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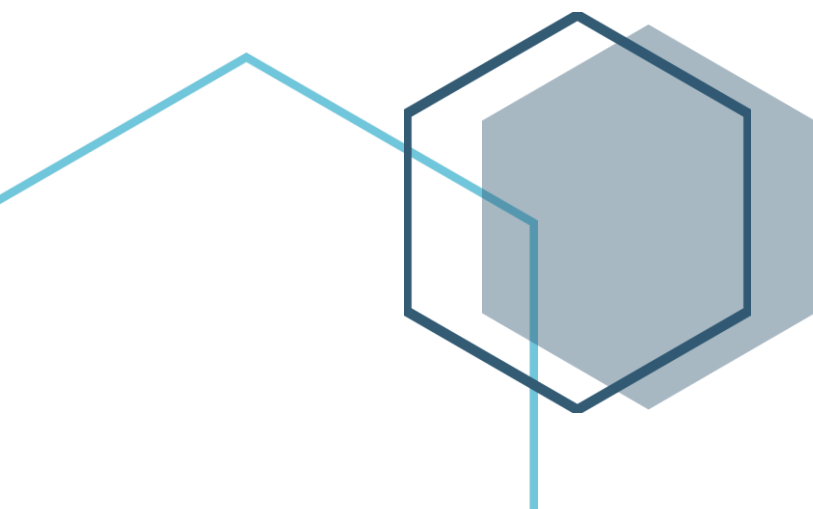


End-user perception and preference of 'End-user facing'
oral medicines / formulations used to treat young
children: a survey of caregivers and children under 12
years of age in Cameroon

Final report of the Study

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Principal investigator

Prof. Joseph Kamgno, MD, PHD

Centre de Recherche sur les Filarioses et Autres Maladies Tropicales

BP: 5797

Yaoundé Cameroun

Tél: 00237 677 789 736

kamgno@crfilmt.org

Co-investigator

Prof. Dr. med. Achim Hoerauf

Prof. Hannah Batchelor

Dr. Michel Vaillant

Associate investigator

Guy Wafeu (MD, MPH student)

Christelle Andoseh (Anthropologist)

Study site

Cameroon

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List of abbreviations

CDD: Community Drug Distributor

FGD: Focus Group Discussion

HD: Health District

IDI: In-Depth Interview

MDA: Mass Drug Administration

MDA: Mass Drug administration

NTDs: Neglected tropical diseases

WHO: World Health Organization

Summary

Context: Preventive chemotherapy through Mass drug administration is a key element in the fight against NTDs. Among the 47 drugs recommended by WHO against NTDs, only 15% are available in paediatric formulations. However, there is high burden of NTDs in children, with more than 0.5 billion children affected each year by NTDs, with 50 million children affected with hookworm alone in Sub Saharan Africa. Moxidectin is a relatively new drug with longer and stronger effect on *Onchocerca volvulus* than ivermectin, and represent therefore a good alternative to ivermectin to accelerate the elimination of onchocerciasis. However, there is no paediatric formulation available so far for children below 12 years.

Objective: This study, which is a second work package of a global paediatric moxidectin development project, aimed to assess 'End-user' preferences and opinions about oral medicines / formulations used to treat young children.

Method: We conducted from July 2021 to February 2022 a mixed qualitative and quantitative study design in four rural health districts endemic to onchocerciasis in four Cameroonian regions (West, Centre, Adamawa and Littoral). Participants were mothers, caregivers, Community drug distributors (CDDs), other community members, and children aged between 06 and 12 years. A random sampling method was used for the quantitative arm, while a purposive sampling method was used for the qualitative arm. Perception and acceptability of formulations were assessed with an adapted version of the paediatric oral medicines acceptability questionnaire, with a focus on chewable and orodispersible forms (The two possible forms of paediatric moxidectin).

Results: Overall, 508 questionnaires were filled, 119 in-depth interview and 20 focus group discussions were done. From the quantitative aspect, it was shown that tablets and syrups are the more commonly used formulation for children in rural area, experienced by 90.9% and 68.3% of participants. Chewable and orodispersible are scarcely used in communities, respectively by 64.4% and 23.0% of participants. Characteristics were scored out of 5, with 0 being the most difficult and 5 the easiest. Regarding difficulty in swallowing, the orodispersible and chewable forms have the same score of 3.7, which reflects a moderate difficulty in swallowing the drug. About 78% of the participants stated that they/their children would like or like very much to take a medicine in either the orodispersible or chewable form. However, the mean scores for these two formulations were 3.99 ± 0.9 and 3.84 ± 0.9 for the orodispersible and chewable forms respectively. Regarding the difficulty of taking the

medication, 74.8% of the participants found the chewable tablet form easy or very easy, while 77.8% thought the same for the orodispersible form. The mean score was 3.83 ± 0.9 for the chewable tablet form and 4.04 ± 1.0 for the orodispersible form.

From the qualitative research, it comes out that orodispersible form was preferred to chewable, as it seems easier to be administered, especially for younger children. Moreover, the taste of the drug must be “good” or sweet to attract children. We also observed a wrong perception of tablets (including orodispersible formulation), stating that they can lead to gastric diseases in children. Several challenges encountered during drug distribution campaigns were identified, including the refusal to take the drug for several reasons, the fear of adverse events, absence of family's members or parents during MDA and unawareness of the days of campaigns in the communities.

Conclusion: These results will inform the selection of the best formulation (orodispersible) of moxidectin, and will be used to design sensitization messages in targeting wrong perception of the drug formulation.

Background and rationale

Background

Neglected tropical diseases (NTDs) are a diverse group of communicable diseases that mostly affect people in tropical and subtropical climatic zones. These infections - largely associated with lower socioeconomic status- are highly prevalent both in rural and poor urban settings of low- and middle income countries [1]. According to WHO, there are 20 NTDs (of which 19 are infectious diseases) which affect about 2 billion people and lead to 200 000 – 500 000 deaths per year worldwide. The most prevalent NTDs are soil-transmitted helminthiasis (ascariasis 804.4 million cases, trichuriasis 477.4 million cases, and hookworm 471.8 million cases), schistosomiasis (290.6 million cases), and food-borne trematodiasis (80.2 million cases). Together, NTDs represent a loss of 25.1 million disability adjusted-life years, 16.9 million years lived with disability, and 8.21 million years of life lost [2]. These figures may even be underestimated as affected individuals tend to be poor with low access to health care, thus many cases go unreported. These diseases heavily affect paediatric populations as about 0.5 billion children are affected each year worldwide and as many as 50 million children are infected with hookworm alone in sub-Saharan Africa [1,3]. Furthermore, children are often infected with multiple parasitic NTDs with significant morbidity even for low-intensity infections [4].

Preventive chemotherapy through mass drug administration is one of the key elements in the fight against NTDs. It is the public health strategy recommended by WHO against various NTDs, including lymphatic filariasis, onchocerciasis, schistosomiasis and soil transmitted helminthiasis [5]. This strategy has demonstrated its effectiveness. For example, Ivermectin annual MDA permitted the interruption of transmission of human onchocerciasis in two states of Nigeria [6]. However, despite the burden observed both in adults and children, paediatric formulations are available only for a limited number of drugs against NTDs. A recent review of clinical trials on NTDs drugs with a focus on paediatric formulation reported that only 17% of phase 2-4 trials for NTDs were paediatric trials. Among 47 medications recommended by WHO for treatment of NTDs, 22 (47%) were adequately labelled for use in children, with only 8 (17%) for use in infants and children less than 2 years, and 8 (15%) were available in paediatric formulations [7].

Rationale

Moxidectin is a semi-synthetic macrocyclic lactone of the milbemycin class of macrolide antibiotics. It has stronger and longer effect on *Onchocerca volvulus* than ivermectin. A phase III clinical trial including 1 472 participants aged ≥ 12 years and infected with *O. volvulus* shows that Moxidectin at 8mg resulted in lower skin microfilarial loads than ivermectin at 1-, 6-, 12- and 18-months follow-up times. Furthermore, the proportion of participants with undetectable skin microfilariae in the moxidectin group was higher compared to ivermectin group 12 months after treatment. Moxidectin may therefore represent a better alternative to ivermectin in the fighting against onchocerciasis and other NTDs which can be treated by those drugs. To date, there is no paediatric formulation of moxidectin. In the process of developing and evaluating a paediatric formulation, it seems reasonable to identify the formulation characteristics preferred by children and caregivers, in order to ensure a better adherence to treatment. We intend to assess the preferences and opinions of children, parents and caregivers concerning the different drug formulations they have experienced in the past, in order to inform the development of paediatric formulation of moxidectin and globally decision-making in paediatric drugs formulations for developing countries.

Objectives

Primary objective

To assess 'End-user' preferences and opinions about oral medicines / formulations used to treat young children, with a focus on chewable and orodispersible formulations.

Secondary objectives

To describe challenges in storage and mass administration of various paediatric formulations in rural settings.

Methods

Study design

This was a mixed quantitative and qualitative study design.

Quantitative arm

The quantitative part was a cross-sectional survey with the administration of a questionnaire to parents, caregivers, and other community members. The questionnaire contained closed answer questions with a 5-points numeric scale (ranging from “not at all acceptable” to “very acceptable”) for each question. The questions assessed the experience of participants from previously used formulations. Another aspect of the quantitative part was to assess the acceptability to children of different formulations, using a visual presentation and description of those formulations, with a visual scale measuring the child’s attitude. For each formulation, the child’s attitude was evaluated with a 3-components scale, namely the affective component (whether the dosage form was liked or disliked), behavioural component (willingness to take the dosage form) and cognitive component (whether the dosage form was perceived as easy or difficult to take); a 5-points scale with visual symbols was used for each component [8]. See Appendix for an example of description of formulations and the 3-component scale.

Qualitative arm

This part was used to describe the experience and preferences of parents, caregivers and other community members towards different paediatric formulations. In-depth interviews were conducted with key community and familial stakeholders, using an interview guide (see appendixes). Thereafter, focus group discussions (FGD) were organized to capture the perception of community members as a group, concerning the different paediatric formulations. The constructs of acceptability used for in-depth interviews and FGD were adapted from the theoretical framework of acceptability, which include affective attitude (how an individual feels about the formulation), burden (the perceived amount of effort that is required to use the formulation), ethicality (the extent to which the formulation has good fit with an individual’s value system), the formulation coherence (extent to which the participant understands the formulation characteristics), opportunity costs (extent to which benefits,

profits or values must be given up to engage in the use of formulation) and perceived effectiveness (extend to which the formulation is perceived as likely to achieve its purpose) [9]. Interviews and FGD were also used to assess the challenges that may be related to the implementation of MDA campaigns using each formulation, especially in storage and administration of the drug.

