mass drug administration for control of lymphatic filariasis in

- 1091 rural and urban Tanzania. PLoS ONE. 2014; 9(10): e109316.
1092 doi:10.1371/journal.pone.0109316
- 1093 18. Baltzell K, Maglior A, Bangu K, Mngadi N, Prach LM, Whittemore B, Ntshalintshali N,
1094 Saini M, Dlamini N, Kunene S, Hsiang MS. “We are afraid of the lion that have roared next
1095 to us”; community response to reactive focal malaria mass drug administration for malaria in
1096 Eswatini (former Swaziland). Malar J. 2019; 18:238. [https://doi.org/10.1186/s12936-019-](https://doi.org/10.1186/s12936-019-2077-9)
1097 [2077-9](https://doi.org/10.1186/s12936-019-2077-9)
- 1098 19. Pell CL, Adhikari B, Myo Thwin M, Kajeechiwa L, Nosten S, Nosten FH, et al.
1099 Community engagement, social context and coverage of mass antimalarial
1100 administration: comparative find from multi-site research in the Greater Mekong sub-
1101 Region. PLoS ONE. 2019; 14: e0214280.
- 1102 20. Jaiteh F, Masunaga Y, Okebe J, D’Alessandro U, Balen J, Bradley J, et al. Comparative
1103 perspective on treating asymptomatic infection for malaria elimination in the Gambia.
1104 Malar J. 2019; 18:39.
- 1105 21. Fehr A, Niet-Sanchez C, Muela J, Jaiteh F, Ceesay O, Maneh E, Baldeh D, Achan J,
1106 Dabira E, Cinteh B et al. From informed consent to adherence: factors influencing
1107 involvement in mass drug administration with ivermectin for malaria elimination in the
1108 Gambia. Malar J. 2021; 20:198. <http://doi.org/10.1186/s2936-021-03732-z>
- 1109 22. Dierickx S, Gryseedls C, Mwesigwa J, O’Neill S, Bannister-Tyrrell M, Ronse M, et al.
1110 factors associated with non-participation and non-adherence in direct observed mass
1111 drug administration for malaria in The Gambia. PLoS One. 2016; 11: e0148627.
- 1112 23. Dierickx S, O’Neill S, Gryseedls C, Immaculate Anyango E, Bannister-Tyrrell M,
1113 Okebe J, et al. Community sensitization and decision-making for trial participation: a
1114 mixed-methods study from the Gambia. Dev World Biorth. 2018; 18:406-19.
- 1115 24. Jaiteh F, Okebe J, Masunaga Y, D’Alessandro U, Achan J, Grietens C, de Vries D,
1116 Ribera JM, Grietens KP. Understanding adherence to reactive treatment of

- 1117 asymptomatic malaria infection in the Gambia. 2021; 11:1746.
1118 <https://doi.org/10.1038/s41598-021-81468-1>
- 1119 25. Wanzira H, Naiga S, Mlebeke R, Bukenya F, Nabukenya M, Omoding O, Echodu D,
1120 Yeka A. Community facilitators and barriers to a successful implementation of mass
1121 drug administration and indoors residual spraying for malaria prevention in Uganda: A
1122 qualitative study. *Malar J.* 2018; 17:474. <https://doi.org/10.1186/s12936-018-2624-7>
- 1123 26. Dhiman S. Are malaria elimination efforts on right track? Analysis of gains achieved
1124 and challenges ahead. *Infection diseases of poverty.* 2019; 8:14.
1125 <https://doi.org/10.1186/s40249-019-0524-x>
- 1126 27. Pell C, Tripura R, Nguon C, Cheah P, Davoeung C, Heng C, Dara L, Sareth M, Dondorp A,
1127 Seidlein L, Peto TJ. Mass anti-malarial administration in western Cambodia: a qualitative
1128 study of factors affecting coverage. *Malar J.* 2017; 17:206. DOI: 101186/s12936-017-1854-4.



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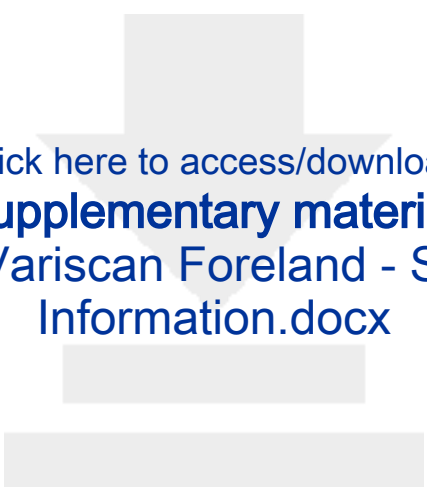
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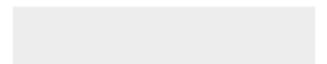
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Supporting Information

S3A Appendix. Focus groups discussion_Portuguese
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Supporting Information

S4 Table. Consolidated criteria (COREQ).docx



1 **Full title:**

2 **Acceptability and perceived barriers to reactive focal mass drug**
3 **administration in the context of a malaria elimination program in**
4 **Magude district, Southern Mozambique: A qualitative study**

5

6 **Short title:**

7 **Acceptability and barriers to reactive focal drug administration in**
8 **Mozambique**

9

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12

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22 **Abstract**

23 This study analysed acceptability and perceived barriers to reactive focal mass drug
24 administration (rfMDA) among community members exposed to community engagement
25 campaigns and malaria elimination interventions in Magude district, following mass drug
26 administration (MDA) in the same district. The study used a formative qualitative study design,
27 consisting of 56 semi-structured interviews with community members, including community
28 leaders, household heads, women of reproductive age, members of the community and
29 adolescents, 4 semi-structured interviews with community health workers, 9 semi-structured
30 interviews with healthcare professionals; and 16 focus group discussions with the -adult general
31 adult population. Data were collected between June and September 2017. A content thematic
32 analysis approach was used to analyse the data. The results of this study showed that rfMDA
33 was accepted due to awareness about the intervention, experience of a previous similar
34 programme, thesuch as MDA campaign, and due to favourable perceptions built on the believe
35 that rfMDA would help to prevent, treat and eliminate malaria in the community. Perceived
36 barriers to rfMDA include lack of access to accurate information, reluctance to take a
37 pregnancy test, concern on drug adverse reactions, and reluctance to take antimalarial drugs
38 without any symptom. In conclusion, the community found rfMDA acceptable for malaria
39 intervention. But more community engagement is needed to foster community involvement
40 and self-appropriation of the malaria programme elimination.

41
42 **Keywords:** Acceptability, Barriers, Magude, Malaria, Reactive focal mass drug
43 administration.

44

45

46

47

48 **Introduction**

49 Mozambique is one of the sub-Saharan countries that has made significant progress toward
50 malaria elimination [1,2]. However, the country is still considered one of the 6 countries with
51 the highest malaria burden in the world, contributing with ~~an estimate of~~ 4% of worldwide
52 malaria cases in 2018 [2]. Several strategies have been implemented in the country to accelerate
53 malaria elimination in southern Mozambique [3]. These strategies include increasing the
54 coverage of long-lasting insecticidal nets (LLINs), yearly rounds of universal indoors residual
55 spraying (IRS), and improvement of case management and surveillance system throughout the
56 country [3,4,5]. These strategies are ~~among parts of~~ the recommended tools of the World Health
57 Organization (WHO) Global Technical Strategy (GTS) for Malaria 2016-2030 [6].

58

59 Magude district, in particular, has been benefiting from a project led by the Manhiça Health
60 Research Centre (CISM) since 2015, which aims to eliminate malaria. The project consisted ~~in~~
61 of implementation of a comprehensive ~~mixed~~ interventions that included LLINs, IRS and
62 four rounds of mass drug administration (MDA) to all the eligible members of the population
63 of Magude between 2015 and 2017 using the half-life drug dihydroartemisinin-piperaquine
64 (DHAp) [5,7]. These interventions were implemented following different assessment and
65 baseline studies on malaria elimination in the district [8-10] that informed the perceptions of
66 the community before and during the implementation of the project.

67

68 Some factors influenced the implementation of malaria elimination interventions in Magude
69 district, including refusal of IRS and LLINs use [9], absenteeism of the household head which
70 compromised the decision-making in participation ~~in the~~ MDA campaign, and fear of DHAp
71 and ~~its~~-adverse event-reactions [7]. Notwithstanding these constraints, the implementation of

72 the comprehensive mixed intervention has resulted in a substantial reduction of malaria cases
73 in Magude district [5].

74
75 ~~Although there is significant reduction in malaria cases in the district. Despite a promising of~~
76 ~~the implemented mixed intervention in malaria case reduction, the~~ elimination of malaria ~~in~~
77 ~~the district~~ has not yet been achieved. ~~In a such case~~ Hence, the WHO recommendation ~~of~~
78 reactive epidemiological surveillance ~~as an intervention, which is an intervention~~ suitable to
79 the late stages of the fight towards malaria elimination [11]. In this context, a reactive focal
80 mass drug administration (rfMDA) was implemented in Magude district, southern
81 Mozambique, from July 2017 to January 2020 to maintain the gains and prevent an upsurge of
82 malaria transmission after MDA.

83
84 rfMDA consisted of following up all passively ~~malaria~~ detected malaria cases at health
85 facilities and community health workers to their households and administering the antimalarial
86 drug DHAp to all household~~their family~~ members and neighbours. When a household was
87 visited, the fieldworkers explained the reasons of the visit; enrolled the household members to
88 the study through informed consent forms; ~~administered~~~~administrated~~ electronic
89 questionnaires ~~to~~~~of~~ all household members gathering sociodemographic and malaria risk and
90 prevention information; evaluated each household member's eligibility to be administered
91 DHAp, which included pregnancy testing to consenting women of reproductive age and
92 malaria rapid diagnostic testing to all eligible members of the households; and administrated
93 DHAp according to each member's age. The administration of DHAp followed the same
94 procedures used in MDA in the same district [8,5,7]. The implementation of rfMDA strategy
95 was complemented by a community engagement campaign encouraging~~incentivising~~ the

96 population to seek healthcare upon the presentation of fever and to adhere to thise reactive
97 surveillance intervention.

98
99 This study analysed acceptability and perceived barriers to reactive focal mass drug
100 administration (rfMDA) among community members exposed to community engagement
101 campaigns and malaria elimination interventions ~~such as healthcare providers, community~~
102 ~~health workers, community leaders, women of reproductive age, adolescents and general~~
103 ~~members of the community~~ in Magude district.

104

105 **Methods**

106 **Study setting**

107 The study was carried out in ~~the~~ rural district of Magude, ~~district~~ located in the northwest of
108 Maputo province, southern Mozambique. In 2017, the national statistics institute's (INE)
109 census counted the district has 63,691 inhabitants and 14,583 households in the district [12].
110 distributed in 5 Administrative Posts: Magude village, Motaze, Mahele, Panjane and
111 Mapulanguene [13], and the study covered all these 5 Administrative Posts. There are 9 rural
112 health facilities, 1 referral health centre and 27 community health workers (CHWs) throughout
113 the district [14]. CHWs provide diagnosis and treatment of malaria and other diseases, such as
114 diarrhoea, pneumonia and refer patients with signs of sickness requiring high medical attention
115 [15]. Both health providers and community health workers engage in community sensitization
116 about malaria using a social behaviour change communication approach ~~of~~ included in the Plan
117 of the National Malaria Control Program (NMCP) [16]. The level of malaria in the district ~~is~~
118 was considered moderate before de elimination program, with about 200 cases per 1000 prior
119 to MDA [14]. The district has been exposed to malaria prevention strategies, such as malaria

120 case management using artemether-lumefantrine, vector control, IRS and the population has
121 been exposed to several malaria research activities before and after the Magude project [5,8].
122

123

124 **Study design**

125 ~~This~~A formative qualitative study assessed acceptability and perceived barriers to the reactive
126 surveillance strategy rfMDA among community members exposed to community engagement
127 campaigns and malaria elimination interventions. The study was undertaken between June
128 ~~and~~ September 2017, and it initiated before the start of the reactive surveillance intervention
129 and continued during the first two months after the start of the intervention in July 2017.
130

131

131 **Sample strategy and sample size**

132 A purposive sampling was performed to select individual members representing different
133 groups in the community. These groups included adult household heads (≥ 18 years old), adult
134 women of reproductive age (18-49 years old), female adolescents (12-17 years old), adult
135 members of the community (≥ 18 years old) and community leaders (≥ 18 years old). The same
136 strategy was used to select adult general population (≥ 18 years old) who composed focus group
137 discussions (FGD). These participants were selected to capture the view and the lay
138 perspective, as well as mapping the barriers with regards to reactive focal mass drug
139 administration. A total of 69 participants of different community groups, comprising individual
140 semi-structured interviews, and 157 participants of the general population, who participated in
141 FGDs, were included in the study (Table 1).
142

143 Table 1. Study sample size

Study setting	Individual semi-structured interviews								FGDs (n=16) with general population		
	Household head	Women of Reproductive age	Adolescent	Member of the community	Community leader	Health professionals	CHWs	Total	Men	Women	Total
Magude village	1	1	5	6	6	5	1	25	8	37	45
Motaze	4	3	2	4	0	0	0	13	1	16	17
Mahele	1	3	0	0	1	2	0	7	13	20	33
Panjane	2	1	2	5	2	1	2	15	7	11	18
Mapulangwen	1	2	0	3	1	1	1	9	16	28	44
Total	9	10	9	18	10	9	4	69	45	112	157

144

145

146 The study also included healthcare providers who were engaged in malaria campaigns and
147 malaria elimination interventions. A purposive sampling was used to select 9 healthcare
148 professionals and 4 CHWs in all the study settings (Table 1). Health professionals were
149 working in the health facilities located in the same communities where the study took place.
150 The community health workers also worked in the same communities in coordination with
151 the local health facilities.

152
153 The study sample size did not cover all participants in all study sites due to unequal distribution of the
154 study participants' categories and several constraints to accessing the eligible participants. Health
155 professionals and CHWs were not included in some study sites because they were not in all selected
156 communities, and some community leaders were absent during the data collection. Additionally, it
157 was not possible to include adolescents from Mahele and Mapulanguene because the study took place
158 during the school season, and the eligible participants were at schools in different districts.
159 Furthermore, members of the community from Mahele were not included in the sample of semi-
160 structured interviews because they were unavailable due to their agricultural activities. In addition, the
161 lack of accessibility at the selected study sites during the rainy season constrained access to the
162 eligible participants.

163

164 **Data collection**

165 Semi-structured interviews (SSI) and focus group discussions (FGDs) were used to collect
166 data. Individual SSI were administered to household heads, women of reproductive age,
167 adolescents, members of the community, community leaders, healthcare professionals and
168 community health workers; while FGDs were used to collect data ~~with-from the~~ adult general
169 population. The size of each FGD varied between 8 and 12 members, and each FGD lasted
170 between 60 and 80 minutes. Data collection guides for both SSI and FGDs were designed to
171 capture perceptions of rfMDA, acceptability of the procedures of rfMDA and the reasons for

172 its acceptability, and barriers that could emerge during the implementation of rfMDA. Guides
173 were prepared in Portuguese, and a pilot test was performed in the local language Changana
174 before the beginning of data collection. Based on the pilot test, the guides were refined. SSI
175 were conducted in both Portuguese and Changana, depending on the language preference of
176 the participants, while all FGDs were conducted in Changana. The interviewers, who are fluent
177 in Portuguese and Changana, were trained to conduct SSI and facilitate FGDs. All interviews
178 and FGDs were digitally recorded, and later independently transcribed in Portuguese. The
179 research team controlled the quality and accuracy of the transcriptions.

180

181 **Data analysis tools**

182 A content thematic analysis approach was used to analyse the data of SSI and FGD. First, data
183 management was conducted using Nvivo 12 (QRS International Pty. Ltd.), a qualitative
184 package for qualitative data analysis, following designed generic outline nodes representing
185 the coding structure. Themes and subthemes emerging from the data were critically discussed
186 until a consensus of the researchers was ~~reached~~researched. The final themes were: awareness
187 and acceptability of reactive focal mass drug administration, acceptability of the procedures
188 used in ~~reactive focal mass drug administration strategy~~rfMDA and barriers to ~~reactive focal~~
189 ~~mass drug administration strategy~~rfMDA.

190

191 **Ethical considerations**

192 The study was approved by CISM's institutional ethics committee (CIBS-CISM) and the
193 Mozambican Ministry of Health National Bioethics Committee, and it was registered as
194 protocol number Ref:146/2017. All participants received detailed information about the study
195 objectives. A written informed consent was obtained from all participants prior their
196 participation in the study. The study obtained a written informed consent from all parents or

197 guardians of the young adolescents (12-17 years old) included in the study.
 198 ~~Moreover~~Additionally, an assent was sought from all young adolescents that participated in
 199 this study. Participants were assured about their anonymity and confidentiality throughout the
 200 research process. Thus, all participants names were not recorded, and all informed consents,
 201 digital records and databases were securely stored at a secure server of CISM.

205 Results

206 The participants of this study included different community groups, general population of the
 207 community, healthcare professionals and community health workers. Table 2 and Table 3
 208 summarise the characteristics of participants per community group and among the general
 209 population who participated in semi-structured interviews and in focus group discussion
 210 respectively. The majority of participants were married or living with a partner, had primary
 211 school and worked as famers.

213 Table 2. Sociodemographic characteristics of participants per community group

Variables	Community leaders (n=10)	Household head (n=9)	Women—of reproductive age (n=10)	Adolescents (n=9)	Members of the community (n=18)
Sex	-	-	-	-	-
Male	100% (10/10)	77,8% (7/9)	0 (0/10)	0 (0/9)	16,7% (3/18)
Female	0 (0/10)	22,2% (2/9)	100% (10/10)	100% (9/9)	83,3% (15/18)
Educational level	-	-	-	-	-
None	10% (1/10)	33,3% (3/9)	10% (1/10)	0 (0/9)	11,1% (2/18)
Primary school	90% (9/10)	66,7% (6/9)	60% (6/10)	77,8% (7/9)	88,9% (16/18)

Secondary Education	0 (0/10)	0 (0/9)	30% (3/10)	22,2% (2/9)	0 (0/18)
Marital Status	-	-	-	-	-
Single	0 (0/10)	0 (0/9)	30% (3/10)	77,8% (7/9)	5,6% (1/18)
Married or living with a partner	90% (9/10)	100% (9/9)	70% (7/10)	22,2% (2/9)	94,4% (17/18)
Widowhood	10% (1/10)	0 (0/9)	0 (0/10)	0 (0/9)	0 (0/18)
Occupation	-	-	-	-	-
Farmer	100% (10/10)	77,8% (7/9)	80% (8/10)	22,2% (2/9)	77,8% (14/18)
Salesperson	0 (0/10)	11,1% (1/9)	0 (0/10)	0 (0/9)	5,6% (1/18)
Security	0 (0/10)	11,1% (1/9)	0 (0/10)	0 (0/9)	0 (0/18)
Housewife	0 (0/10)	0 (0/9)	10% (1/10)	11,1% (1/9)	11,1% (2/18)
Traditional healer	0 (0/10)	0 (0/9)	0 (0/10)	0 (0/9)	5,6% (1/18)
Student	0 (0/10)	0 (0/9)	10% (1/10)	66,7% (6/9)	0 (0/18)
Religion	-	-	-	-	-
Atheism	10% (1/10)	22,2% (2/9)	10% (1/10)	0 (0/9)	0 (0/18)
Christianity	90% (9/10)	77,8% (7/9)	90% (9/10)	100% (9/9)	88,9% (16/18)
Animism	0 (0/10)	0 (0/9)	0 (0/10)	0 (0/9)	11,1% (2/18)
<u>Characteristics/Variables of participants</u>	Community leaders (n=10) n(%)	Household head (n=9) n(%)	Women of reproductive age (n=10) n(%)	Adolescents (n=9) n/%	Members of the community (n=18) n(%)
Sex					
Male	10 (100)	7 (77.8)	0 (0)	0 (0)	3 (16.7)
Female	0 (0)	2 (22.2)	10 (100)	9 (100)	15 (83.3)
Educational level					
None	1 (10)	3 (33.3)	1 (10)	0 (0)	2 (11.1)
Primary school	9 (90)	6 (66.7)	6 (60)	7 (77.8)	16 (88.9)

Secondary Education	0 (0)	0 (0)	3 (30)	2 (22.2)	0 (0)
Marital Status					
Single	0 (0)	0 (0)	3 (30)	7 (77.8)	1 (5.6)
Married or living with a partner	9 (90)	9 (100)	7 (70)	2 (22.2)	17 (94.4)
Widowhood	1 (10)	0 (0)	0 (0)	0 (0)	0 (0)
Occupation					
Farmer	10 (100)	7 (77.8)	8 (80)	2 (22.2)	14 (77.8)
Salesperson	0 (0)	1 (11.1)	0 (0)	0 (0)	1 (5.6)
Security	0 (0)	1 (11.1)	0 (0)	0 (0)	0 (0)
Housewife	0 (0)	0 (0)	1 (10)	1 (11.1)	2 (11.1)
Traditional healer	0 (0)	0 (0)	0 (0)	0 (0)	1 (5.6)
Student	0 (0)	0 (0)	1 (10)	6 (66.7)	0 (0)
Religion					
Atheism	1 (10)	2 (22.2)	1 (10)	0 (0)	0 (0)
Christianity	9 (90)	7 (77.8)	9 (90)	9 (9)	16 (88.9)
Animism	0 (0)	0 (0)	0 (0)	0 (0)	2 (11.1)

214

215 Table 3. Sociodemographic characteristics of focus group discussion participants

Variables	Frequency	%
Sex	-	-
Male	45	28,7
Female	112	71,3
Education-level	-	-
None	51	32,5

Primary	87	55,4
Secondary	19	12,1
Marital Status	-	-
Single	21	13,4
Married or living with a partner	118	75,2
Widow/Widower	18	11,5
Occupation	-	-
Farmer	123	78,3
Labourer	14	8,9
Salesperson	7	4,5
Housewife	5	3,2
Students	3	1,9
Traditional healer	5	3,2
Religion	-	-
Atheism	24	15,3
Christian	125	79,6
Animist	8	5,1
Characteristics of participants	Frequency	%
Sex		
Male	45	28.7
Female	112	71.3
Education level		
None	51	32.5
Primary	87	55.4

Secondary	19	12.1
Marital Status		
Single	21	13.4
Married or living with a partner	118	75.2
Widow/Widower	18	11.5
Occupation		
Farmer	123	78.3
Labourer	14	8.9
Salesperson	7	4.5
Housewife	5	3.2
Students	3	1.9
Traditional healer	5	3.2
Religion		
Atheism	24	15.3
Christian	125	79.6
Animist	8	5.1

216

217 Table 4 presents the characteristics of healthcare professionals and community health workers. The
 218 majority of participants had secondary school. Almost all healthcare professionals had specialised
 219 training in primary healthcare and working as maternal and child health nursing, general nursing,
 220 technician of preventive medicine and assistant of service, while community health workers had not
 221 any specialised training.

222

223

224 Table 4. Sociodemographic characteristics of healthcare professionals and community health

225 workers

226

<u>Characteristics of participants</u> <u>Variables</u>	Healthcare professionals (n=9) n(%)	Community health workers (n=4) n(%)
Sex		
Male	4 (44.4)	2 (50)
Female	5 (55.6)	2 (50)
Education level		
Primary	0 (0)	3 (75)
Secondary	8 (88.9)	1 (25)
High Education	1 (11.1)	0 (0)
Marital Status		
Single	6 (66.7)	0 (0)
Married/living with a partner	3 (33.3)	3 (75)
Widow	0 (0)	1 (25)
Religion		
Atheism	1 (11.1)	1 (25)
Christian	8 (88.9)	3 (75)
<i>Figure 1</i> Variables	Healthcare professionals (n=9)	Community health workers (n=4)
-Sex	-	-

Male	44,4% (4/9)	50% (2/4)
Female	55,6% (5/9)	50% (2/2)
Education level	-	-
Primary	0 (0/9)	75% (3/4)
Secondary	88,9% (8/9)	25% (1/4)
High Education	11,1% (1/9)	0 (0/4)
Marital Status	-	-
Single	66,7% (6/9)	0 (0/4)
Married/living with a partner	33,3% (3/9)	75% (3/4)
Widow	0 (0/9)	25% (1/4)
Religion	-	-
Atheism	11,1% (1/9)	25% (1/4)
Christian	88,9% (8/9)	75% (3/4)

227

228

229 Awareness and acceptability of reactive focal mass drug 230 administration

231 Awareness of reactive focal mass drug administration

232 Most participants of this study were aware about the rfMDA programme that was taking place
233 in the community, and they had participated in the previous MDA campaign. Participants
234 received information about rfMDA from community leaders, community meetings, radio,
235 fieldworkers, neighbours and healthcare professionals after visiting a health facility and testing
236 being teste for malaria. ~~Few participants said that they only knew about rfMDA when their~~