Study site

The study was conducted in four (04) rural health districts where onchocerciasis is endemic in Cameroon. In order to have a representative sample of Cameroonian children, one health district (HD) was selected among the onchocerciasis endemic HD in each of the four major bioecologic group of the country, namely the Sahelians (Far north, north and Adamaoua regions), the Coastal and forest peoples (Littoral and south west region), the “grass-field” (West and North west regions) and the forest peoples (Centre, East and south regions). A purposive sampling method considering the culture and habits of inhabitants permit us to select Soa HD (Centre region), Tignere HD (Adamawa region), Penka-Michel HD (West region) and Yabassi HD (Littoral Region). In each of these HD, 05 health areas or villages were purposively selected with the district staff when the study was launched.

Study population

We included in this study an adult population and children. Adults were participants of 21 years and above who were in one of the following groups: female parents, caregivers, community drug distributor (CDD), traditional administrative, and other influential community members identified with the participation of the community. To be included as parent, the participant should be a woman who have been in charge (responsible for nutrition, housing and drug administration) of at least one child under 12 years during the past 12 months at the time of inclusion. Caregivers were subjects working in local health facilities (either private or public), who were responsible for prescription and/or administration of drugs to children under 06 years. CDD should have their name on the CDD list provided by the health district staff. Children were involved only in the quantitative component of the study. To be selected as participant to this study, a child should be aged between 03 and 12 years, reside in the community at the time of inclusion, and must have received at least one oral drug during the

past 12 months. Prior to inclusion, a written informed consent was obtained from adults and from children's parents, as well as the assent of children included.

Sampling

Sampling method

Four Health districts were purposively sampled among the onchocerciasis endemic health district, with one HD selected in each of the four major ethnic group of the country. Thereafter, 10 communities or health areas were selected in each HD in agreement with the district staff.

Quantitative arm

In each community, parents and children were selected through a systematic random sampling of household. At the main crossroad of the community, one way was randomly chosen and households were selected with a sampling step of 05. When the team arrived in the household, inclusion criteria for parents and children were verified. If there was no parent nor children fulfilling the criteria, the next household was assessed until a suitable household is found. Thereafter, the sampling step was applied. In each household selected for inclusion, only one parent was included in the study, as well as all the eligible children. Caregivers and CDD were also randomly selected among all those who were working in the community.

Qualitative arm

For the qualitative arm, a purposive sampling method was used to identify key informants among parents, caregivers, CDD, local stakeholders and other influent community members. They were selected in agreement with communities' authorities.

6.2. Sample size

For the quantitative aspect of the study, the sample size was estimated to compare the proportion of individuals (Children, parents and caregivers) reporting willingness to use each of the dosage forms (chewable or oral dispersible form), with a type I error of 5%, a type II error of 20%. The expected difference was obtained from a study conducted by Ranmal et al., where 80.1% of school age children reported the willingness of using the chewable dosage form while 69.7% of these children reported the willingness of using the oral dispersible form [8]. The minimal sample size was therefore estimated at 407 individuals,

which were rounded up to 500 participants. As the study were conducted in 20 communities (5 communities in each of the 04 Health Districts), 25 participants were included from each community: 14 Children, 06 parents, 02 CDD and 03 caregivers.

For the qualitative arm, 08 participants were selected in each community for a focus group discussion, and 07 other (two parent, one caregiver, one CDD, one local authority, and two influent members of the community) for in-depth interviews, giving at total of 15 participants. For the whole study 300 subjects (15 per community, 05 communities per Districts, 04 Districts) were to be included for 20 FGD of 08 participants per group, and 140 in-depth interviews. Table 1 summarize the sample size for the different aspects of the study.

Table 1 : Sample size estimation for the different aspects of the study

Arm	Participants	Number per community	Number of communities	Total number of participants
Quantitative arm	Parents	06	20	120
	Children	14	20	280
	CDD	02	20	40
	Caregivers	03	20	60
	Sub-total			500
In-depth interview				
Qualitative arm	Parents	02	20	40
	CDD	01	20	20
	Caregivers	01	20	20
	Local authorities	01	20	20
	Other influent members	02	20	40
FGD				
	Community members	08	20	160
	Sub-total			300
Total				800

Data collection

Quantitative arm

Quantitative data on experience from past drug administered to children under 06 years were obtained from parents, caregivers, CDD, and children who were able to answer the questions. Prior to data collection from an adult, the study was explained and answers provided to all his questions, and the written inform consent was obtained (Appendix 2 and 3). For children (who were aged between 06 years and 12 years), the study was explained both to the parent and the child in simple words they could understand. To be included in the study, the assent of the child and the written parental consent (Appendix 4 and 5) were obtained. Data were collected on a pre-designed and pre-tested questionnaire, adapted from the Paediatric Oral Medicines Acceptability Questionnaires [10]. The following key attribute concepts were assessed on a 05-points numerical scale for each of the drug formulation children have been exposed to: (i) swallowability, (ii) texture or mouthfeel, (iii) overall happiness with the medicine, (iv) willingness to keep taking the medicine, (v) ease of intake, (vi) overall perception (see appendix for more details on the questionnaire).

For the assessment of opinions and attitude towards chewable and oral dispersible formulations, we used pictures (done with black child) and description of these formulations (see figure 2) to evaluate the estimated affective component (like or dislike), estimated cognitive component (easy or difficult to take) and the estimated behavioural component (willingness to take for children or to administer for parents and caregivers). Each of these component were evaluated with a 5-point tripartite scale, as described by Ranmal et al [8]. These data were collected from all the children included in the study, their parents, CDD and caregivers.

Qualitative arm

This qualitative arm concerned parents only, and no children was included in this arm. With respect to data collection, qualitative method of research was used for data collection. Qualitative research technics used for data collection were be as follows: FGD and in-depth Interviews.

Data collection Tools were used for data collection are as follows: in-depth interview guide (it was used for parents, care takers, members of the community, CDDs), focus group discussion guide (it was used only for FGD in the field).

Data collection procedures were used in the field for data collection. Two (2) procedures were used for data collection in the field, they are as follows: field work procedure and language procedure.

- Field work procedure: it consisted of identifying informants (parents, care givers, members of the community and CDD's). Secondly, contacting these informants about this research. Thirdly, an interview time schedule was organized and the places where the interviews had to take place were chosen at their convenience. Lastly, we pre-informed our informants about the purpose of the research. Our interview guide contained open questions. Informed consent form was presented to each Informant or participant partaking in the research in the field.
- Language procedure: it was used for data collection in the field. It consisted of Interviews which were conducted both in English or French depending on the first language of participants, with the use in-depth interviews and FGD guide. Our guides were written both in English and in French. For participants who could not understand French or English, a CDD served as translator from French (or English) to the local language and vice versa. The translation was also used to obtain the consent (and the translator served as witness).



Figure 1: Picture of drug formulations and descriptions used in the field for data collection.

Data analysis and interpretation

Data of the quantitative arm were collected and entered in a data entry application designed in Census and Survey Processing System (CsPro). Continuous data were summarized with mean \pm Standard deviation for normal distributed, while categorical data were described with number and percentages. In order to compare the acceptability of the different formulation, Quantitative data were compared with the repeated measure analysis of variance (ANOVA) for normal distributed. Quantitative data were analysed with IBM Corp. Released 2020. IBM SPSS Statistics for Windows, Version 27.0. Armonk, NY: IBM Corp.

For the qualitative research, data analysis will be carried out with QDA Miner lite software. All data obtained were transcribe by researchers and analyzed. All in-depth interviews carried

out with the use interview guide, interview guide for Focus Group Discussion and were recorded, transcribed and coded into the computer. We read through the field work notes, transcript documents and other information's obtained from the field. The next step was based on data marking or coding that was based on bringing out the similarities, contrasting points of view and points that stood out uniquely. We went further by searching for emerging themes and looking for the local categories of meaning. There was equally the triangulation of qualitative data collected from the field; these were done across the use of various techniques which was applied in data collection.

Ethical consideration

Consent and ethical clearance

An ethical clearance was obtained from the Cameroon Bioethics Initiative (CAMBIN) Ethics Review and Consultancy Committee (ERCC) with the reference number CBI/468/ERCC/CAMBIN. Prior to inclusion, a written inform consent was obtained from adult participants. For children, the consent was obtained from parents, with the assent of the child. An information sheet about the study was given to all the participants and the inform consent form was signed in two copies, with one copy provided to the participants or their parents (for children). Participants were free to accept or refused to participate with no consequence if they refused. Data were managed confidentially, and the whole study was conducted in accordance with the Helsinki principles of research involving humans [11].

Risk and benefits

The main benefit for participant was that they contributed to the knowledge of drug formulation preference in their community and in Cameroon in general. A very important outcome of this study has been the contribution to the development of a new drug for the fight against neglected tropical diseases, namely Moxidectin.

There was almost no risk while participating in this study. No sample was taken and no drugs were administered. However, participants spend approximately one hour of their time answering questions or participating in the group discussion.

Confidentiality and data management

Each participant was assigned a code for his questionnaire. The confidentiality of this study was ensured by the use of these codes for all participants. During FGD, a "responder number"

was attributed to each participant and that number was stated at the beginning of each speech in order to keep the participant's identity confidential. All original documents containing the names of the participants were kept under lock and key in the principal investigator's office and were accessible only to the appropriate research team members. Data collected (including recordings of interviews and FGD) will be retained for at least 10 years and may be used for other studies.

Compensation

There was no financial compensation for participants in this study.

Results

Overall, 508 questionnaires were filled, 119 in-depth interview and 20 focus group discussions were conducted.