237 ~~parents were tested malaria at the health facility or when a fieldworker visited the household~~
238 ~~to test malaria to all members of the family.~~

239
240 ~~“Researcher: Where did you hear or how did you get information about the malaria tablets~~
241 ~~programme?”~~

242 ~~Participant 2: We only saw people arriving in my house saying that they are coming to give~~
243 ~~pills. The name of the person who was sick with malaria was found [at the health centre], then~~
244 ~~they came to ask 'where is the house of person X', then people indicated, 'it is there'.~~

245 ~~Researcher: Didn't you get information from the secretaries of the districts?~~

246 ~~Multiple participants: [Voices overlapping]: No.~~

247 ~~Researcher: Were you surprised?~~

248 ~~Participant 2: Yes. They were asking, “where is the house of person X?”~~

249 ~~Participant 1: In my house they just arrived and came in by surprise.~~

250 ~~Participant 4: Me too, I was not told by the secretary, I just saw people entering in my house,~~
251 ~~asking "person X's house where is it?". I said it's here" (FGD 15, general population, Motaze).~~

252
253 All participants of different community groups ~~of the community~~ said that the objective of
254 rfMDA was to treat, cure and eliminate malaria. They viewed rfMDA as important to their
255 families and communities because it helped to diagnose, treat and prevent malaria, which they
256 perceived as a problem in the community. Additionally, ~~p~~Participants also perceived that since
257 the beginning of MDA and rfMDA programmes, their health status had improved, malaria
258 cases had decreased, and they believed that these programmes cured malaria. ~~Some~~ One of the
259 participants said:

260
261

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262 ~~“It is very important. I have a child who never stayed two months without going to hospital~~
263 ~~because of malaria, but since they started distributing pills, he no longer suffers from malaria,~~
264 ~~even if he has a fever, I run to the hospital, they give him pills and the fever disappears” (FGD~~
265 ~~15, general population, Motaze).~~

266
267 “I think it is good because before this project [rfMDA] started, when my son and I got sick, I
268 knew beforehand that the other one would also get sick quickly, so I had to get money urgently
269 and go back to the hospital, but since the distribution of the pills, my children and I have not
270 got sick until today” (FGD 04, general population, Mahele).

271
272 Most participants had ~~an~~ experienced ~~d about the~~ rfMDA program, and they said that it consisted
273 of diagnosing, treatment and prevention ~~home treatment included of~~ all members of the family,
274 ~~as one of the . Only some participants had not experience of rfMDA. Those who had experience~~
275 ~~viewed rfMDA as important because the diagnosis, treatment and prevention included all~~
276 ~~members of the family. Some participants expressed their his opinion as follows as follows:~~

277
278 ~~“It happened to me, I went to hospital when I was very sick with malaria, I arrived and they~~
279 ~~did a malaria test and it showed malaria. They sent the fieldworkers the next day at 8 o'clock~~
280 ~~and when they arrived here at home, they treated me, they treated all people here at home, so~~
281 ~~that they would be prepared, so that the malaria that I had wouldn't contaminate them. I felt~~
282 ~~very good because they helped me with this disease that I had. They came to my house to treat~~
283 ~~me, from then on, I took the pills that I was given until then I feel very well, I still haven't fallen~~
284 ~~ill with malaria” (SSI 07, member of the community, Mapulanguene).~~

285
286

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287 “Even myself I got sick with malaria, they came in my house to test, no one else was diagnosed
288 with malaria, but everyone was given pills even without having malaria. They didn't give me
289 more pills because I was taking pills” (FGD 15, general population, Motaze).

290

291 **Acceptability of malaria reactive focal mass administration**

292 All participants of different groups of the community ~~_with or without experience,~~ regardless
293 their place of residence, accepted and welcomed the rfMDA programme because they
294 perceived that it saved people from dying from malaria, eliminated malaria in the community
295 and prevented malaria and helped to improve their health status. Some participants expressed
296 their views as it follows. Moreover, participants perceived that the programme saved people to
297 die from malaria and it eliminated malaria in the community.

298

299 “The community accepts [rfMDA] because they are seeing that they have no other way to
300 prevent the outbreak of malaria or eliminate malaria because malaria kills. It is imperative
301 that they accept and comply with the recommendations so that we can eliminate malaria” (FGD
302 01, general population, Panjane).

303

304 “I accept because I see that the fieldworkers follow us from hospital to our homes because of
305 this malaria disease. When they do follow up it allows everyone to be diagnosed, including
306 those who do not like to go to hospital, and so one can fight and eliminate this disease
307 [malaria]” (FGD 09, general population, Motaze).

308

309 Furthermore, all participants accepted rfMDA because it is based on home treatment, which
310 reduced the cost of transport to the health facility, and helped people who are lazy to go to the
311 health facility when they have malaria symptoms and those who live far from the health facility.

312 However, some participants accepted rfMDA because they were following norms from the
313 health facility, and they perceived that if they do not accept malaria treatment, they might
314 experience difficulties in the future malaria treatment at the health facility.-

315

316 *“Researcher: Thank you very much. Do you think it is important that we distribute pills in the*
317 *districts?*

318 *Participant: It is very important, it helps us with diseases, even the persons who are lazy to go*
319 *to the hospital when they have malaria symptoms, they end up taking it, because the pills go to*
320 *their house” (SSI 03, community leader, Magude village).*

321

322

323 *“Maybe I could be sick and I would have to go to hospital, but I might not have money. I could*
324 *borrow money to go to hospital but this programme [rfMDA] helps because the fieldworkers*
325 *come to my house; this is very good because I no longer have to spend money to go to hospital.*
326 *The fieldworkers do complete and better work” (FGD 04, general population, Mahele).*

327

328 *“Here in Mapulanguene, this activity of following up people to their homes when a person is*
329 *sick is very important because there are people who cannot walk and cannot go to the hospital*
330 *because there is no transport. If these people get sick, the solution is to transport them in a*
331 *hand truck to the hospital. But now the fieldworkers are able to go directly to the homes of*
332 *these people to diagnose and treat them. In my opinion, I see that the population is satisfied*
333 *with this type of treatment” (SSI 10, community leader, Mapulanguene).*

334 *Some participants said that they accepted rfMDA because they were following norms from the*
335 *health facility. They also perceived that if they do not accept malaria treatment, they might*

336 ~~experience difficulties in the future malaria treatment at the health facility. One of the~~
337 ~~participants presented his view as follows;~~

338

339 “Haaa... we accept because those are the norms and you must comply with. If you don't accept
340 to be cured, when you go to hospital (...) while you have malaria, they [healthcare
341 professionals] will say that you are not sick with malaria because you didn't accept this
342 treatment [rfMDA]. They will say that you are happy when people die in the community, and
343 that when you get malaria you will contaminate everyone. So, we accept that when one person
344 from the household gets sick, the fieldworkers come to test the rest of the household members
345 so that everyone is protected” (FGD 01, general population, Panjane).

346

347 Almost all participants of different members of the community assumed that everybody would
348 accept to participate in the rfMDA programme because most people were aware of the severity
349 of malaria including its death consequences, and also because they had experience of the
350 benefits of the previous similar campaign against malaria (MDA). They also added that most
351 people were aware that they had common consensus regarding malaria. This consensus
352 consisted on the idea that malaria was a problem of all members of the community, and
353 therefore, they had to fight against it; and they viewed rfMDA programme as a vehicle which
354 helps to eliminate it.-

355

356 “Everybody will adhere to the programme because uhm, malaria kills. And at that time before
357 these pills existed others died because of this disease (...). Because what happens is that when
358 people get malaria today, tomorrow they wake up well, it attacks them the day after tomorrow,
359 the next day they wake up well, when malaria is rising and then it gets to the point that they
360 don't even wake up and then go to hospital when it has risen, the person is already losing his

361 *life by then. But soon after those pills arrived, we escaped, I still haven't heard that anyone has*
362 *died of malaria now, since we have been taking those pills. Now even if they go around the*
363 *houses giving us pills there is no one who will deny; people will accept” (FGD 09, general*
364 *population, Motaze).*

366 ~~The experience with previous similar campaigns and the awareness of similar programs were~~
367 ~~emphasized by one community leader who mentioned that people would participate in the~~
368 ~~rFDA because they are familiar to this kind of campaigns and its benefits in preventing~~
369 ~~malaria as well as avoiding the travelling to the health facility due to malaria.~~

371 ~~“People have been already informed about program alike this in the past. Since this help of~~
372 ~~distributing malaria pills started [MDA], people are often informed about it. I don't think they~~
373 ~~can refuse to participate because since we started to take these pills people no longer frequently~~
374 ~~go to the hospital due to malaria” (SSI 08, community leader, Magude village).~~

376 ~~Some participants also said that most people were aware that they had common consensus~~
377 ~~regarding malaria. This consensus consisted on the idea that malaria was a problem of all~~
378 ~~members of the community, and therefore, they had to fight against it, and they viewed rFDA~~
379 ~~programme as a vehicle which helps to eliminate it.~~

381 ~~“People will accept the program because we all have the same problem, which is malaria, and~~
382 ~~we have been struggling to fight against this disease” (SSI 05, household head, Motaze).~~

383

384 **Acceptability of the procedures used in reactive focal mass drug**
385 **administration**

386 The ~~procedures of~~rfMDA consisted of following up all patients tested for malaria at the health
387 facility or by community health workers. Fieldworkers followed the patients to their homes,
388 performed malaria and pregnancy tests, and treated all eligible household members and the
389 surrounding neighbours. This theme analyses community acceptability of these procedures.

390

391 **From health facility to home treatment**

392 All participants accepted and welcomed the procedure of following up patients from the health
393 facility to their homes. Participants perceived that this procedure would prevent high transport
394 costs from home to the health facility, it would enable them to know the number of people
395 infected by malaria at the household, and it could contribute to eliminate malaria and prevent
396 death from it. Moreover, some participants perceived that a visit from the health facility showed
397 an interest of the healthcare professionals about patients that tested positive to malaria. The
398 following exerts present participants' views who had experience of rfMDA.

399

400

401 *“We received fieldworker from the health facility because we want to know if there is someone*
402 *else here at home with malaria, or is it just that person who we took to the hospital and tested*
403 *malaria” (FGD 10, general population, Magude village).*

404

405 *“We used to die a lot from malaria, because when the person was shaking and could not go to*
406 *hospital, and ended up dying inside the house (...) because many people do not have*
407 *possibilities to take the sick person to hospital. Now, treating the disease [malaria] at home,*

408 *this will decrease malaria and avoid deaths from malaria”* (FGD 09, general population,
409 Motaze).

410

411 ~~Moreover, some participants perceived that a visit from the health facility showed an interest~~
412 ~~of the healthcare professionals about patients that tested positive to malaria. The following~~
413 ~~excerpt presents participants’ views who had experience of rMMA.~~

414

415 *“Participant 2: [Fieldworkers] came to my house because I went to the hospital and tested for*
416 *malaria. They came to my house to visit me. They said they were going to visit other people*
417 *who had also been diagnosed with malaria in hospital. So, they visited me up to two to three*
418 *times. I thank them for the visit since they are visiting me, they want to know if I am better or*
419 *not.*

420 *Participant 5: They are good visits, because they are visiting us after we go to the hospital to*
421 *know how we are doing, it is good like this when healthcare professionals visit us”* (FGD 05,
422 general population, Magude village).

423

424 Healthcare professionals, in particular, hypothesized that communities would accept receiving
425 fieldworkers from the health facility because the procedure will prevent many patients ~~to from~~
426 ~~having to~~ go to the health facility, where they often spend a long time to be treated or attended.

427

428 ~~“[The procedure] is positive, because in addition to reducing mortality, it also reduces the~~
429 ~~number of patients in the hospital; because the person goes and arrives and stays a long time,~~
430 ~~he/she has to go to the consultation, from the consultation they are sent to the laboratory, from~~
431 ~~the laboratory they have to go back again for the consultation, and it's not one and the same~~

432 ~~person. So, I think it is one of the reasons why the community accept this procedure” (SSI 09,~~
433 ~~healthcare professional, Magude village health facility).~~

434

435 In addition, some healthcare professionals viewed the procedure as an opportunity to visit
436 communities; and a such visiting could represent the commitment of the healthcare
437 professionals with the communities and it could strengthen the relationship between ~~the~~
438 ~~healthcare professionals and communities~~them; while others perceived it as an opportunity to
439 identify other patients who could have malaria symptoms and monitor those who have already
440 tested positive to malaria.-

441 *“It is a welcome activity because, firstly, when they receive a visit from healthcare*
442 *professionals, the community feel valued because they know the healthcare professionals go*
443 *out from the health units to the community to find out about the health situation of that*
444 *community. For the communities, the visit shows some interest of healthcare professionals to*
445 *the community. First, we gain that trust with our community as an institution and second, I can*
446 *say that we manage to detect the possible cases [of malaria] that may be emerging and at some*
447 *points hidden in the community”* (SSI 04, healthcare professional, Mahele health facility).

448

449

450 ~~“(…) the strategy is welcome, it is very welcome, because it will help to eliminate malaria in~~
451 ~~the community. The strategy also benefits the Ministry of Health because with the elimination~~
452 ~~of malaria, the ministry will focus on other diseases”~~ (SSI 05, healthcare professional, Panjane
453 ~~health facility).~~

454

455 ~~Other healthcare professionals said that following patients from the health facility to their~~
456 ~~homes would also enable to identify other members who could have malaria symptoms and~~
457 ~~monitor those who have already tested positive to malaria.~~

458
459 *“Following participants who test positive for malaria is a good activity, because when we go*
460 *to the house, after we have tested a member, we can see if that member who tested positive for*
461 *malaria is or is not complying with the medication. But, also at home there might be another*
462 *member with malaria, so when we go there [in the household], we test, we will know how many*
463 *people have malaria”* (SSI 05, healthcare professional, Mapulanguene health facility).

464

465 **Acceptability of malaria testing at home**

466 Most participants accepted to be tested for malaria at home because they perceived that testing
467 was a way of diagnosing malaria, which ~~most a lot~~ of the times can ~~be be hidden in the~~
468 ~~body~~ asymptomatic. In addition, participants said that the home testing enabled to diagnose
469 other diseases that people might not know.

470 *“I accept to do the test because when someone appears who was bitten by mosquitoes, they go*
471 *to the hospital, then they are able to follow up on that case, they go to the house of the person*
472 *who was detected with malaria, test the people from home, medicate so that they don't get sick.*
473 *They do that because that person who was detected malaria and it can be the case that the*
474 *mosquito contaminates the other people, but there can also be people with malaria in that*
475 *household who have not yet gone to the hospital”* (SSI 05, household head, Motaze).

476

477
478 ~~“I am happy with the test because they discover many other diseases. Before they started this~~
479 ~~work, it was difficult to manage diseases, we did not know where to turn, what to do with them,~~

480 ~~*but nowadays we know. We are healthy. If I happen to discover an illness that has nothing to*~~
481 ~~*do with these pills, they advise me to go to the hospital to get the right medication. I leave and*~~
482 ~~*go to the hospital and there they give me pills that correspond to the disease I have. I see it as*~~
483 ~~*something good” (FGD 04, general population, Mahele).*~~
484

485 Some participants also perceived that testing was the only guarantee to know their health status
486 and to comply with the prescribed medication. They said that they wished to be tested to know
487 if they had malaria or not, and only thereafter they would be sure about the disease they are
488 suffering from and take the prescribed pills.

489
490 *“If the fieldworkers come to my house and they don't test me, I don't feel happy. I want them to*
491 *test me until they tell us that we don't have malaria, only then will we feel happy, because even*
492 *if you go to the hospital and then arrive with the child when he is sick, if they don't test him*
493 *and then take any pills and give to him without testing him, he won't feel comfortable. If the*
494 *child takes the pills and the next day he doesn't get better, he will say that it is because they*
495 *didn't do any analysis, maybe it's malaria, you don't feel happy” (FGD 09, general population,*
496 *Motaze).*

497

498 **Acceptability of including neighbours in malaria treatment**

499 Participants were asked if they would accept malaria treatment after their neighbours were
500 tested positive to malaria. All participants said that they would accepted malaria treatment if
501 their neighbours tested positive to malaria, even if none of their household members was tested
502 positive to malaria. This acceptability derived from the fact that participants perceived that
503 malaria was transmissible, and for that reason, including neighbours in malaria treatment would
504 prevent others from getting the disease.

505

506 *“Participant 3: I accept because I will not only prevent the people in my house, but also the*
507 *neighbours (...). This activity of fighting malaria, eliminating malaria from neighbour to*
508 *neighbour is good because we will all be free from malaria.*

509 *Participant 1: In my opinion, I see that it is very good when the fieldworkers come to test me*
510 *for malaria and also test the people at home and the neighbours, because it may happen that*
511 *the mosquito that bit me comes back to bite the people here at home and the neighbours. The*
512 *mosquito can enter in the house of the immediate neighbours.*

513 *Participant 5: Once I have been infected with malaria it may happen that the neighbours are*
514 *also infected because the mosquito bites here, comes out and bites the neighbours. I see these*
515 *activities are very important to prevent malaria” (FGD 13, general population,*
516 *Mapulanguene).*

517

518

519

520 **Acceptability of pregnancy testing at home**

521 All participants of different groups said that they would accept pregnancy testing at home.
522 Most participants were aware that a pregnant woman should not take malaria pills. In addition,
523 participants said that most women of reproductive age might not know if they are pregnant or
524 not, and the test would help to disclose the status of the women before administration of the
525 pills.

526

527 *“Participant 3: We accept the pregnancy test because the fieldworker will be following the*
528 *norm "that you cannot give pills if I am pregnant, it may happen that I say I am not pregnant,*
529 *while I am, I want to undo the pregnancy to relieve myself". So, I don't see a problem in this*

530 *issue of taking pregnancy test to know if you are pregnant or not. Also, even if the person has*
531 *not spoken, it is necessary that they first be tested to know if they are pregnant or not, because*
532 *it can happen that they say they are not, while they are, they give pills and the pregnancy*
533 *undoes itself.*

534 *Participant 5: In a household there can be girls, one of them can be pregnant and no one in*
535 *the house knows, she got pregnant and so on, it's not official [refers to a pregnancy contracted*
536 *from a man not known to the family members and who has not gone through some ceremony*
537 *of making the relationship official] so, no, the culprit will not be the fieldworker, because they*
538 *also did not know of the existence of the pregnancy.*

539 *Participant 7: It is also not correct that a girl is pregnant and takes the pills. If the girl is*
540 *pregnant and after taking the pills the pregnancy falls apart, it would be the fault of the*
541 *fieldworker” (FGD 15, general population, Motaze).*

542

543 Both women of reproductive age and adolescents accepted to be tested, and they also knew the
544 importance of pregnancy test before the administration of the malaria pills. They ~~said~~ believed
545 that if a pregnant woman took the malaria pills she could suffer abortion. They perceived the
546 pregnancy test as a way of preventing abortion. In addition, some women of reproductive age
547 and members of the community said that they were “pleased” to undergo a pregnancy test
548 because it enabled them to uncover the pregnancy.

549

550 *“We do pregnancy tests for women because it can happen that they give pills while she is not*
551 *well, if they give pills while she is pregnant, she can have complications or lose that pregnancy*
552 *here at home, the fieldworker who gave the pills will be guilty” (...)* (SSI 05, woman of
553 reproductive age, Motaze).

554

555 ~~“They do the pregnancy test because of the malaria tablets. If they find me while I am pregnant,~~
556 ~~after being tested, if I take those pills, they can cause an abortion. The test is for the~~
557 ~~fieldworkers to be sure that the person is not pregnant because there are people who don't even~~
558 ~~know if they are pregnant or not” (SSI 08, adolescent, Magude village).~~

559

560

561 ~~In addition, some women of reproductive age and members of the community said that they~~
562 ~~were “pleased” to performance pregnancy test because it enabled them to discovery the~~
563 ~~pregnancy.~~

564

565 “The test is very good because you can be pregnant without knowing. The first time I was tested
566 I was breastfeeding my baby and I didn't know that I was already pregnant. When they did the
567 test, they found out that I was pregnant, but I didn't even know, they did me a big favour because
568 even my husband didn't know; the pregnancy was hidden, the child was sucking dirt (...). If it
569 hadn't been for the test, I would only realise that I was not well when the belly was already big,
570 so the test was very important” (SS 02, woman, member of the community, Magude village).

571

572 Moreover, household heads, both women and men, and community leaders mentioned that they
573 accepted pregnancy test to their wives and female adolescent as they acknowledged that they
574 might not know if they were pregnant or not. In addition, they viewed a pregnancy test as
575 “good” because it helped to ~~diagnose-uncover~~ several diseases, and it enabled pregnant women
576 to seek the health facility early on for treatment and follow-up of the pregnancy.

577

578 “The pregnancy test is important because if the person is tested they [fieldworkers] can find many other
579 diseases; if they find diseases, the doctors will treat those diseases that she has. The person is tested
580 because it may happen that she is pregnant while she has malaria, the child may get it from inside the

581 *mother [in pregnancy]. When the woman is tested, various diseases will manifest then, so that both*
582 *mother and child will be treated” (SSI 10, household head, Motaze).*

583

584 *“Participant 1: When they test us and find out that we are not pregnant we are happy because*
585 *we are breastfeeding.*

586 *Participant 3: Testing girls for pregnancy does not pose any problems because they have*
587 *grown up. For us mothers, if it is me, finding my daughter in this state [pregnant], for me it is*
588 *a help because I live with her without knowing. It happened to me, I want to be honest, I sent*
589 *my daughter to school without knowing that she was pregnant. The school sent her back home*
590 *because she was pregnant, but if I had known before, I wouldn't have sent her to school.*

591 *Participant 5: I don't see any problem in testing my daughters because if you find out that my*
592 *daughter is pregnant, and tell me I will have information or tell her in secret, she will come to*
593 *know that she is pregnant (...); there is no problem (...)” (FGD 07, general population,*
594 *Mapulanguene).*

595

596

597 ~~*“Normally, when a woman is pregnant she has to go to the hospital to be tested, but there are*~~
598 ~~*others who know the importance of being tested and there may be something that is not right,*~~
599 ~~*if you come to test the person you may discover something that the person did not know. The*~~
600 ~~*fieldworkers test women in the clusters to know if they are pregnant or not. But if they are, they*~~
601 ~~*rescue the woman quickly or advise her to go to hospital for further care very early” (SSI 11,*~~
602 ~~*member of the community, man, Panjane).*~~

603

604 **Acceptability to take malaria pills at home**

605 Most participants accepted to take malaria pills at home even when they were not sick ~~of~~with
606 malaria as they perceived that pills prevented malaria to the members of the family and
607 community members, which in turn prevents people to ~~often~~ go to the health facility often
608 because some of them lived far from the health facility. In addition, a community leader stated
609 that since the start of the mass drug administration, he has witnessed a reduction in malaria
610 cases. The same participant also said that the community had learned from previous
611 experiences, such as MDA, that malaria pills protect people from diseases.

612

613 *“I accept taking tablets even without malaria. Even if field workers leave my neighbour's house
614 after giving pills, come here at home, we all have a duty to accept, because since we started
615 taking pills in 2016 until now we have seen a reduction in malaria. So, we should not refuse,
616 we have to accept taking tablets to prevent malaria”* (SSI 09, community leader, Magude
617 village).

618

619 Regarding the easiest group to accept malaria pills, some participants mentioned young and
620 adult women, adult men, elders, community leaders and all people with the ~~disease~~ experience
621 of malaria disease and those who were not willing their family members to get it.

622

623 *“Neither our ladies' group nor the gentlemen's group can refuse, because when you start to get
624 sick, no one is happy about it, we rejoice when our children and we adults are in good health.
625 Therefore, we cannot refuse [to take pills]”* (FGD 04, general population, Mahele).

626

627 *“I think the group of mothers are the ones who understand the most, because they have younger
628 children. They quickly understand why they prevent themselves and their child's health. They*

629 usually follow the healthcare programmes. The elderly also easily accepts to take the pills. In
630 general, adults will accept because they comply with one thing and another that is said. When
631 you speak, they feel firm in your words and you make sure that you also do it in your house,
632 they like it” (SSI 04, community health worker, Mapulanguene village).

633
634 ~~“The people who most accept to take pills are those who have information about why malaria~~
635 ~~exists and those who already feel it in their skin because they have had malaria in the past (...)~~
636 ~~They are the people who already know they have malaria and do not want their family to have~~
637 ~~it too (...)” (SSI 05, healthcare professional, Panjane health facility).~~
638

639 **Barriers to reactive focal mass drug administration**

640 Questioned on the main barriers to the reactive focal mass drug administration, the ~~included~~
641 different ~~groups of the~~ community groups said that there were some barriers regarding the
642 ongoing implementation of rfMDA. They predicted that not everybody would accept to be
643 tested and some community members might insult or mistreat the fieldworkers because each
644 member has its own way of thinking. Additionally, some participants said that some household
645 heads might not allow fieldworkers to enter in the house and treat the members of the family,
646 or fieldworkers might be poorly treated, while others pointed out issues related to the absence
647 of some or all members of the household. For the participants, these barriers could hinder the
648 rfMDA programme.