Quantitative arm

Characteristics of study participants and type of drug formulations used

Table 2: Characteristics of study participants

Variables	Numbers	Percentages
Health districts		
Tignere	126	24.8
Soa	135	26.6
Yabassi	122	24.0
Penka-Michel	125	24.6
Type of Key informants		
Parent	130	25.6
CDD	33	6.5
Health workers	55	10.6
Children	290	57.1
Gender		
Male	172	33.9
Female	336	66.1

About one fourth of participants were recruited from each of the four health districts. Most of the participants were children (57.1%), while CDD were less than 10%. The mean age of the parents was 37.9 ± 12.3 years, the mean age of the CDDs was 40.6 ± 13.2 years, the mean age of the health personnel was 35.3 ± 9.4 years and the mean age of the children was 9.4 ± 4.7 years.

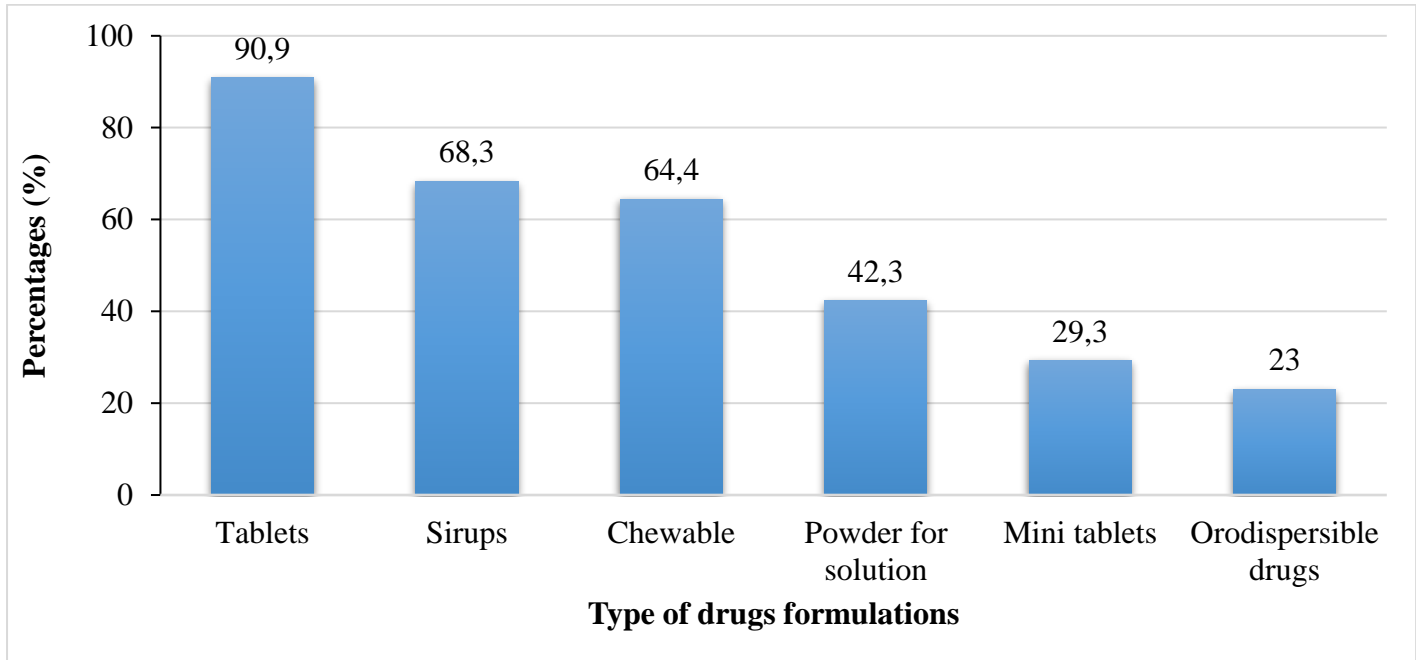


Figure 2: Description of drug formulations previously used by study participants.

Tablets and syrups were the most commonly used formulations with respectively 90% and 68% of participants which have used it previously. Furthermore, Chewable formulation was more common (64%) than orodispersible drugs (23%).

Table 3: Description of swallowability of drug formulations according to informants' groups

Drug formulation	Group of informants					P value
	Overall	Parents	CDD	Health workers	Children	
Syrups	4.02 ± 0.9	4.05 ± 1.1	4.23 ± 0.8	3.62 ± 0.9	4.08 ± 0.9	0.009
Tablets	3.03 ± 1.2	2.72 ± 1.2	2.55 ± 1.1	2.15 ± 1.02	3.39 ± 1.2	< 0.001
Orodispersible	3.79 ± 1.1	3.92 ± 1.01	3.17 ± 1.4	3.11 ± 1.2	4.01 ± 0.9	< 0.001
Powder for solution	3.88 ± 0.95	3.93 ± 0.9	3.93 ± 0.8	3.46 ± 1.01	3.98 ± 0.9	0.008
Chewable	3.70 ± 1.1	3.66 ± 1.2	3.48 ± 1.2	3.04 ± 1.4	3.88 ± 0.9	< 0.001
Mini tablets	3.77 ± 0.9	3.95 ± 0.8	2.75 ± 1.0	2.96 ± 1.2	3.99 ± 0.8	< 0.001

This table describes the mean score assessing the difficulty of swallowing the different formulations. This score is scored out of 5, with 0 being the most difficult and 5 the easiest.

With regard to difficulty in swallowing, the orodispersible and chewable forms have the same score of 3.7, which reflects moderate difficulty in swallowing the drug. The syrup form had the highest score for ease of swallowing, while the tablet form had the lowest score for difficulty.

Table 4: Description of texture or mouthfeel of drug formulations according to informants' groups

Drug formulation	Group of informants					P value
	Overall	Parents	CDD	Health workers	Children	
Syrups	3.88 ± 0.9	3.92 ± 0.9	3.97 ± 0.8	3.42 ± 0.9	3.97 ± 0.9	0.001
Tablets	2.44 ± 1.0	2.41 ± 1.1	2.61 ± 1.1	2.05 ± 0.8	2.51 ± 1.1	0.021
Orodispersible	3.62 ± 0.9	3.66 ± 0.9	3.06 ± 1.1	3.14 ± 1.0	3.81 ± 0.8	< 0.001
Powder for solution	3.62 ± 0.9	3.68 ± 0.9	3.75 ± 0.7	3.26 ± 0.9	3.69 ± 0.9	0.016
Chewable	3.68 ± 1.0	3.67 ± 0.9	3.64 ± 1.1	3.36 ± 1.1	3.75 ± 0.9	0.078
Mini tablets	3.27 ± 0.8	3.44 ± 0.8	2.81 ± 0.8	2.67 ± 0.8	3.39 ± 0.8	< 0.001

This table present the mean score assessing texture or mouthfeel of drug formulation. This is a score out of 5, with 0 been not happy at all for the texture and 5 been very happy for the texture.

The overall mean value of the score was similar for chewable and orodispersible (3.6)

Table 5: Description of ease of intake of drug formulations according to informants' groups

Drug formulation	Group of informants					P value
	Overall	Parents	CDD	Health workers	Children	
Syrups	4.0 ± 0.8	3.93 ± 0.9	4.0 ± 0.8	3.69 ± 0.9	4.13 ± 0.9	0.010
Tablets	3.04 ± 1.1	2.67 ± 1.1	2.64 ± 1.0	2.22 ± 0.9	3.4 ± 1.03	< 0.001
Orodispersible	3.72 ± 0.9	3.28 ± 1.3	3.28 ± 1.3	3.27 ± 1.1	3.91 ± 0.8	0.001
Powder for solution	3.82 ± 0.9	3.84 ± 0.9	4.04 ± 0.7	3.40 ± 1.0	3.92 ± 0.8	0.003
Chewable	3.71 ± 1.1	3.58 ± 1.1	3.73 ± 0.9	3.15 ± 1.3	3.87 ± 0.9	< 0.001
Mini tablets	3.60 ± 0.9	3.69 ± 1.0	2.81 ± 1.1	2.81 ± 1.2	3.82 ± 0.8	< 0.001

This table describes the mean score assessing the difficulty of ingesting the different formulations. This score is scored out of 5, with 0 being the most difficult and 5 being the easiest.

As with difficulty in swallowing, the difficulty in ingesting the drug is similar for the chewable and orodispersible forms, with a mean score of 3.7. In contrast, the tablet form is the most difficult to swallow while the syrup form is the easiest to swallow.

Table 6: Description of the willingness to take the drug according to the formulation

Formulation	Would you / your child like or dislike the medicine				
	Don't like at all	Don't like	Neither like nor dislike	Like	Like a lot
Chewable	13 (2.6)	59 (11.6)	39 (7.7)	283 (55.7)	114 (22.4)
Orodispersible	6 (1.2)	51 (10.0)	54 (10.6)	229 (45.1)	168 (33.1)

About 78% of the participants stated that they/their children would like or like very much to take a medicine in either the orodispersible or chewable form. However, the mean scores for these two formulations were 3.99 ± 0.9 and 3.84 ± 0.9 for the orodispersible and chewable forms respectively.

Table 7: Description of the difficulty to take the drug according to the formulation

Drug formulation	How easy or hard would you / your child find chewable to take				
	Very hard	Hard	May easy or hard	Easy	Very easy
Chewable	7 (1.4)	63 (12.4)	58 (11.4)	261 (51.4)	119 (23.4)
Orodispersible	9 (1.8)	46 (9.1)	58 (11.4)	196 (38.6)	199 (39.2)

Regarding the difficulty of taking the medication, 74.8% of the participants found the chewable tablet form easy or very easy, while 77.8% thought the same for the orodispersible form. In terms of averages, it was 3.83 ± 0.9 for the chewable tablet form and 4.04 ± 1.0 for the orodispersible form.

Table 8: Description of the probability of taking the drug according to the formulation

Drug formulation	If the medicine only come as this formulation, are you / your child likely to take it?				
	Definitely would not	Probably would not	May be would or may be would not	Probably would	Definitely would
Chewable	3 (0.6)	44 (8.7)	20 (3.9)	155 (30.5)	286 (56.3)
Orodispersible	3 (0.6)	46 (9.1)	18 (3.5)	136 (26.8)	305 (60)

If a medicine came only in chewable or orodispersible form, almost 86% of the participants thought that they/their children would take the medicine and less than 10% thought that their children/they would not take the medicine. The mean score for this parameter was 4.33 ± 0.9 for the chewable tablet form and 4.37 ± 0.9 for the orodispersible form.

Qualitative arm

Preference and Opinions of the taste, smell and formulation of paediatric formulation of drugs in the form of Syrups

Based on the in-depth interviews carried out with, parents of children, traditional authorities, members of the communities, CDD's, health care givers and participants of FGD of Soa, Tignre, Penka Michel and Yabassi Health Districts, there are some children who generally do not like the taste of syrup. That is; they do not like things or drugs which have a sweet taste. Drugs like syrups which are in the liquid form and have a sweet taste are not easily taken by children. In addition to that, parents and Health Care Givers went further by explaining that, when these children are given this form of drugs, they will either spit it out or throw it off because of the sweet taste of the medication. Based on the data collected from the field, the colour of drugs does not have any meaning to parents of children. Below is the affirmation of a parent of children of Ntuisong, health Area, Soa Health District.

“syrup, they will not drink, they will come out and throw it outside. The liquid one they will put it in their mouth but they will come out and throw it outside despite the taste. (Parent of children, 27 years old, female, Ntuisong, Soa Health District, IDI, 30/9/2021)

Also, one of the Parents of children interviewed in Soa Health District gave her opinion on the experiences faced while giving drugs in the form of syrup to their children. She goes further by explaining that, drugs like syrup which are in the liquid form children refuse drinking it because of the sweet taste and its formulation. If children are given this form of medication, they will put it into their mouth but they will latter throw it out. It can be concluded that, no matter the formulation and the taste of the drug in the liquid form the child will not drink it easily. More also, the health care worker of Bonadissake Health Area, Yabassi Health District also affirms that, there are some children who do not like drugs in the form of syrup because of the sweet taste. Below is the presentation of the following statement:

“Syrup form, there are some children who do not like sweet things.” (Health Care worker, 40 years old, female, Bonadissake Health Area, Yabassi Health District, IDI, 7/10/2021)

More also, a participant of FGD that is: a parent of children affirms that, there are some children who do not like the taste of syrup which is sweet. Below is the following presentation of the parent of children of Bonadissake Health District:

“There are some children who do not like sweet things, even syrup they do not like” (Parents of children, 33 years old, female, Ntuisong Health Area, Soa Health District, FGD, 31/09/2021)

In addition to that, the health care giver and parents of children of Bonadissake Health area, Yabassi Health District and parents of children of FGD of Ntuisong Health Area, Soa Health District both explained that, there are some children who do not like sweet drugs most especially syrups. It is difficult to give children drugs which are sweet because they will not take it or they will throw it out. Below is the presentation of the following statement by the CDD of Galim Tignere, Tignere Health District.

“Little children usually have problems taking syrups because when they are sick, usually they are given syrup in the form of amoxi and other forms of drugs. They have the tendency of not liking syrups, when they see that syrup has been brought to them they do not want it. For that, they do not like syrups.” (CDD, 49 years old, male, Galim Tignere Health Area, Tignere Health District, IDI, 13/12/2021)

From the above explanation of the community drug distributor (CDD) of Galim Tignere Health Area, little children face the problem of taking drugs in the form of syrup when they are sick. Some children do not like syrup because of the taste of the drug.

More also, on the other hand, there are some parents of children, members of the communities, CDD's, traditional authorities and health care workers who made mention of the fact that, they preferred drugs in the form of syrup. Reason being that, it is easy to give to the child, it is in the liquid form and there are some children who love drugs which have a sweet taste. Also, concerning the formulation of the drug, informants and participants of FGD preferred drugs in the form of syrup because it comes already mixt and there is no need mixing the drug with water. More also, they preferred syrup for children below the age of 6 years because it is easy to give to the child, the sweet taste and flavour will attract the child even if it is bitter the child will drink it. Informants explained that, children generally like sweet things and when it is syrup they might take it to be a sweet drink. Secondly, some parents preferred syrup formulation because it comes already mixt and prevents parents from using non mineral water. They preferred syrup because with tablets children find it difficult to drink it or to swallow tablets. Below are the following statements.

“With syrup there is no problem based on what we encounter in the field. Why is there no problem with syrup? There is no problem because it is sweet and it passes very well in the mouth of children. Children generally loved what is a little bit sweet.” (CDD, 52 years old, Male, Bamendou Health Area, Penka Michel Health District, IDI, 24/01/2022)

From the above expression of the CDD of Bamendou Health Area, Penka Michel Health District, there is no difficulty encountered in the community while giving drugs in the form of syrup to children. Generally children love drugs which have a sweet taste. One of the main reason which pushes children to love drugs which are, it is the sweet taste of syrup and the drug passes very well in children's mouth. Below is the opinion of a parent of children which will be well elaborated.

“For syrup it does not disturb, when children see syrups they easily get interested and when it is a little bit sweet children love sweet things.” (Parents of children, 28 years old, female, Ntuisong Health Area, Soa Health Districts, IDI, 31/09/2021)

Following discussion with parent of children of Ntuisong Health Area, Soa Health District, syrup is not a disturbance to children and when syrup is seen by children they get interested in it most especially when it is a little bit sweet. Children love things which have a sweet taste. Below is the presentation of another parent of children of Libong Health Area, Tignere Health District will be enumerated.

“I prefer syrup because there are some which are sweet and when you give to the child, he will drink it.” (Parent of children, 45 years old, female, Libong Health Area, Tignere Health District, IDI, 18/12/2021)

Parent of children of Libong Health Area, Tignere Health District expressed the way they preferred drugs in the form of syrup most especially the once which have sweet taste. When giving to the child, the child will drink it without complicating because it's sweet taste and its liquid form formulation. More also, the last informant lays much emphasis on the taste and formulation of the children which is so much loved by children because of the sweet taste. Below is the following presentation:

“syrup is good, there are children who fear tablets. It is sweet and easy to give the child.” (Parents of children, 26 years old, Female, Yabassi (Banya) Health Area, Yabassi Health District, FGD, 11/10/2021)

Another aspect which came up so strongly from discussions with parents of children during FGD in Yabassi (Banya) health District was that of the taste and formulation of syrup for children below 6 years old. This informant went further by explaining the fact that, drugs in the form of syrup is good, most especially for children who fear drugs in the form of tablets. Also, it is believed that drugs in this form are sweet and it is easy to give to children below 6 years old. based on the findings obtained from the field, through informants and participants of FGD, there is the perception that drugs in the form of syrup is very good and easy to give

to children. In addition to that, parents of children believe that, this paediatric formulation taste sweet and the liquid formulation is good for children to drink since it is already diluted in the liquid form. To an extent some Parents of children expressed the fact that, they will accept and prefer this paediatric formulation for their children. From observation and discussions with parents of children and other members of the communities they are not interested in the colour of drugs to be given to children below 6 years old.

Preference and Opinion of the taste, measurement and formulation of the Powder form of drug which is diluted with water

Concerning the powder form of drugs which is diluted with water, parents of children, CDD's, members of the community, traditional authorities and health care workers explained that, these drugs will not be easy for the child to take because of the taste and the presentation of it. Some of them explained the fact, some of these children will take the first spoon and second spoon will not be easily taken and they might end up vomiting the drug. Below is the following presentation of the community member of Tignere Health Area and Health District.

“Powder form of drug which is diluted with water, at times if it is bitter it is not evident”
(member of the community, 47 years old, female, Doualaye Health Area, Tignere Health District, IDI, 13/12/2021)

From the above presentation of the statement made above by the community member, powder form of drugs which are mixt with water, if the drug has a bitter taste it is not evident for the child to take it. Also, the second informants affirm this by making the following statement:

“powder form of drugs which is diluted with water, this is in the form of pap so we can tell the child it is pap they will try to give him the only difficulty is that for the first spoon he will take it, if he knows it is medicine he will refuse the second or he will vomit” (traditional authority, 67 years old, Male, Ebang Health Area, Soa Health District, IDI, 3/09/2021)

According to exchanges held with the traditional authority of Ebang, powder form of drug which is mixt with water is like pap; the child can easily take the first spoon. The difficulty in it will be that, after taking the first spoon, the child will get to discover that it is medicine and he or she will refuse taking the second spoon. And he will obviously vomit the drug out because of the taste and the formulation of the drug. In additional another informant affirms this by making the following statement which will be elaborated below;

“Powder form of drugs, because this drug is dissolves in water, if the quantity of water is voluminous it can happen that the child does not take all the quantity or the normal dose

he or she is supposed to take.” (Health care worker, 29 years old, male, Galim Tignere, Tignere Health District, IDI, 15/12/2021)

Concerning the powder form of drug which is diluted with water, if the quantity of water used to dilute the drug is above the required measurement, the child will not take the normal dose of the drug and consequently the drug might end up being thrown off. Due to the lack of taking the rightful measurement of water, the right dose for this paediatric formulation might not be respected and given to the child correctly because the drug contains much water. Consequently, this paediatric formulation will not be preferred and it will not be accepted by parents because of the taste and its formulation.

On the other hand, due to the lack of lack of good drinking water to dilute powder form of drug with, parents (mothers of children), members of the communities, CDD's and health care givers made mention of this formulation of drug which is not good to give to children below 6 years old. They went further by explaining that, mineral water is needed to be used to dilute the drug with. Based on the data collected from the field, the right measurement of water might not be respected by the parents (mothers). More also, Participants of FGD and informants expressed the fact that, while giving this form of drug to children some of it might throw out or might be wasted. In addition to that, most of these drugs in the form of liquid do not have a long period duration and they usually get expire after 7 days and after these numbers of days have passed these parents cannot give this form of drug to their children. one of the Parents of Baloum health Area, Penka Michel Health District interviewed in the field makes mention of the fact that, parents have to be told not to use water from the river to dilute drug with. Below is the following citation:

“With this, you have to be precise to mothers not take water from the stream to dilute the drug with.” (Parents of children, 56 years old, female, Baloum Health Area, Penka Michel Health District, IDI, 28/01/2022)

On the other, the Health care giver of Bonepoupa Health Area, Yabassi Health District, lays much emphasis on the use of mineral water for the mixture of this form of medication. There is problem of lack of a good source of drinking water in these affected communities. In addition to that, the exact measurement of water to be put in the drug might not be respected and the child might develop infection from the water put in the drug. Below is the following;

“Mineral water is needed to mixt the drug given the fact that we do not have good source of drinking water, the exact measurement of water will not be respected, and the child

might get infection from that water put in the drug.” (Health care worker, 26 years old, female, Bonepoupa Health Area, Yabassi Health District, IDI, 12/10/2021)

Also, another parent of children affirms that, if mineral water is not mixt with the powder form of drug it can create another health complication on the child’s health. Below is the following presentation:

“If mineral water is not used to mixt the medicine, it can lead to another disease.” (Parents of children, 23 years old, female, Yabassi Health Area and District, IDI, 11/10/2021)

From the above presentation, a parent of children explained that if mineral water is not used it can lead to other diseases which might affect the child’s health. Another parent of Gali 2 Health Area, Soa Health District affirms this by making the following statement:

“In the form of Powder, if water is not clean it can disturb the child.” (Parent of children, 27 years old, female, Gali II health Area, Soa Health District, IDI, 8/09/2021)

As made mentioned above by a parent of Gali II health area, Soa health District, drugs in the form of powder, when water is not clean it can disturb the child’s stomach. Based on the information’s obtained from the field, it could be analyzed that, good source of drinking water or mineral water is needed to dilute this form of drug. Or else it can lead to another health complications or diseases on the child.