649
650
651 ~~“It depends, not all of us here can accept the same thing [home testing]. It depends on each~~
652 ~~one's interpretation, I can accept and my mother can't, but we are living in the same house, it's~~

653 ~~my mother, I'm the daughter, but I can deny and she can accept, each person has her own way~~
654 ~~of thinking” (SSI 08, adolescent, Magude village).~~

655
656 “It is possible that the person you are going to meet in some household will insult you; he may
657 say: go back with that job of yours (...). Other people may make jokes and talk a lot of nonsense
658 (...)” (SSI 05, community leader, Magude village).

659
660
661 ~~Some participants also said that some household heads might not allow fieldworkers to enter~~
662 ~~in the house and treat the members of the family, or fieldworkers might be poorly treated, while~~
663 ~~others pointed out issues related to the absence of some or all members of the household. For~~
664 ~~the participants, these barriers could hinder the rFMDA programme.~~

665
666 ~~“Fieldworkers can be turned away, not allowed to enter in the houses. As community leaders,~~
667 ~~we have been called by neighbours, informing that the fieldworkers wanted to enter in a~~
668 ~~household, but they were being threatened (...)” (SSI 03, community leader, Mahele).~~

669
670 “The only barriers they [fieldworkers] can find are like arriving at a house and not finding
671 anyone. After sometimes, this family may get sick while people [fieldworkers] have already
672 passed (...)” (SSI 17, member of the community, man, Panjane).

673
674 **Barriers to home testing ~~for~~ malaria**
675 Regarding the barriers to home testing, participants mentioned some barriers, such as the
676 repeated pricks to collect blood samples and difficulties to collect blood samples among
677 children because some participants perceived that the blood of the child would finish as

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678 children ~~have little~~ do not have a lot of blood. In addition, it was also mentioned that some
679 household heads might not accept the test for themselves and their family members due to lack
680 of awareness about the malaria testing.

681
682 *“Difficulties may exist when fieldworkers prick children and the blood doesn't come out, or*
683 *when they prick someone and the blood doesn't come out; when they insist and prick up to*
684 *three times on the same finger the person starts to feel pain. And, when it's a child, if they prick*
685 *several times the blood will finish because the child still doesn't have much blood”* (FGD 07,
686 general population, Mapulanguene).

687
688 *“What might be a hindrance to the activity is if the head of the household does not accept the*
689 *malaria test for himself and his household members because he might not think it is important*
690 *(...). If the householder refuses, it will not be possible to do the malaria test”* (SSI 04, member
691 of the community, man, Magude village).

692

693 **Barriers to pregnancy test**

694 Participants presented several barriers regarding pregnancy test, which included, management
695 of positive pregnancy test disclosure specially when the women's husbands work far from
696 home, existence of difficult groups to perform pregnancy tests, perceptions about who should
697 perform a pregnancy test in women, as well as, the fear of family problems.

698

699 Participants agreed that it would be difficult to test and manage pregnancy test results among
700 women whose husbands work and live in South Africa. In fact, among the male participants,
701 particularly the ones working far from their homes, raised a concern regarding the disclosure
702 of the pregnancy test result. The concern was that the disclosure of pregnancy in their absence

703 could create worries as the community would be the first to know, and they might not certify
704 if their wives were faithful. Thus, they requested that the disclosure of the pregnancy test should
705 be a secret.

706
707 “There will be problems in my house with my sister-in-law because her husband is not in, he
708 went to South Africa. So, if the fieldworkers find out that she is 2 months pregnant while her
709 husband has long travelled to South Africa, we need to have a good talk with her. But if it is
710 my daughter who is pregnant, there is no problem. You can tell me” (FGD 07, general
711 population, Mapulanguene).

712
713 ~~“I think the problem will arise when fieldworkers find that a woman has 2 months pregnant~~
714 ~~while her husband has been in South Africa for more than 5 months; but this can become a~~
715 ~~problem if the fieldworkers disclose this information because the husband’s parents will want~~
716 ~~to know where she got the pregnancy; and that can be a problem. So, to prevent this problem,~~
717 ~~fieldworkers, first should ask whether the household head is in or not. If the head of household~~
718 ~~is in South Africa, we will be afraid to test their wives, because if we test, it may cause~~
719 ~~confusion” (SSI 17, member of the community, Panjane).~~

720
721 ~~The male participants, particularly the ones working far from their homes, raised a concern~~
722 ~~regarding the disclosure of pregnancy test. The concern was that the disclosure of pregnancy~~
723 ~~in their absence could create worries as the community would be the first to know, and they~~
724 ~~might not certify if their wives were faithful. Thus, they requested that the disclosure of the~~
725 ~~pregnancy test should be a secret.~~

726

727 *“Participant 3: Regarding the difficulties of pregnancy testing for women, we request that your*
728 *fieldworkers who will be distributing pills, have confidentiality because from my wife's side, I*
729 *work and stay a long time on duty, I end up staying 2 months without coming back. I may think*
730 *that my wife has nothing [pregnancy] while she is pregnant. So, if there is a leak that my wife*
731 *is pregnant and I don't know, nor have I seen; excuse me, but we need to be clear, because I*
732 *will no longer know if that pregnancy is mine or not. Your fieldworkers should have*
733 *confidentiality; (...) you didn't come to destroy our homes, you came to help us, so we ask for*
734 *confidentiality when it is proven that women are pregnant.*

735 *Participant 5: I agree with what the colleague said. It would be good if fieldworkers could test*
736 *and say how many months of the pregnancy: one or 2 months; because I can stay in South*
737 *Africa (...) 3 or more months working outside home and, the fieldworkers find out that my wife*
738 *is 2 months pregnant, but I have been outside home for more than 3 months (...). Then when*
739 *they find out that she is pregnant, the fieldworkers cannot talk in the community because they*
740 *have not come to destroy our homes”* (FGD 08, general population, Mapulanguene).

741
742 Regarding the difficult groups to perform pregnancy test, both adult women and men,
743 community health workers and community leaders mentioned adolescents. They predicted that
744 adolescents may refuse the pregnancy test at home due to fear of their parents, because if they
745 are tested positive, their parents would know that they are pregnant and this can be a family
746 issue as they might be hiding the pregnancy.

747
748 *“The ones who usually deny pregnancy test are the girls. Since the test will be done at home,*
749 *they know that if they test me here where the breast is, she will find out that I am pregnant”*
750 (FGD 09, general population, Mahele).

751

752 “Girls tend to hesitate to take the pregnancy test. They say they are not pregnant while they
753 are hiding” [the pregnancy] (SSI 10, community leader, Mapulanguene).

754

755 Adolescents, however, said that they were not afraid of pregnancy tests. They added that who
756 had to decide about pregnancy testing for them were their parents. They perceived that their
757 parents may not allow them to do pregnancy testing due to social norms. They explained that
758 if they are found pregnant they had to inform their mothers, and not their fathers or the
759 mother and the father at the same time.

760

761 “Mums might not accept their daughters taking the pregnancy test because if me and my
762 parents, mummy and daddy are sitting in the same place, no matter how much something
763 forbidden happens to me [menstruation or pregnancy] I can't tell my dad. I have to go and tell
764 my mummy because I don't know anything yet, I'm underage, they tell me to do this, this and
765 this, and I say 'that's fine thank you'. Then mummy might not accept that I do pregnancy test in
766 front of my daddy because he will know the results immediately” (SSI 01, adolescent, Magude
767 village).

768

769 Some participants, particularly women of reproductive age, said that some household heads
770 might not accept their wives to perform a pregnancy test because most men perceived that a
771 pregnancy test must be performed by a woman and not by a man fieldworker. Participants
772 added that some women might refuse pregnancy test due to fear of violence of their husbands.

773

774 “The group that might not allow women to do the pregnancy test are men, because they think
775 that a man has no right to test pregnancy on a woman, only a woman can test pregnancy on
776 another woman” (SSI 17, member of the community, woman, Panjane).

777

778 “Women may refuse pregnancy testing for fear of violence of their husbands; this can happen.
779 Some men may be violent to their wives if they accept the test without their consent” (FGD 10,
780 general population, Magude village).

781

782 However, other participants, particularly men, said that women of reproductive age do not like
783 to do pregnancy tests at home because they said that if they wanted to know about their
784 reproductive health, they would go to the hospital.

785

786 “There are many women [of sexually reproductive age] who do not like to take a pregnancy
787 test. When they are talking on the street, they say that 'testing people is not good, because if I
788 want to have a baby, I know the way to the hospital, I know how to do it, testing people is not
789 good'. (...). It has been more the women who deny the pregnancy test because they say that they
790 know where to get help, which is in the hospital” (SSI 04, household head, Motaze).

791

792 Other participants said that some women might deny pregnancy test due to fear of pregnancy
793 disclosure within the family. Additionally, they said that some women might also make use of
794 pills distributed to prevent malaria to do the abortion of unwanted pregnancy, as they are
795 already aware that malaria pills may ~~cause abortion~~ interfere with the pregnancy.

796

797 “Other women may refuse to do the pregnancy test if they know they are pregnant and they did
798 not want to [unwanted pregnancy], and they may want to take the pills without testing to take
799 advantage of the pregnancy [have an abortion] ... because in the other malaria campaign
800 [MDA] it was said that if you take pills when you are pregnant, the pregnancy will come out
801 [you can have an abortion]. But, other women can refuse to be tested because it can be found

802 *out that they are pregnant Our daughters may not know that they are pregnant, but after*
803 *the test they will know and we will also find out and ask them about the pregnancy”* (FGD 09,
804 general population, Motaze).

805

806 **Barriers to the administration of malaria pills at home**

807 All participants pointed out some barriers that can hinder the uptake of malaria pills. These
808 barriers included people’s perception and habits about when to take pills, side effects, lack of
809 compliance ~~onef~~ the dosage, lack of decision-making ~~byof~~ the household head, conflict of
810 prescription between the recommended malaria pills and local traditional medicines, lack of
811 adequate information, and existence of groups who can ~~resist-refuse~~ to take pills.

812

813 Regarding people’s perceptions about when to take pills, some healthcare professionals
814 mentioned that most members of the community perceived pills as substances to be taken when
815 they are sick, and it would be challenging to request people to take malaria pills while they
816 were not feeling sick.

817

818 *“I think that there will be some barriers because our communities, the characteristic of our*
819 *communities, is to take some pills when they are sick. So, when you arrive in the community*
820 *and tell people to take pills while they do not feel sick, then this ends up creating a situation*
821 *that is not good for the community. So, this is the main barrier that even we as an institution,*
822 *we have been facing because they only take pills when they are sick”* (SSI 04, healthcare
823 professional, Mahele health facility).

824

825 In fact, to substantiate healthcare professionals’ predictions, some participants, particularly
826 household heads and adolescents, confirmed that they would not take malaria pills unless the

827 test shows that they have malaria, even if their neighbours or other members of the family were
828 tested positive to malaria.

829
830 *“(…) I cannot accept taking pills just because they tested and found that my neighbour had*
831 *malaria while my test was negative, because they tested to know if I have malaria, and they*
832 *told me that I don't have malaria; and then if they give me pills to take; that I cannot accept”*
833 (SS 01, household head, Panjane).

834
835 *“I can't accept to take pills because I don't have malaria, even if my neighbour was detected*
836 *malaria in the hospital”* (SSI 01, adolescent, Panjane).

837
838 Another barrier was regarding participants' previous experiences ~~s of about~~ malaria pill's side
839 effects. Some participants said that some people might not accept taking malaria pills because
840 when they took in malaria pills in the previous campaign (MDA), they experienced dizziness.

841
842 ~~*“It will be difficulties because I believe that not all [people] will want to take the pills, they will*~~
843 ~~*have doubts, because of the reactions of the pills. From what I have experienced, I believe that*~~
844 ~~*at the time of the campaign people were not explained why they had to take pills, what might*~~
845 ~~*happen after taking the pills. This information would have prevented people to get panic”*~~ (SSI
846 ~~06, healthcare professionals, Magude health facility).~~

847
848 *“People may not take the pills because of dizziness, because the pills cause dizziness; they*
849 *make you dizzy. It happened with my grandson, he got dizzy, he was shaking after taking*
850 *malaria pills in the second day. We went to the hospital and they prescribed other pills that we*

851 *have to buy from the pharmacy outside, but the pharmacy was closed because it was Sunday,*
852 *and it was difficult to manage the situation”* (FGD 11, general population, Magude village).