Preference and Opinions of the taste, formulation and size of Oral dispersible form of tablets

More also, from the findings obtained from parents of children (mothers), CDD’s, traditional authorities, health care givers, members of the community and participants of FGD in Soa, Yabassi, Tignere and Penka Michel Health District, proof that majority of those interviewed in the field preferred oral dispersible tablets for children below 6 years old. This form of drug will be preferred and accepted by parents because of the taste, formulation and flavour. Concerning the taste of the drug, children will suck the tablets thinking it is sweet, if it has a good flavour it will attract so many children to take it. In addition to that, if it will easily dissolve in the mouth in less than 5 seconds parents will prefer this formulation and will accept it. According to exchanges with parents of children (mothers) of FGD of Sole, Bonepoupa,

Yabassi (Banya), Bonadissake and Tonde Health Area, Yabassi Health Districts they preferred oral dispersible tablets for children. Below are the following statement presented by participants of FGD and informants of the Health Areas.

“I prefer the drug which will dissolve in the mouth (oral dispersible) because as soon as the child tries to swallow, one part with the saliva will enter the stomach whatever be the case.” (CDD, 49 years old, male, Galim Tignere Health Area, Tignere Health District, IDI, 13/12/2021)

On the other hand, Community Drug Distributors (CDDs) of Tignere health District affirms that oral dispersible form of treatment will be good for children below 6 years old. Because she believes that a child of 1 month cannot chew tablets but rather, she prefers oral dispersible because as soon as the drug is put into the child’s mouth of the child, it starts dissolving with saliva in the mouth. Also, this drug easily dissolves in the mouth. Below are the following presentations which will be elaborated. Below are 3 presentations of the CDD of Galim Tignere Health Area in Tignere health District.

“Oral dispersible is good, since it is for children of less than 6 years old. I do not think a child of 1 month cannot chew tablets and for that reason I prefer oral dispersible because when you put in the child’s tongue the child can easily take it and it can easily dissolve in the mouth.” (CDD, 46 years old, Female, Tignere Health Area and Health District, IDI, 18/12/2021)

More also, the third informant that is the health care giver of Ballenssing Health Area in Penka Michel Health District prefer oral dispersible form of medication because the child will suck it like sweet because children love what could be sucked. Below is the statement which will be elaborated.

“As for me, I prefer what the child will suck like sweet, children love what can be sucked.” (Health Care worker, 27 years old, female, Ballessing Health Area, Penka Michel Health District, IDI, 22/01/2022)

In addition to that, the fourth informant that is the health care worker of Bonadissake explains that, she prefers oral dispersible tablets for children because it is rapid and dissolves so fast in the mouth. Oral dispersible will be good for children because children below 5 years old could take the drug. Below is the presentation of the health care worker of Bonadissake.

“I will prefer oral dispersible tablets for children because it is rapid and it dissolves in the mouth. Oral dispersible will be good for children because even children below 5 years old could take the drug and it will dissolve rapidly in the mouth.” (Health Care Worker, 40 years old, female, Bonadissake Health Area, Yabassi Health District)

Furthermore, the last statement was presented by a participant of FGD of Bassossia, below she made mention of the fact that oral dispersible tablets are good because the child could be told to suck the tablet like sweet and it is tasteless. Below is the following presentation of the participant of FGD:

“Oral dispersible is good because you can tell the child, suck it like sweet. For it is neither sweet neither bitter.” (Parents (mother) of children, 38 years old, female, participant of FGD, Bassossia Health Area, Penka Michel Health District)

Based on the presentations of the various statements made above, participants of FGD and informants laid much emphasis on the fact that, they preferred oral dispersible form of medication because of the following reasons: children of below 1 month old and above that age group of 0-5 years old can take this formulation easily because it could easily be put into the child’s mouth. Also, the taste of the drug will be highly appreciated by parents if it is not too sweet or if the drug is made tasteless or good children will love it. In addition to that, with the saliva in the mouth, it dissolves rapidly in the mouth without any complication. More also, Parents appreciated the fact that, as soon as the drug is put into the mouth it starts dissolving in less than 5 seconds and by the time the child wants realizes that it is medicine and might want to remove the drug to throw it out, it must have dissolve already. Also, parents made mention of the fact that, before the child tries to spit out the drug or vomit the drug it must have entered into the child’s stomach without the child being conscious. In addition to that, parents expressed the fact that, for the child to suck the oral dispersible form of tablets the child could easily be flattered that, the drug is sweet; it is immediately put into the child’s mouth for it to be sucked like sweet because children love things which could be sucked. In accordance with the participants of FGD and informants, it is very clear that parents will prefer drugs in the form of oral dispersible because of the taste, size and formulation that is: rapidity in dissolving in the mouth of children between 0-5 years old. Based on parents’ opinions they appreciated this form of drug.

Preference and Opinion of the taste, size and formulation of the Chewable form of tablets

Based on the information gathered from the field from parents of children, Health Care Givers and CDD’s, there are some children who do not like chewing tablets because of the taste of the drug. Also, some of the CDD’s and parents of children explained that, some children do

not like chewing tablets either because the drug is tasteless or because the bitter in the mouth. CDD's, health care givers and parents of children explained that, that is one of the greatest challenges faced in the communities while distributing drugs to children. Below is the presentation of the health care worker of Ntonde health area:

“.....some do not chew they say it is bitter and they latter remove it from the mouth.” (Health care worker, 30 years female, Ntonde health Area, Yabassi Health District, 9/10/2021)

As made mention above by the health care worker of Ntonde Health Area, some children do not chew tablets because of they complain of the bitter taste of the drug and they latter remove the drug to throw. On the other hand, a parent of children makes mention of the fact that when the child is asked to chew the tablet, most of the time the child keeps the drug in the mouth and after sometime throws it off. Below is the following statement:

“Chewable tablets: if it is sweet like sweet children will take it, if it does not have any taste the child will not take it because it will be difficult for the child to take it.” (Traditional authority, 53 years old, male, Koulou Health Area, Soa Health District, IDI, 1/09/2021)

From the above presentation of the traditional authority of Koulou Health Area, the taste of chewable tablets matters a lot. He went further by explaining that, if the taste of the chewable tablets is sweet children will take it, but if it does not have any taste, it will be very difficult for children to take it. From the above statement, it can be concluded that concerning the taste of drugs, there are some children who do not like drugs which are chewed because of the taste which is sometime not sweet or it might be tasteless. Following discussion with the traditional authority of Ebang Health Area, Soa Health District, chewable tablets formulations and taste matters a lot for the acceptability of the drug by parents and children. If the drug is sour or it has a funny taste children will have difficulties in chewing and swallowing or else parents will be obliged to grind the tablets and mixt with sugar for it to have a sweet taste. The following statement will be presented below:

“Chewable tablets: if the drug is sour and has a funny taste the child will have difficulty not to easily swallow it. We will only have to force the child or else we mixt the drug with something sweet, just like product put in syrups he will easily chew it, it will pass. And if it is drug which does not have any taste there are some who take products and some are reluctant to take it, for the child to take you need to put some small pressure on the child.” (Traditional authority, 66 years old, male, Ebang Health Area, Soa Health District, IDI, 7/09/2021)

Another aspect which came out so strongly from discussions with parents (mothers of children), traditional authorities, CDD's, members of the communities and participants of FGD (mothers of children) was that of parents having difficulties in giving drugs in the form of tablets to their children to chew. Some parents explained that, this form of tablets which are chewed spoils children's teeth most especially children between the ages of 0-3 years old cannot who are unable chew tablets. Also, parents must be nearer the child to follow up the child to chew the drug and not to throw it out. Tablets could be chew by children of above 6 years old because they are conscious and they know what is good for them. Below are the following statements:

“That is where there are difficulties because some children do not want to chew a tablet that is: the biggest problem. There are other children that when we distribute they take without any problem.” (CDD, 50 years, male, Wogoumdou Health Area, Tignere Health District, IDI, 15/12/2021)

Based on the above information, some children do not want to chew a tablet that is where CDD's face one of the biggest problems while distributing drugs in the community. Below the health care worker of Ntonde affirms this by making the following statement:

“.....some children do not chew, they say it is bitter and they latter remove it from their mouth.” (Health care worker, 30 years female, Ntonde health Area, Yabassi Health District, 9/10/2021)

As made mention above by the health care worker of Ntonde Health Area, some children do not chew drugs because of they complain of the bitter taste of the drug and they latter remove to throw. On the other hand, a parent of children makes mention of the fact that when the child is asked to chew the tablet, most of the time the child keeps the drug in the mouth and after sometime throws it off. Below is the following statement:

“That one if you ask the child to chew it, the child can keep the medicine in the mouth and refuses to chew the drug and after some time throws the drug.” (Parent of children, 23 years old, female, Bamendou Health Area, Penka Michel Health Area, IDI, 25/01/2022)

More also the chief of Bassossia Health area makes mention of the fact that a child with teeth can chew the drug but a child who does not have tooth cannot chew the drug. Below is the presentation of the chief:

“A child with teeth can chew the drug, but if he does not have teeth he cannot chew it. But with saliva it can dissolve in the mouth.” (Traditional authority, 82 years old, male, Bassossia health Area, Penka Michel Health District, IDI, 18/01/2022)

After interviewing a parent in Baloum community, he also affirms that children below the age of 4 years old cannot chew tablets. They cannot chew because they do not understand. Below is the presentation of a parent (mother of children) of Baloum Health Area.

“If the child is below 4 years old and the child hears he has to chew the drug. The child will understand chew the drug but the child cannot chew the drug. A child of 2 years old cannot chew like a child of 4 years old. So do you feel a child can take this drug even when you speak with the child will he understand?” (Parents of children, 56 years old, Female, Baloum Health Area, Penka Michel Health District, IDI, 28/01/2022)

After discussing with participants of FGD and informants in the field, in the general sense it can be concluded that drugs given to chew to children below 6 years old it is really difficult. These age groups of children do not find it easy to chew drugs in the form of tablets most especially if the drug is not sweet or tasteless; most of the time parents find these children throwing the drug. Based on the opinions of parents of children, traditional authorities, CDD's, members of the communities, health care givers and participants of FGD of the 4 health Districts, they will not be in according in the preference of this form of drug because of the taste and presentation for children between 0-5 years old. It can also be concluded that, parents do not give any importance to the colour of drugs for their preference.

Preference and Opinion of the taste, size, and formulation of Tablets form (large)

From the findings obtained from informants (parents of children, health care givers, CDD's, traditional authorities and members of the communities) and participants of FGD (mothers of children) the taste, size and formulation of this form of drugs will influence the preference and acceptability of drug by parents for children below the age of 6 years old. Concerning the taste of this form of drug, parents of children (mothers), health care givers traditional authorities, members of the communities, CDD's and participants of FGD explained that, children generally do not like any form of medication which is taken with water because they have that all drugs taken with water have a bitter taste. Also, if this form of drug which is taken with water is bitter or not bitter children of this particular age group 0-5 years old will obviously vomit it out because of the size and because they are not used to drinking this form of tablets. Due to the size of the tablets, parents are forced to grind it and dilute with water before giving the child. Some parents explained that, in the course of grinding this form of drug, it might lose its value or some elements might get missing. With respect to this form of drug which is taken with water, the taste matters, formulation and size matters a lot most especially for children of 0-5 years old. Concerning the size, the taste and formulation of this form of drug,

below is the following statement of the CDD of Doualaye Health Area, Yabassi Health District.

“Tablets to be swallowed with water, I think that on 100 children I think about 50 children will refuse, they will see water and tablets they will say to themselves it is something that is and then that is when they will have to be forced to do something. In this case, it is very difficult, when there is water, as for me I say it is difficult...the difficulty in it, is the size of the tablet and the fact of giving the child this drug with water it means it is bitter. Even if the drug is not bitter, I do not think the child will swallow it with water.” (CDD, 30 years old, male, Doualaye Health Area, Yabassi Health District, IDI, 10/12/2021)

From above statements of the CDD of Doualaye Health Area, Yabassi Health District it can be summarized that, tablets which are taken with water it is very difficult for children to drink it. This CDD goes further by illustrating the fact that, out of 100 children about 50 will refuse to drink the drug. Whenever children see tablets which are taken with water they have that conception that the taste of the drug is bitter and the size of the drugs makes it very difficult for them to swallow it. Also, children of this age group cannot swallow the tablet with water. On the other hand, if the drug is not bitter children will not still drink because of the size and taste of the drug. The second participant of FGD makes mention about the taste of the tablets which will be elaborated below.

“Tablets to be swallowed with water, all depend on the taste.” (Participant of FGD (mother of children), 18 years old, female, Bassosia Health Area, Penka Michel, FGD, 18/01/2022)

Based on the above presentation of a participant of FGD (mother of children), for children to drink this form of tablets with water it will depend on the taste of the drug for the child to swallow. More also, the next participant of FGD of Bassosia Health Area talks about the taste of tablets which will be presented below:

“Children know all tablets are bitter.” (Participant of FGD (mothers of children), 30 years old, Female, Bassosia Health Area, Penka Michel, FGD, 18/01/2022)

From the discussion we had with one of the participants of FGD (mother of children), it is very clear that children already have that notion that all drugs in the form of tablets have a bitter taste. Tastes of tablets have a lot of meaning to children and generally children fear taking tablets because they already have that notion that tablets are bitter. Below is the presentation of a community member of Galim Tignere Health Area.

“So generally, when children swallow tablets, it does not descend, the child vomits the tablets and it comes out. Most especially tablets which are big in size, it is very

complicated. Most of the time we grind the tablets so as to reduce the size and so that it can easily go down the child's throat." (Member of the community, 39 years old, male, Galim Tignere health Area, Tignere Health District, 12/12/2021)

According to the statement made above by the community member of Galim Tignere Health Area, the size of this form of tablet really makes it very difficult for children to swallow. It is believed that when this form of drug which is very big in size is given to the child to drink with water, it cannot go down the child's throat and the child is forced to vomit out the tablet. This formulation and size of the drug is very complicated for children and for that reason parents are forced to grind the tablet which is diluted with water so as to reduce the size of the medication which is easily given to the child. When this form of tablet is ground and given to the child it will easily descend the child's throat as said by informants and participants of FGD. A summary of the presentation of the member of the community of Bonadissake will be done below:

"Children have difficult to swallow, the drug is too big and the throat of the child is small; even we adults fear big tablets, you swallow but you are afraid, children cannot swallow it like that because it is big. Such drugs we grind it and the child drinks it." (Members of the community, 60 years old, male, Bonadissake Health Area, Yabassi Health District, 8/10/2021)

As made mentioned above by the CDD of Bonadissake, it is really very difficult for children to swallow this form of tablets with water because it is too big in terms of size which cannot go right down into the child's throat. Based on his points of view the child's throat is too small for this size and form of tablets to descend. Due to the size of the tablet, this form of drug is ground and then given to the child to drink. More also, the next informant agrees on this idea by making the following statement which will be much more explicit below.

It is really big, very delicate for the child. It will give gastric to the child. There are things the child cannot take, children in a long run it can cause a problem to the child's health which people might not know it was caused by that drug. The child will have difficult to swallow that drug because it is too big. (Traditional authority, 51 years old, male, Sole Health Area, Yabassi Health District, IDI, 5/10/2021)

Following the in-depth interviews carried out with the traditional authority of Sole Health Area, there are drugs which children cannot take because children are very delicate human beings. This form of drug is big for the child, secondly the child cannot swallow it and in a long run it can affect the child's health which people might not know it was caused by that particular drug. Consequently, this form of tablets can lead to gastritis on the child. Absolutely, the CDD

of Sole lays much emphasis on the size of this form of drug which is given to children 0-6 years old, the following statement will be elaborated below.

“The drug is too big and the throat of the child is not well developed it can get stuck in the throat, it can cause gastric to the child. Such drugs should be ground. (CDD, 30 years old, male, Sole health Area, Yabassi Health District, IDI, 5/10/2021)

Based on the information's obtained from informants and participants of FGD, the largeness in size of this form of tablets, cannot be swallowed by children below the age of 6 years old in the various communities. Secondly, this formulation is not generally good for children between the age of 0-5 years old because of its form and size. In addition to that, parents went further by explaining the fact that, children of 0-5 years old their throats are too small and it is not yet well developed for them to swallow this form of large tablets. Due to the largeness of this drug, it cannot go down children's throat. Most of the time when children are forced to take this form of drug, they end up vomiting it and the drug might get stock in the throat of the child. Also, this form of drug might cause gastritis on children which is one of the reasons this drug will not be accepted and not preferred by parents of children. Based on the opinions of informants and participants of FGD, it is believed that children between 0 to 5 years old are very tender and they are not used to swallowing this form of medications. More also, Parents of children made mentioned of the fact that, due to the size, taste and formulation of this form of drug, they are obliged to grind these tablets, diluted it with water and sometimes sugar is added to it so as to improve on the taste and to easily give to the child to swallow at once without any complications. Another inconvenience with this form of drug, it is that of the taste of the drug which is usually modified by parents. Most especially if the drug has a bitter taste. Also, parents make mention of the fact that by modifying this form of drug that is by grinding, diluting with water and adding sugar to it: some elements are lost in it and not all is given to the children. It can be concluded that, based on parents of children opinions, they will not prefer this form of medication because of the size, taste and presentation of it. From observation and discussions with informants and participants of FGD, Parents are not interested in the colour of drugs for their preference.

Preference and Opinion of the taste, size and formulation of Mini tablets

According to exchanges we had with parents of children, traditional authorities, CDD's, Health Care givers, members of the communities and participants of FGD, they each gave their

opinion of the preference of drug for children between the ages of 0-5 years old. This was based on the taste, size and formulation of the drug. They made mention of the size of the drug which is good as it is small in size and it will be good for children above 5 years old to 7 years old because they are well develop and they are very conscious of swallowing the drug with water. Concerning the taste of the drug it has a great role to play on the acceptability and preference of the drug by parents and children, it will really be a big difficulty for children of 0-5 years old if is bitter, children will drink it and vomit it. Concerning the formulation of the drug for children between the ages of 0-5 years old they cannot drink drugs in the form of tablets no matter the size most especially children between 0 months -3 years old. it is because they do not know how to swallow tablets, they are used to drinking drugs in the form of syrups and drugs in the form of tablets which are ground and mixt with water for them to easily swallow. Also, these children are still very tender to swallow tablets. Below are the presentations of opinions of informants and participants of FGD interviewed in the field.

“Mini tablets, all this depends on the age of the child if the child knows it is bitter he will not take it.” (Parents of children, 26 years old, female, Bonadissake Health Area, Yabassi Health Districts, IDI, 8/10/2021)

From the opinion of a parent of children, Bonadissake Health Area, for a child to take drugs in the form of mini tablets it will depend on the age and the taste of the drug. Meaning if the child knows this mini tablet is bitter, he/she will refuse taking the drug. The colour of the drug does not have much meaning to them. The next informant lays much emphasis on the taste and formulation of the drug. She affirms this by making the following statement which will be presented below.