853

854 Lack of compliance with malaria pills dosage was also reported as a barrier. The discourse of
855 some participants pointed out that some people only took the pills in the first day, in the
856 presence of the fieldworkers. But, they did not adequately take the pills in the following 2 days
857 as they had been recommended.

858

859 *“I think that there are still difficulties in taking the pills because some people, when the*
860 *fieldworkers leave those pills that they have to take in the absence of the staff, some don't take*
861 *it. I can believe that some don't take it, this is because the same person... the same family*
862 *member, whose other was tested positive, when they leave it for him to take it, he doesn't take*
863 *them, and three days later he shows up at the health facility with malaria, and sometimes,*
864 *when we ask if he took the medicine that fieldworkers left, and he says yes, while he simply*
865 *didn't take it”* (SSI 2- healthcare professional, Magude village health facility).

866

867 *“(…) Most people do not take pills until finishing the dosage. They interrupt it and drink beer,*
868 *but they won't get better, they will always be in hospital because they have transgressed the*
869 *norms, crossed the line, and they will always get sick”* (FGD 01, general population, Panjane).

870

871 Healthcare professionals and community health workers mentioned the absence of the
872 household head or lack of his consent as a barrier to all family members to take the pills.

873

874 *“One of the barriers would be if field workers arrive in a household where the head of*
875 *household is not there, practically that person will not be attended to. Fieldworkers will not be*

876 *received, they will have to wait for the head of household to authorise, then they will not be*
877 *able to work”* (SSI 05, healthcare professional, Panjane health facility).

878

879 According to the participants, the intake of traditional medicines might be another barrier to
880 home intake of the drug. Community leaders and healthcare professionals mentioned that there
881 might be a conflict between the recommended malaria pills and local traditional healers’
882 practices. They explained that some traditional healers may refuse malaria pills alleging that
883 they treat it themselves. Others said that children or other people might not be allowed to take
884 malaria pills at the same time that are taking traditional medicine prescribed by the traditional
885 healers.

886

887 *“Another barrier would be to get to the household head, let's suppose that the head of that*
888 *household is a healer, he thinks he can treat malaria, or he can only treat the person who has*
889 *malaria, not those people who don't have it, he knows how to do things. He will say: no, here*
890 *at home these are the rules, I treat it, no one get sick of malaria (...). It would be difficult to*
891 *convince him because he thinks that he can treat himself, he is already a doctor, he calls himself*
892 *a house doctor, it would be difficult to medicate this healer, because he thinks that he is also a*
893 *professional. And he may not let the fieldworkers do their job because of some myths. You can*
894 *explain to him that there is no traditional treatment for malaria, but he still has these taboos”*
895 (SSI 05, healthcare professional, Panjane health facility).

896

897 *“For example, here in Mapulanguene [name of administrative Post], there are traditional*
898 *healers who prescribe traditional medicine to children and other people. You may come to a*
899 *family, and they can say: "today I gave traditional medicine to my son, and he/she cannot take*
900 *malaria pills", you may find that”* (SSI 10, community leader, Mapulanguene).

901

902 The future possibility of getting malaria ~~even-sometimes~~ after taking the pills was mentioned
903 as another barrier. Some healthcare professionals said that some people might ask “*for how*
904 *long they will get malaria after taking pills?*”, and if they are aware that even taking the pills,
905 after sometimes (approximately 6 weeks) they ~~will-can~~ still get malaria, they might not adhere
906 to the pills.

907

908 “*One of the barriers would be, for how long will I not have malaria, for how many years? That*
909 *question anybody can ask, as long as they don't have exact information about the drug, they*
910 *can ask this question for how long, if it's for a short time, he or she may reject saying: 'there's...'*
911 *I don't have malaria, what's the point if after so long I'll have malaria*” (SSI 05, healthcare
912 professional, Panjane health facility).

913

914 Indeed, some participants with previous experience of malaria pills treatment questioned the
915 usefulness of the malaria pills because they still got sick even after taking the pills.

916

917 “*We heard that malaria will end after taking the pills, we took the pills but we still get sick with*
918 *malaria*” (FGD 08, general population, Mapulanguene).

919

920 Almost all participants said that the main barrier would be the lack of adequate information
921 about the importance of pills for malaria prevention. They also added that another barrier would
922 be lack of information about how and when to take the malaria pills. Participants reported that
923 not all fieldworkers offered adequate information before requesting people to take the pills.

924

925 *“Inform your fieldworkers who are distributing pills, in the beginning there were problems*
926 *because people said that: ‘I cannot take pills because we had not eaten’, and we are not yet*
927 *well clear in our heads. We asked that when the campaign starts, also bring food because we*
928 *thought we could take pills after the meal; while it is not. We went to find out that it was a*
929 *mistake of some fieldworkers. It is not everything that they tell us, that they explain clearly in*
930 *the households. Some fieldworkers misrepresent the information, it is important that they come*
931 *while they have clear knowledge of what they are going to do. They say that these pills can*
932 *only be taken after the meal”* (FGD 08, general population, Mapulanguene).

933

934 In fact, some healthcare professionals experienced the impact of this misinformation in some
935 communities. They reported that some people refused to take pills unless it was also
936 accompanied with some food distribution.

937

938 *“The big barrier, which is not even my opinion, but it is what I have experienced in the*
939 *community, is that once I went to talk to my neighbour, I tried to convince her to take the pills,*
940 *but she did not accept for the following reason, she says: “first they should give us food, they*
941 *always only come to give us pills after pills, first you have to eat to be able to take pills. Why*
942 *don't they give us food? They are only handing out pills”, this is one of the barriers that is*
943 *common in the community”* (SSI 07, healthcare professional, Magude village health facility).

944

945 Additionally, sSome community health workers and general population who participated in
946 this study reported that it would be difficult to convince members of the community to take
947 pills because the fieldworkers were outsiders, and local community health workers or members
948 of the local communities were not involved in the campaign.

949

950 *“In the previous campaign, it would have been possible to eliminate malaria, but it was not*
951 *possible because outsiders were recruited and worked in the campaign. We had problems*
952 *because they [fieldworkers] did not work with us [local community health workers]. So, in*
953 *some households, they had difficulties because people did not accept to take pills as they did*
954 *not trust those who were distributing pills”* (SSI 04, community health workers,
955 Mapulanguene).

956

957 With regards to the groups that are resistant to take malaria pills, participants presented mixed
958 perceptions. Most of the participants said that young people, particularly boys and drunken
959 people were mostly the groups that would refuse to take pills.

960

961 *“The group that refuses to take pills is the group of boys, because I have a boy who refuses to*
962 *take it, he does not accept it, but we take it [adult men and women] (...). We don't succeed to*
963 *convince young people to take pills. They will not take it. You can meet them here at the gate*
964 *and say that you need person 'X', he will tell you that he has just left, while it's himself. The*
965 *fieldworker will leave, but if I tell the fieldworker that 'that is the person you are looking for';*
966 *he can turn and kill me”* (FGD 10, general population, Magude village).

967

968 *“We drink beer, when you arrive, I will have already drunk beer, they [fieldworkers] give us*
969 *medicine and tell us to take it, while we are already drunk. Even those pills that others say are*
970 *bad, in reality, they don't make you sick, when the fieldworkers arrive they find me drunk and*
971 *they tell me to take [pills] there in the presence of them [fieldworkers], so, the person gets*
972 *drunk twice”* (FGD 06, general population, Magude village).

973

974 Adolescents and healthcare professionals, however, perceived that adult people working in
975 South Africa and elderly were groups that would mostly refuse to take pills.

976

977 *“The majority, the new ones, (...) I’m talking about the young people, those don’t have*
978 *problems. I believe that a big part of the people who inhibit family members from taking pills,*
979 *are adult people who work in South Africa, because they don’t know where we are coming from*
980 *and where we are going to. They don’t get the information in the first hand, or hear it from*
981 *someone; they only hear rumours, and they end up inhibiting their relatives from taking the*
982 *pills”* (SSI 08, healthcare professional, Magude village health facility).

983

984 *“The elderly and fathers [adult people] only take pills when they want, others only take them*
985 *in the first day, the next day they don’t take them, and they say: “as soon as they [field workers]*
986 *are gone, they won’t see that we are not taking it” and, they leave the pills”* (SSI 10, adolescent,
987 Panjane).

988

989 **Perceptions about ways to increase adherence to reactive focal mass drug** 990 **administration**

991 All participants of different ~~groups of the~~ community groups perceived that several strategies
992 could be used to uptake-increase community participation in rfMDA, including the need for
993 more awareness about rfMDA, planning of the activities, access to accurate information about
994 antimalarial pills, supervision during the administrations of the pills and improvement of
995 attitudes of fieldworkers.

996

997 The access to accurate information was considered crucial to uptake-increase adherence to
998 rfMDA. Thus, participants suggested more community engagement ~~that-includ~~inges door to

999 door sensitization, use of entertainment activities, such as theatre ~~during-for~~ sensitization, as
1000 well as the inclusion of community leaders during the campaign and rfMDA implementation.

1001
1002 *“Community leaders should be informed to gather the population and inform them about the*
1003 *malaria campaign. They should be informed about the month and day when the fieldworkers*
1004 *will come to the community. People should be informed about the importance of the pills and*
1005 *appeal to the population not to run away during the fieldworkers’ visit. When the campaign*
1006 *starts the community leaders should be informed and they should accompany the fieldworkers*
1007 *because they are the ones who know the communities”* (FGD 09, general population, Motaze).

1008
1009 ~~*“Sensitization of the population should be done in a timely manner, about one month before*~~
1010 ~~*the campaign starts. Mobilization should be done house to house or hold meetings for these*~~
1011 ~~*mobilizations. Talk about things that people will understand and prevent misrepresented*~~
1012 ~~*information. Mobilise the locality chiefs and secretaries of the neighbourhoods so that they*~~
1013 ~~*mobilise the populations because they are the ones with power”*~~ (SSI-06, healthcare
1014 ~~professional, Magude health facility).~~

1015
1016 Most participants also said that they were often busy with their everyday activities, and they
1017 might not be at home during the visit of the fieldworkers. So, they proposed that rfMDA
1018 activities should be well planned, people and community members should be informed
1019 beforehand about the day and time the fieldworkers will visit, and also, they should comply
1020 with the planned day. Participants perceived that this would prevent absence of the members
1021 of the household.

1022

1023 Almost all participants reported that it was important to give accurate information about
1024 antimalarial pills in advance. They explained that people should be informed about the
1025 importance of the pills, explaining its adverse effect and evaluating if some people are sick of
1026 some disease contraindicated to antimalarial pills.

1027
1028 *“People should be told why it is important to take pills, what the pills are for, and whether the*
1029 *person is sick. This is because you may meet the people while they are not sick and they may*
1030 *wonder why they have to take pills if they are not sick. Then, you should explain what those*
1031 *pills are for. I think that after explanation people will accept to take the pills”* (SSI 08,
1032 adolescent, Magude village).

1033
1034 ~~*“Other fieldworkers just come and give us pills, they don't explain what they are for. People*~~
1035 ~~*do not know what prevention is, you have to explain well, say that they should take tablets to*~~
1036 ~~*prevent malaria”*~~ (SSI 07, member of the community, man, Mapulanguene).

1037
1038 *“First, it would be better to explain what these pills are, their adverse effects: this can happen*
1039 *and that, you can do this at home; advise people that if they feel ill they can go to the hospital,*
1040 *etc. I think the big problem is the adverse reactions of the pills. You should explain to the*
1041 *patient that it may happen, this, this, this..., that they shouldn't be alarmed, it's natural, it's the*
1042 *effect of the medication, after a while it may pass, if it doesn't, they can go to hospital”* (SSI
1043 06, healthcare professional, Magude village).

1044
1045 Some participants explained that some fieldworkers recommend drunken people to take
1046 antimalarial pills, while others do not give pills to drunk people at all. These participants

1047 perceived that people should not take pills after drinking alcohol, and they suggested that pills
1048 should be left at the household, and people would take in the following day.

1049
1050 *“Usually, the fieldworkers arrive late and find people already drunk. But, some fieldworkers*
1051 *say even if the person is drunk, they recommend him to take the pills. So, we are used to it, that*
1052 *if you have just drunk, you should not take pills. We deny taking the pills after drinking”* (FGD
1053 05, general population, Magude village).

1054
1055 *“If the person is drunk, the fieldworkers should leave the pills, and leave recommendations*
1056 *with a person who is not drunk. He will take it the next day when the drunkenness is finished”*
1057 (FGD 06, general population, Magude village).