“It depends on the age of the child if the child knows the drug has a bitter taste he will not take, whereas when it is in the liquid form the child will say it is juice.” (Parents of children, 37 years old, female, Doualayer Health Area, Tignere Health District, IDI,

According to the opinion of a parent of Doualayer Health Area, for children to take this form of drug it will be depend on their ages. Secondly, when children know the drug has a bitter taste they will refuse to take it. So, the form of the drug to be given to children below 6 years old matters a lot because when drugs are in the liquid form children will take it without any complications. In addition to that, another informant lays much emphasis on the formulation and the size of the drug which will be elaborated below.

“Children generally do not like tablets they will vomit it out.” (Health care giver, 42 years old, male, Koulou Health Area, Soa Health Districts, IDI, 01/09/2021)

According to the expressions of the health care giver of Koulou Health Area, in the general sense children do not like drugs in the form of tablets. Most of the time, when given this form of medication they vomit it out either because of its form or taste. Also, the CDD of Bansoa Health District affirms that, this form of tablets will not be preferred for children. Below is the following statement:

“It could be, but for adults who are older children of above 10 years old could take it but children of a certain age group will refuse taking it.” (CDD, 63 years old, male, Bansoa Health Area, Penka Michel Health District, IDI, 19/01/2022)

Based on the above opinion of the CDD of Bansoa Health Area, mini form of tablets which is taken with water will be good for older children of 10 years old and above. Also, children of a particular age group will not accept to take this form of medication because of its form. Below is the presentation of the health care worker of Balenssing Health Area, affirming that children below 5 years old cannot swallow.

“The child cannot swallow because the tablet is small.” (Health care giver, 21 years old, Female, Balenssing health Area, Penka Michel Health District, IDI, 23/01/2022)

Based on above presentations and other data which collected from informants and participants of FGD in the various health Districts children of 0-5 years cannot swallow this form of tablets no matter its small size of the tablets and its formulation. From discussions held with informants and participants of FGD of the various health areas, it was realized that parents were not interested on the colour of the drug for it to be accepted in the community. Also, It was discovered that what parents are really interested in the form of mini tablets are: the taste, the size and the formulation. It could be concluded that, parents will not accept and will not prefer this form of tablets because children do not like tablets, the bitter taste of the tablets will repel them from swallowing the drug and when children see it is tablet, they will refuse swallowing it. Also, mini tablets which are swallowed with water will not be good for children of 0-5 years old; this form of tablets will rather be good for older children of 10 years and above.

Difficulties encountered in the storage of drugs and mass campaign of drug administration on children in the communities

i) Refusal to take drugs during mass campaign

In-depths interviews were carried out with, CDDs and health care givers of Soa and Yabassi Health District. According to them, one of the greatest difficulties faced during mass drug distribution in the community, it is that of refusal to take drugs like Mectizan and other forms of drugs, be it for adults or children. Below is the summary of the statement of the health care giver of Sole Health Area, Yabassi Health District.

“.....In some homes they will chase you away, some will say they have taken alcohol come the next day.....” (Health Care giver, 52 years old, female, Sole Health Area, Yabassi Health District, IDI, 6/10/2021)

From discussion with the health care giver of Sole, some of the members of the community refuse taking Mectizan because it will prevent them from drinking alcohol for days and in some homes they will chase the CDDs away from their home. On the other hand a parent made mention of refusal to take drugs during mass drug distribution in the community. Below is a summary of her presentation:

“There are some people who came here to give drugs to children we usually drive them, there is a lot of free drugs which is not good, Some people come to my house without informing me, the world now is so wicked we do not know who is who.”(Parent of 8 children, 37 years old, female, Bonepoupa, Health Area, Yabassi Health District, IDI, 13/10/2021)

This parent interviewed makes mention of the fact that, when community drug distribution come around their homes for drug distribution, they refuse to take drug by driving them away. She goes further by explaining that, they are not informed of their visit right ahead of time and that their reason for refusal it is because the world is so wicked consequently, they do not know who to trust. In conclusion, there is problem of refusal to take drugs which is one of the greatest difficulties encountered by CDDs in the community and health care givers

ii) Impact of Covid 19 pandemic in the communities

Another aspect which came out so strongly from discussion with members of the communities, parents, community drug distributor and health care givers in Soa and Yabassi Health District was that of the impact of covid 19 pandemic and vaccination campaign. It has had negative effects in taking of drugs like Mectizan, vitamin E for children and other forms of drugs distributed during mass campaigns in the community. Most parents refuse to take

drugs for their children for fear that the drug will kill children and that they are not very sure of the drugs coming from the European countries.

“With the covid 19 pandemic there are so many bad drugs outside there which whites want to use, to kill blacks, so it makes us so skeptical of the drugs distributed in the quarter. To be sure of the drug, I prefer to take from the hospital.” (Parents of children, 37 years old, female, Bonepoupa, Health Area, Yabassi Health District, IDI, 13/10/2021)

From the above presentation, one of the difficulty parents faced is that of the fear of Covid 19 pandemic and vaccination, it is believed that there are so many fake drugs out there which are given by the whites to kill blacks. For that reason, it makes some parents to be skeptical of the free drugs distributed in the community. The health care worker of Galim Tignere Health Area affirms that Covid 19 has affected the distribution of drugs in the community. Below is the following presentation:

Given the present context, for example covid 19, of recent there was distribution of drugs to deparasitant so there were people who wanted to hide their children. And so they told themselves children have to be vaccinated against covid 19. So we needed to pass from door to door reassuring them that is not what you think. (CDD, 49 years, male, Galim Tignere Health Area and Tignere Health District, IDI, 18/12/2021)

The health care worker of Ballenssing Health Area affirms that Covid 19 has affected the distribution of drugs in the community.

“Covid 19 has equally affected the distribution of drugs in the community.” (Health Care worker, 23 years old, female, Ballenssing Health Area, Penka Michel Health District, IDI, 22/01/2022)

Below, the third informant affirms that the only difficulty faced is that of Covid 19 pandemic. It is because there were a lot of rumors about the effects of the disease. The following presentations were enumerated below:

“The only difficulty was covid 19 vaccine people said a lot of things some said it has com kill.” (Traditional authority, 59 years old, female, Bonadissake Health Area, Yabassi Health District)

Below is the presentation of the community leader of Gali 2, presenting the effects of covid 19 pandemic.

“There are difficulties now because parents do not want to vaccinate their children because much is talk about corona vaccines which people say you people came to kill our children and that the whites want to kill their children. So many children have difficulties so now it depends on homes, a parents can say for the good of my child he can do it. Some say even they treat or not they will not accept it. Because the vaccination for polio passed

around it was not at all easy for parents to accept vaccinating their children.” (Traditional authority, 62 years old, male, Gali II health Area, IDI, 8/9/2021)

Also, with the covid 19 pandemic and the rumors on social Medias it has made so many people scared. Some informants said, drugs brought to Africa are to cause infertility on children and to eliminate children. Some informant interviewed expressed the fact; they prefer to take drugs from the hospital than taking it during mass drug distribution. It can be concluded that, covid 19 pandemic and covid 19 vaccination programs has had a negative effect in mass drug distribution in the communities or villages.

iii) Consequences of the secondary effects of Mectizan, praziquantel, Mebendazole and Abendazole on children in the community.

Also, from the interviews carried out with the community members, care givers, some parents and participants of FGD of Soa and Yabassi Health District, one of the difficulties faced in the community was that of the influence of the secondary effects of Mectizan on individuals. This has contributed in making so many people to fear and to deliberately refusing to take Mectizan. Some people had very bad experiences with Mectizan and consequently, it has made so many members of the community to fear taking Mectizan. Below is the following presentation of the traditional authority of Koulou Health Area, Soa Health District.

“Many children will not accept taking drugs because of the secondary effects which it has caused in the community.” (Community member, 53 years old, male, Koulou Health Area, Soa Health District, IDI, 1/9/2021)

From the above statement, a member of the community of Koulou explained that, so many children will not take Mectizan because of the secondary effects it has caused in the community. Below is the following presentation of a statement made by the traditional authority of

“..... mectizan gave secondary effects on children by leading to other diseases. There is the case of a mad man which was caused by mectizan.” (Traditional authority, 66 years old, male, Koulou, Health Area, Soa Health District, IDI, 1/9/2021)

From the above presentation of the community leader, Mectizan has had bad effects on children consequently leading to other diseases. For example, there is the case of a man who got mad as result of taking Mectizan. Also, there is the case of children who suffered from other diseases after taking Mectizan. In conclusion, the secondary effect of Mectizan on

children has made it so difficult for children to accept taking drugs during mass drug distribution campaigns in the villages.

iv) **Absence of families in their homes during days of campaigns**

While discussing with health care givers, community members and CDDs, one of the greatest difficulties faced by community drug distributor, it is that of the absence of families in their homes. Most of the time when distributions are been carried out, some families are in their farms and they mostly return late in the evening. Another difficulties, it is that of not meeting some members of the family at home during mass drug distribution in the community.