1058
1059 Some participants suspected that not all people comply with the recommended dosage of the
1060 antimalarial pills. To overcome this problem, healthcare professionals proposed supervision
1061 during the administrations of the pills. They explained that the fieldworkers should visit the
1062 households and monitor the compliance of malaria pills intake during the three days of
1063 dosagerecommended days.

1064
1065 ~~*“Fieldworkers could stay in the community for some period of time to monitor pills taking. Tell*~~
1066 ~~*the patient that I will come back tomorrow to the house to see if he has taken the pills, to find*~~
1067 ~~*out about adverse reactions, if there was anything, or if he happened to feel unwell (...). So,*~~
1068 ~~*the fieldworkers would distribute and monitor the pills at the same time. What sometimes*~~
1069 ~~*betrays us is: I leave the pills and say: ‘today you take it, tomorrow you take it’. The person*~~
1070 ~~*takes it today, then he understands that he is not sick, and the person stops taking the pills”*~~
1071 ~~(SSI 01, healthcare professional, Mahele health facility).~~

1072

1073 *“To comply with the dosage, I think people should take the pills in the presence of the*
1074 *fieldworkers, and not let the patient decide to take it in the following days alone. He can have*
1075 *a party and stop taking the pills, and he can take them when he wants. The lack of monitoring*
1076 *can cut the effect of the medicine itself”* (SSI 08, healthcare professional, Magude village health
1077 facility).

1078

1079 A considerable number of participants appealed to the improvement of fieldworkers’ attitudes
1080 as they perceived that fieldworkers do not often comply with the local cultural norms such as
1081 greeting the members of the households, explaining the reason why they are visiting that
1082 household and explaining why and how to take antimalarial pills. Participants expected humble
1083 and respectful fieldworkers, and they suggested that fieldworkers should not be young people.

1084

1085 *“Participant 1: It is necessary that when a fieldworker arrives at a house he should greet, after*
1086 *he has greeted we will give him chair to sit, and then he communicates to us about the reason*
1087 *why he came to visit us, he explains to us how the pills are taken. But there are some*
1088 *fieldworkers who are very young who create difficulties...they don't explain, they don't know*
1089 *how to answer adult people.*

1090 *Participant 3: Even if they are not young fieldworkers, some when they arrive they say: "you*
1091 *have to take pills, you also have to take them here", even when someone has asthma, they say:*
1092 *"you have to take, take pills. So, that's what we don't want.*

1093 *Participant 5: (...) They [fieldworkers] should explain their mission well and in a good way so*
1094 *that they can give us pills and we take them, in as much as we are satisfied also; they should*
1095 *not prick the heart [not offen] the person, because if they prick the heart the person already*
1096 *takes the pills unsatisfied”* (FGD 05, general population, Magude village).

1097

1098 *“Participant 1: Fieldworkers should be people with respect, they should not come with pride,*
1099 *others come with their own problems and put out on me, we will not agree to each other, and*
1100 *some may be sent away.*

1101 *Participant 4: A fieldworker has to be someone who works with an open heart and calm, so*
1102 *that we can also receive him well”* (FGD 11, general population, Magude village).

1103

1104 Some participants also claimed that fieldworkers were outsiders of the community. They
1105 proposed training of some local fieldworkers who could understand local language, practices
1106 and culture, and who would build a strong relationship with the local communities.

1107

1108 *“Among the fieldworkers, they should include ladies or girls from our area. These people know*
1109 *the local life, it would be simple for them to greet “how are you”, have you ever felt something*
1110 *“X”; they would be able to explain the local people in a good manner”* (DGF 07, general
1111 population, Mapulanguene).

1112

1113 *“The rMDA programme should involve local communities; involve someone from the*
1114 *community, it would be better to train someone local that the communities know, it would*
1115 *create confidence in the community, it could be a huge help. The knowledge of that person*
1116 *could help them to join the campaign. Most of the time, it is not because the person does not*
1117 *want to take pills, but the reason is that the fieldworkers distribute the pills and then disappear,*
1118 *they have no connection with the local communities. Some people resist taking pills because of*
1119 *lack of trust to the fieldworkers; because they don't know those people [fieldworkers]. The*
1120 *population may think maybe the fieldworkers want to kill them; if someone dies who will they*
1121 *turn to? For example, if I am a local fieldworker, I arrive at my neighbour's house, she may*

1122 *even resist a bit to take pills, I try to convince her, (...) she ends up having a different idea, and*
1123 *accept. She will think that my neighbour can't give me this to kill me, if she kills me I'll go to*
1124 *her house (...). So, if we involve the community a little more, if local people are also into the*
1125 *programme, I think it will be better, we will have a greater adherence, and the programme*
1126 *goals can be achieved'* (SSI 05, healthcare professional, Panjane).

1127

1128 **Discussion**

1129 This qualitative study analysed acceptability and perceived barriers to reactive focal mass drug
1130 administration (rfMDA) among community members exposed to community engagement
1131 campaigns and malaria elimination interventions in rural Magude district. The study found that
1132 all group members of the community included in the sample accepted rfMDA regardless the
1133 place of residence. This acceptability was associated to the awareness about rfMDA as a result
1134 of community engagement campaigns. The perceptions that rfMDA, like the previous MDA,
1135 would prevent malaria, improve people's health status, and the fact that the procedures used
1136 would reduce the cost ~~incurred by~~ transport to the health facility also influenced rfMDA
1137 acceptability. Moreover, participants perceived malaria as a local health concern, and they
1138 believed that rfMDA could help to eliminate it. ~~These~~ results ~~are~~ consistent with previous
1139 studies in the same study setting [7,9]. In particular, these previous studies found that high
1140 acceptability of MDA was influenced by the perception of malaria as a main health problem
1141 [9] and ~~by the~~ community engagement campaign [7]. Moreover, others studies undertaken in
1142 Tanzania [17], Eswatini [18] and Cambodia [19] showed that perceived risk for malaria
1143 influenced acceptability of malaria treatment.

1144

1145 The results of this study also reveal that the procedures used in rfMDA were accepted despite
1146 mixed perceptions about the process of management of pregnancy test outcomes and

1147 administration of antimalarial pills to all members of the community. The acceptability of the
1148 rfMDA procedures derived from the awareness of the communities that those were
1149 recommended procedures to access antimalarial pills; perceptions of the procedures as norms
1150 of the health facility, the willingness to know one's health status, and the recognition that
1151 malaria could be hidden in the body and transmissible to other members of the community.
1152 This result highlights high awareness of malaria transmission and desire for its elimination.
1153 Like other studies in the Gambia [20] reported, the acceptance of antimalarial pills without
1154 malaria symptoms, may reveal a strong sense of responsibility of the participants of this study
1155 toward protecting themselves, their family members and their neighbours.
1156
1157 Despite community acceptability and high awareness of the procedures used in rfMDA, some
1158 procedures such as performing malaria tests on children and pregnancy
1159 testing tests were not often welcome, and they could hinder the uptake of rfMDA campaign.
1160 The results of this study showed that some participants were reluctant to perform malaria tests
1161 among to children as they perceived it could harm children's health by reducing the amount of
1162 blood in their body. In addition, participants were concerned about pregnancy test decision-
1163 making and pregnancy testing result disclosure because it could contribute to disagreement
1164 among couples, especially when a wife does a test without her husband's consultation, or if
1165 other members of the community access the information about a positive pregnancy test before
1166 the husband. Moreover, participants had experience of previous antimalarial pills, and they
1167 were concerned about drug adverse reactions, and others were reluctant to take drugs without
1168 malaria symptoms. These barriers have also been documented in previous studies [18, 21-24].
1169 Furthermore, like previous studies [25] have reported, lack of access to accurate information,
1170 spread of misinformation about malaria intervention, being unable to drink alcohol while

1171 taking DHAp [7], lack of trust of fieldworkers, and the demand of food as precondition to take
1172 DHAp are potentials barriers to rfMDA.

1173
1174 The barriers identified in this study reflect the need of more community engagement in malaria
1175 campaign, which include the community appropriation of the malaria elimination process,
1176 involvement of community leaders in the whole process, and training of local community
1177 health workers and other local eligible people to serve as fieldworkers. This strategy could
1178 contribute to community self-appropriation of the malaria elimination campaign, and it would
1179 build a strong relationship between fieldworkers and the community. As the participants
1180 suggested, local fieldworkers are more appropriate to work with communities than outsiders as
1181 they are more prone to follow and respect the local cultural norms, and this could help to build
1182 a strong relationship with the communities.

1183
1184 Community engagement is crucial, and it has been recognised as central to malaria campaign
1185 uptake [26, 27]. Several strategies could be used to strengthen rfMDA, including house-to-
1186 house visits to inform the population about the planned campaign, and provide non-monetary
1187 incentives, such as bed nets, food or school material to children or other things that can
1188 incentivise people to participate in the malaria campaign. Incentivising communities has been
1189 found as a valid community engagement strategy in a similar campaign in Cambodia [27],
1190 where it contributed to the increasing participation of the population in malaria campaign.

1191

1192 **Limitations**

1193 This study is limited to the study setting and the selected participants, and the results could not
1194 be generalized to other settings. Given to the nature of the qualitative methodology that guided
1195 this study, the study sampling was not representative of the study population, and it was subject

1196 to sample-bias because only some participants, who were considered as representing specific
1197 groups of the community, were selected according to the study objectives. This sample strategy
1198 led to exclusion of other community members who could have different views about the study
1199 object.

1200

1201 **Conclusion**

1202 The community of Magude district found rfMDA and its procedures acceptable ~~as at~~ malaria
1203 intervention. This acceptability was associated to rfMDA awareness deriving from community
1204 engagement, previous experience of malaria similar campaigns, such as MDA, and willingness
1205 of the community to eliminate malaria. However, some barriers, such as lack of decision-
1206 making on pregnancy test among women, fear of pregnancy test results, lack of accurate
1207 information about rfMDA, fear of DHAP adverse reactions, and reluctance to take drugs
1208 without malaria symptoms might affect rfMDA campaign. Thus, there is a need to continue
1209 with community engagement and built community self-appropriation of the malaria
1210 programme. This could include involvement of local community leaders, before and during
1211 rfMDA, and local community health workers and other local people who can work as
1212 fieldworkers during rfMDA campaign. Including community's members in rfMDA
1213 implementation could optimize rfMDA uptake, and therefore contributing to malaria
1214 elimination.

1215

1216 **Supporting information**

1217 **S1A Appendix. Semi-structured interview (SSI) guide for household heads, women of**
1218 **reproductive age, adolescents, members of the general community and community**
1219 **leaders (Portuguese version)**

1220 **S1B Appendix. Semi-structured interview (SSI) guide for household heads, women of**
1221 **reproductive age, adolescents, members of the general community and community**
1222 **leaders (English Version)**

1223 **S2A Appendix. Semi-structured interview (SSI) guide for healthcare professionals and**
1224 **community health workers (Portuguese version)**

1225 **S2B Appendix. Semi-structured interview (SSI) guide for healthcare professionals and**
1226 **community health workers (English Version)**

1227 **S3A Appendix. Focus groups discussion (FGD) guide for general population: men and**
1228 **women (Portuguese version)**

1229 **S3B Appendix. Focus groups discussion (FGD) guide for general population: men and**
1230 **women (English version)**

1231 **S4 Table. Consolidated criteria for reporting qualitative studies (COREQ): 32-item**
1232 **checklist**

1233

1234 **Acknowledgement**

1235 To all study participants in Magude district, we are deeply thankful for accepting to participate
1236 in this study and sharing their experiences and views with us. We also address our thanks to
1237 the data field team (field supervisors, data collectors and transcribers), and all those that made
1238 the reactive focal mass drug administration possible.

1239

1240 **References**

- 1241 1. World Health Organization. World Malaria Report 2018. Geneva: World Health
1242 Organization. 2018. [Cited 7 September 2021]. Available from:
1243 <http://apps.who.int/iris/bitstream/handle/10665/275867/9789241565653-eng.pdf>
- 1244 2. World Health Organization. World Malaria Report 2019. Geneva: World Health
1245 Organization. 2019. [Cited 7 September 2021]. Available from:
1246 <https://apps.who.int/iris/bitstream/handle/10665/330011/9789241565721-eng.pdf>
- 1247 3. Ministério da Saúde (MISAU). Plano Estratégico de Malaria 2017-2022. Maputo: MISAU.
1248 2017.
- 1249 4. Moonasar D, Maharaj R, Kunene S, Candrinho B, Saute F, Ntshalintshali N, et al. Towards
1250 malaria elimination in the MOSASWA (Mozambique, South Africa and Swaziland) region.
1251 Malar J. 2016; 15.
- 1252 5. Galatas B, Saúte F, Martí-Soler H, Nhamussua L, Simone W, et al. A multiple program for
1253 malaria elimination in southern Mozambique (the Magude project): A before-after study.
1254 PLoS ONE. 2020; 17(8): e1003227. <https://doi.org/10.1371/journal.pmed.1003227>
- 1255 6. World Health Organization, Global Malaria Programme. Global technical strategy for
1256 malaria, 2016-2030. 2015. [Cited 7 September 2021] Available from:
1257 http://www.who.int/malaria/areas/global_technical_strategy/en/
- 1258 7. Galatas B, Nhamtumbo H, Soares R, Djive H, Murato I, Simone W, et al. Community
1259 acceptability to antimalarial mass drug administration in Magude district, southern
1260 Mozambique: A mixed method study. PLoS ONE. 2021; 16(3): e0249080.
1261 <https://doi.org/10.1371/journal.pone.0249080>
- 1262 8. Aide P, Candrinho B, Galatas B, Munguambe K, Guinovart C, Luis F, et al. Setting the scene
1263 and generating evidence for malaria elimination in Southern Mozambique. Malaria Journal.
1264 2019; 18:190. <https://doi.org/10.1186/s12936-019-2832-9> PMID: 31170984.

- 1265 9. Portugaliza HP, Galatas B, Nhantumbo H, Djive H, Murato I, Saúte F, Aide P, Pell C,
1266 Muguambe K. Examining community perceptions of malaria to inform eliminations efforts in
1267 southern Mozambique: a qualitative study. 2019; 18: 232. [https://doi.org/10.1186/s12936-](https://doi.org/10.1186/s12936-019-2867-y)
1268 [019-2867-y](https://doi.org/10.1186/s12936-019-2867-y)
- 1269 10. Cirera L, Galatas B, Alonso S, Paaijmans K, Mamuquele M, Martí-Soler H, Guinovart C,
1270 Munguambe H, Luis F, Nhantubo H, et al. Moving towards malaria elimination in southern
1271 in Mozambique. Cost and cost-effective of mass drug administration combined with
1272 intensified malaria control. PLoS ONE. 2020; 15(7): e:0235631.
1273 <https://doi.org/10.1371/journal.pone.0235631>
- 1274 11. World Health Organization. Mass drug administration for falciparum malaria: a practical field
1275 manual. Geneva: World Health Organization. 2017. [Cited 7 September 2021]. Available
1276 from: <https://apps.who.int/iris/handle/10665/259367>
- 1277 12. Instituto Nacional de Estatística (INE). IV recenseamento geral da população e habitação.
1278 Censo 2017. Maputo: INE; 2020.
- 1279 13. Ministério de Administração Estatal (MAE). Perfil do Distrito de Magude. Maputo: MAE;
1280 2005.
- 1281 14. Galatas B, Nhacolo A, Martí-Soler H, Munguambe K, Jaimise E, Guinovart C, et al.
1282 Demographic and health community-based surveys to inform a malaria elimination project in
1283 Magude district, Southern Mozambique. BMJ Open. 2020; 10: e033985.
1284 <https://doi.org/10.1136/bmjopen-2019-033985>.
- 1285 15. Ndimba SD, Sidat M, Give C, Ormel H, Kok MC, Taegtmeier M. Supervision of community
1286 health workers in Mozambique: a qualitative study of factors influencing motivation and
1287 programme implementation. Human Resources for health. 2015; 13:63.
1288 <http://doi.org/10.1186/s12960-015-0063x> PMID: 26323970.
- 1289 16. Arroz JAH. Social and behaviour change communication in the fight against malaria in
1290 Mozambique. Rev Saúde Pública. 2017; 51:18. [http://doi.org/10.1590/S1518-](http://doi.org/10.1590/S1518-8787.2017051006360)
1291 [8787.2017051006360](http://doi.org/10.1590/S1518-8787.2017051006360) PMID: 28355338.

- 1292 17. Kisoka WJ, Simonsen PE, Malecela MN, Tersøl BP, Mushi DL, Meyrowitsch DW. Factors
1293 influencing drug uptake during mass drug administration for control of lymphatic filariasis in
1294 rural and urban Tanzania. PLoS ONE. 2014; 9(10): e109316.
1295 doi:10.1371/journal.pone.0109316
- 1296 18. Baltzell K, Maglior A, Bangu K, Mngadi N, Prach LM, Whittemore B, Ntshalintshali N,
1297 Saini M, Dlamini N, Kunene S, Hsiang MS. “We are afraid of the lion that have roared next
1298 to us”; community response to reactive focal malaria mass drug administration for malaria in
1299 Eswatini (former Swaziland). Malar J. 2019; 18:238. [https://doi.org/10.1186/s12936-019-](https://doi.org/10.1186/s12936-019-2077-9)
1300 [2077-9](https://doi.org/10.1186/s12936-019-2077-9)
- 1301 19. Pell CL, Adhikari B, Myo Thwin M, Kajeechiwa L, Nosten S, Nosten FH, et al.
1302 Community engagement, social context and coverage of mass antimalarial
1303 administration: comparative find from multi-site research in the Greater Mekong sub-
1304 Region. PLoS ONE. 2019; 14: e0214280.
- 1305 20. Jaiteh F, Masunaga Y, Okebe J, D’Alessandro U, Balen J, Bradley J, et al. Comparative
1306 perspective on treating asymptomatic infection for malaria elimination in the Gambia.
1307 Malar J. 2019; 18:39.
- 1308 21. Fehr A, Niet-Sanchez C, Muela J, Jaiteh F, Ceesay O, Maneh E, Baldeh D, Achan J,
1309 Dabira E, Cinteh B et al. From informed consent to adherence: factors influencing
1310 involvement in mass drug administration with ivermectin for malaria elimination in the
1311 Gambia. Malar J. 2021; 20:198. <http://doi.org/10.1186/s2936-021-03732-z>
- 1312 22. Dierickx S, Gryseedls C, Mwesigwa J, O’Neill S, Bannister-Tyrrell M, Ronse M, et al.
1313 factors associated with non-participation and non-adherence in direct observed mass
1314 drug administration for malaria in The Gambia. PLoS One. 2016; 11: e0148627.
- 1315 23. Dierickx S, O’Neill S, Gryseedls C, Immaculate Anyango E, Bannister-Tyrrell M,
1316 Okebe J, et al. Community sensitization and decision-making for trial participation: a
1317 mixed-methods study from the Gambia. Dev World Biorth. 2018; 18:406-19.

- 1318 24. Jaiteh F, Okebe J, Masunaga Y, D'Alessandro U, Achan J, Grietens C, de Vries D,
1319 Ribera JM, Grietens KP. Understanding adherence to reactive treatment of
1320 asymptomatic malaria infection in the Gambia. 2021; 11:1746.
1321 <https://doi.org/10.1038/s41598-021-81468-1>
- 1322 25. Wanzira H, Naiga S, Mlebeke R, Bukenya F, Nabukenya M, Omoding O, Echodu D,
1323 Yeka A. Community facilitators and barriers to a successful implementation of mass
1324 drug administration and indoors residual spraying for malaria prevention in Uganda: A
1325 qualitative study. Malar J. 2018; 17:474. <https://doi.org/10.1186/s12936-018-2624-7>
- 1326 26. Dhiman S. Are malaria elimination efforts on right track? Analysis of gains achieved
1327 and challenges ahead. Infection diseases of poverty. 2019; 8:14.
1328 <https://doi.org/10.1186/s40249-019-0524-x>
- 1329 27. Pell C, Tripura R, Nguon C, Cheah P, Davoeung C, Heng C, Dara L, Sareth M, Dondorp A,
1330 Seidlein L, Peto TJ. Mass anti-malarial administration in western Cambodia: a qualitative
1331 study of factors affecting coverage. Malar J. 2017; 17:206. DOI: 101186/s12936-017-1854-4.
1332
1333

Subject: Submission of the revised manuscript [PONE-D-22-12696]

Dear editor and reviewers,

Thank you for reviewing our manuscript “Acceptability and perceived barriers to reative mass focal drug administraction in the context of malaria elimination program in Magude district. Southen Mozambique: a qualitative study”. The authors of this manuscript have read the comments and suggestions, and agreed to accept the recommedned conditions. All authors have also read and agreed upon the submitted version of the manuscript.

To the Editor:

In addition to the minor comments from the reviewers, I realized the authors have used over 30 pages to describe their results. It is important that the authors re-summarize these findings. I have also attached a marked-up revised copy for other comments.

[Answer: The authors re-summarized the findings, and only the essential quotations were left. The new revised manuscript has 28 pages.](#)

If you would like to make changes to your financial disclosure, please include your updated statement in your cover letter.

[Answer: The authors added some data related to financial disclosure, but this did not change the statement at all. We have included the new text of financial disclosure in the cover letter.](#)

Answer to the Reviewer #1:

- Typographic error in the manuscript:

[Answer: all typographical errors identified were addressed. Moreover, the authors reviewed the whole manuscripts and corrected all possible grammatical errors.](#)

- **Results:** Please adapt your tables with examples of PLOS ONE tables. Put full stops too at decimal places and not commas. % is written above and not all over the tables.

[Answer: all tables were revised and formatted according to PLOS ONE tables, as presented in the new revised manuscript.](#)

Abstract

1. "The reactive focal mass drug administration (rfMDA) was implemented July 2017 to January 2020". Authors should include in the abstract at what period between July 2017 to January 2020 was study conducted.

Answer: The authors included the period that the study was conducted in the abstract, which was between June and September 2017.

Methods

1. In Galatas et al. 2021 in "Community acceptability to antimalarial mass drug administrations in Magude district, Southern Mozambique: A mixed methods study", a population of 48,448 residents, and 10,965 households was provided for a study done during rounds of MDA between November 2015 to February 2017. In this study also conducted in 2017, authors present a population of 63,691 inhabitants and 14,583 households.

Can authors give explanation to the difference in population number in studies done within same period?

Answer: Since the start of the project, the CISM conducted annual census in the district, and Galatas et al. (2021) reported the population of the local census of 2016. However, in the paper, we used the census of the National Institute of Statistic (INE) of 2017 rather than local census because the CISM did not conduct the 2017 local census. We therefore, decided to use the census of INE because we think it is updated compared to the 2016 local census.

2." The study was undertaken in September 2017 before the start of the reactive surveillance intervention and continued during the first two months after the start of the intervention".

a. The above contradicts the initial mention that rfMDA started in July 2017. If the people of Magude district did not benefit from intervention until after September 2017, authors should explain this in the Introduction to support what was mention in the Methods section. Otherwise, corrections should be made in the Methods (Study setting) section to agree with the earlier mention.

Answer: Indeed, there was an error in the text regarding the period of the study and the start of rfMDA intervention. The correct information is that the study was conducted between June and September 2017, while the rfMDA program started in September 2017. We have corrected this information in the revised manuscript.

b. In the Methods section (Study setting), authors should state the duration of study. That is, from September 2017 to when, 2018?

Answer: There was also an error in this section about the study period. The correct information is: the study was conducted between June and September 2017.

3. "...distributed in 5 Administrative Posts: Magude village, Motaze, Mahele, Panjane and Mapulanguene, and the study covered all these 5 Administrative Posts". In Table 1, some administrative units lacked participants bearing in mind that purposive sampling was employed. Can authors give reasons why some units lacked participants?

Answer: The study sample size did not cover all participants in all study sites due to unequal distribution of the study participants' categories and several constraints to accessing the eligible participants. Health professionals and CHWs were not included in some study sites because they were not in all selected communities, and some community leaders were absent during the data collection. Additionally, it was not possible to include adolescents from Mahele and Mapulanguene because the study took place during the school season, and the eligible participants were at schools in different districts. Furthermore, members of the community from Mahele were not included in the sample of semi-structured interviews because they were unavailable due to their agricultural activities. In addition, the lack of accessibility at the selected study sites during the rainy season constrained the eligible participants' access. Moreover, the data collection strategy used also contributed to unequal distribution of the participants in the study setting. The study started by conducting focus group discussions (FGDs) in all study settings and later carrying semi-structured interviews. While FGDs were conducted during late months of dry season, the semi-structured interviews were conducted during the start of rainy season, which constrained access to participants in some study settings (Administrative post of Motaze, Mahele and Mapulanguene). We have added an explanation of the sample distribution in the revised manuscript (page 10 of the revised manuscript with track changes).

4. Was the semi-structured interview questionnaire used pre-piloted?

Answer: Yes, all guides were pre-piloted as started in line 205, page 11 of the revised manuscript with track changes.