“We are in the rural (community) village, most people are farmers and our time table does not match with that of parents who are farmers and that of community drug distributors. Some go to the farm in the morning and come back in the evening and when you go to those homes they will tell you they are tired, or they are just coming back from the farm. They will throw slants they are just are coming back, they want to cook or they want to eat.” (Health Care giver, 50 years old, female, Sole Sole Health Area, Yabassi Health District, IDI, 6/10/2021)

From the above statement, since they are living in villages (rural areas) majority of the population are farmers. The time table for the community drug distributor, health care givers does not match with that of parents who are farmers. Some parents go to the farm in the mornings and they return in the evening and most of the time when they go the homes in the evenings, they give excuses of juts coming back from the farm and that they are tired. They sometimes throw slants: they are eating or cooking. It can be concluded that, the absence of families or parents makes during distribution of drugs makes it difficult for them to take drugs even after they are back from the farm. Another informant makes mention of the fact that most of the time people are not met home. Those who are not met home will have to pass in the health center to collect their own medications. Below is the following presentation:

“Most of the time people are not met at home. In case of absence, they have to pass in the health center to collect their own drugs.” (CDD, 73 years old, male, Bassossia,

The next informant makes mention of the fact that, he has never been met home during periods of drug distribution of Mectizan in the community. Below is the presentation of the Community member:

“For me, with respect to the distribution of the Product, they have never met me at home.” (Member of the community, 62 years old, male, Baloum health area, Penka Michel Health District, IDI, 28/01/2022)

From the above presentations and discussions with informants and participants of FGD in the various Health Districts of Soa, Yabassi, Tignere and Penkam Michel, it is very clear that, one of the difficulties faced in these rural communities it is the absence of members of the communities at home. Most of the time, the time table of the days of distribution of drugs does not coincide with days of farmers are home because most people living in these rural areas are farmers and some have not aware of the days.

v) Non respect of parental consent during mass drug distribution in the communities

From the Findings obtained from parents of Yabassi, Soa, Tignere and Penka Michel Health it is very clear that, one of the greatest difficulties faced by parents it is that of the lack of respect parental consent by CDD's and community health agents. Parents complained of the fact that, while in their absence at home drugs are given to children in the community without the consent of the parents. Also, while discussing with some parents in the field, they complained that, there are some drugs which are given to children in the primary schools without them being aware of it. These drugs are given to children by teachers without any parental consent or notes sent to parents the eve before distribution. They went further by saying; some of these same drugs are given to children twice, that is: at home by parents and in school by teachers without the parent being aware of it. Consequently, they do not know if this drug might lead to complications in the nearest future. Below is the presentation of a parent of Bonadissake Health Area, Yabassi Health District:

“People give drugs to children when the mother of the house is not around and creates another problem.” (Parent of children, 26 years old, female, Bonadisake Health Area, Yabassi Health District, IDI, 7/10/2021)

One of the Parents interviewed in the field complained of the fact that, one of the difficulties faced in the community, it is that of non- respect parental consent. At times these CDDs pass in their home during their absence; it is later on they get to discover that drugs were given to their children during their absence and it was done without their consent. At times these drugs given to children might create another problem. However, the second informant makes mention of the fact that: parental consent is not respected by CDD's. And so forth, most of the times when they are not home, drugs are given to their children in their absence. It is only when they come back home that, they are informed. Below is the following citation of a parent of Ntuisong Health Area, Soa Health District.

“Like now, some parents do not have time and some are not at home just for you to find out some people came around and what was given to their children in their absence.....”
(Parent of children, 32 years old, female, Ntuisong Health Area, Soa Health District, IDI, 30/08/2021)

Concerning the idea of parental consent, another member of the community of Gali II Health Area, Soa Health District make mention of the fact that, drugs should be given to the child’s family than in schools, because CDD’s are respecting parental consent. Most of the time drugs which are given to children in schools, children have not eaten because parents have not been informed. Below is following citations:

They should better pass through the family than passing through schools. Because it is good children first of all eat at home before taking drugs. Those who do not want to take should stay home and those who want the drugs should go to the hospital. We do not have any problem but it is those of the community drug distributors who are not adhering”
(member of the community, 39 years old, female, Gali II health area, Soa Health District IDI, 8/09/2021)

Based on the data obtained from the field, it is very clear that, parental consent is one of the greatest difficulties experienced by parents. Some parents interviewed in the field complained of the fact that, some drugs are given to their children by CDD’s in their absence. Also, drugs are given in schools without the consent of parents.

vi) Unawareness of the days of campaigns in the community

On the other hand, parents and members of the community of Soa, Yabassi, Tignere and Penka Michel Health District express their difficulties encountered during mass drug distribution which is: lack of awareness of the days of campaigns put in place for mass drug distribution in the community. Members of the communities complained of the fact that, they are not sensitized and told right ahead of time. Below is the following presentation of a parent of Bonadissake Health Area, Yabassi Health District.

“People are not told right ahead of time about drug distribution.” (Parent of children, 26 years old, female, Bonadisake Health Area, Yabassi Health District, IDI, 7/10/2021)

From the above brief explanation, it is very clear that members of the community are not told right ahead of time of the days set aside for mass drug distribution in homes. This is in order to permit them stay home waiting for their drugs. It can be concluded, lack of awareness of the days of mass drug distribution in the community, it is one of the major difficulties encountered by parents.

vii) Members of the communities giving of fake appointments to CDD's and Health care workers

From the Interviews carried out with the CDDs and health care givers, one of the greatest difficulties faced it is that, of fake appointments which are given to CDDs in the community. Below is the following statement presented by the community drug distributor of Bonadissake Health Area, Yabassi Health District.

“Sometime you go in the morning in certain homes the mother of the house will tell you came early I am going to the farm, come back at 7 pm..... that is the more reason if I come to your house and you reprogrammed me I will no longer come, since you do not want to take it if you like do not come to take it at my house I will give it back to the hospital and I care less about you. I cannot work on your pace.” (Community Drug Distributor, 33 years old, male,

The Community Drug Distributors (CDDs) expressed the fact that, so many people give fake appointments and that at times when they go for drug distributions in some homes in the mornings, at times they will complain of the fact that you came so early. Consequently, they will reprogram the Community Drug Distributor for the evening. In conclusion, CDDs encounter difficulties like fake appointments.

viii) Lack of interest in Free drugs distributed in the community

From discussion with parents, traditional authorities, members of the communities, health Care givers, and participants of FGD of Yabassi, Tignere, Penka Michel and Soa health district, some of these parents do not believe in free drugs which are administered on children during mass campaign in the community. They explained that, they are not interested taking free drugs which are distributed in the community during mass campaign. Either, because of their traditions or beliefs or other factors, below is the presentation of a parent of Bonepoupa.

“With the covid 19 pandemic there are so many bad drugs outside there which whites want to use it to kill blacks, so it makes us so skeptical of the drugs distributed in the quarter that is free drugs. To be sure of the drug, I prefer to take from the hospital.” (Parent of children, 37 years old, female, Bonepoupa Health Area, Yabassi Health District, IDI, 12/10/2021)

The informants explained that, With the covid 19 pandemic parents are afraid to take free drugs which are usually distributed during mass campaigns in the community because they believe that so many of these drugs which are distributed are not good and they have a lot of doubts about these drugs. Below is a brief statement of the CDD of Bamendou:

“.....right up till now, in the community there are some parents who still refused drugs. They say that we should not give these drugs which are free of charge to their children, they say free things are not good..... Some parents do not like it. They say njore things are not good.” (CDD, 52 years old, male, Bamendou Health Area, Penka Michel Health District, IDI, 24/01/2022)

More also, the third informants that is a parents of Baloum Health Area, Penka Michel Health District also, lays much emphasis on parents refusal to take free drugs in the community. Below is the following presentation:

“It is like vaccinations, of recent, when we were told we had to vaccinate our children and they have to take vitamin E. other people said, this drugs is to render children sterile.” (Parent of children, 56 years old, female, Baloum Health Area, Penka Michel Health District, IDI, 24/01/2022)

In conclusion, some health care workers, parents, CDD's and traditional authorities interviewed expressed the fact that, the taking of free medication by some parents in the community, it is really is big problem or challenged faced by some of them. Some of those who are pro against the taking of medication are always ready to draw others to their camp so that will not take the drug. They always try to convince other ignorant and illiterate not to accept to take the drugs by giving the following reasons to them: the drugs are free of charge; the whites have come to reduce the black race and the drugs are to make children sterile. They are always trying to criticize every free drug which is brought into the community for children to take. Some of them expressed the fact that they prefer to take drugs from the hospital than taking in the quarter because there are so many drugs which have been produced to kill blacks. In conclusion, some parents do not believe in taking free drugs.

ix) Non accessibility of homes in the absence of the husband

From observation and discussions with CDDs, parents, health care givers and community leader's accessibility in the Muslim community in most home, it is really a big problem. Informants expressed the fact accessing Muslim homes in Tignere Health District in the absence of the husband of the house; it is really a big Taboo in the Muslim religion and in their culture. Also, they made mention of the fact that, it is stipulated in the Muslim Koran that, the woman does not have the right to receive any man or visitors at home in the absence of the husband and without the consent of the husband or the husbands brothers. So, most of the time in the community, before mass drug distributions are carried out in the community, the husband of the house has to be informed few days before the distribution of the drugs or else, if the husband is not around the brother of the man has to be informed of the day, time,

month of distribution. If he gives his consent well or if he says he cannot unless the husbands of the women are around, he can come around later, it becomes another challenge. Or else if none of them is around, the CDD cannot go for distribution in those homes.

More also, based on observations and discussions with informants and participants of FGD due to some cultural beliefs in the grass field that is: in Penka Michel Health District, homes of notables, the palace (the chiefdom) and some homes could not be accessed without the consent of the husband or the father of the house if he was not around and had not given his consent. Most of the time CDDs have to inform the chief about the date, the time and month of the distribution before distributing the drugs to the members of the community. Consequently, the impact of religion beliefs and cultural practices really makes it a big challenge in some communities. Below are the following statements of the CDD of Wogoumdou Health Area in Yabassi Health District:

“Just like the chief said, there are some people who do not accept that we should see their wives. It comes from jealousy, he does not want people in his absence; there is the religious aspect, Islam says that women should not receive men in the absence of the husband. Most of the time women answer from a distance, she will say no! He is not there, and you automatically you know, you just have to stop when you do not want any problem. When she says so, she will not come out, so she will not accept, it is only when the man will be around. That is where there is a problem.” (CDD, 50 years, male, Wogoumdou health Area, Tignere Health Area, IDI, 15/12/2021)

As made mention above, the CDD explained that, because of religious reasons there some men in the community who do not accept that their wives should be seen while in their absence. On the other hand, the community leader Wogoumdou Health Areas also affirms that the Muslim religions affects the distribution of drugs in the community. He goes further by making the following statement:

“What is there is that, some of the time the father of the house does not like people to enter into their compound. Even the doctor and the CDD’s know the places they do not have to enter. You cannot enter in some homes without the consent of the husband.” (Traditional authority, 53 years old, male Wogoumdou health Area, Tignere Health Area, IDI, 15/12/2021)

Therefore, issues of cultural values like religion and cultural believe systems are aspects which play a great role in the acceptability of moxidectine in the community. Accessibility in most Muslim homes (Tignere health District) and grass field communities (Penka Michel), it is really a very challenging situations for community leaders, CDDs and health care workers in that zone. It makes it to be one of the greatest hindrances for acceptability of drugs in

cases where there is the absence of the husband. Unless the husband of the house is around that is when the wives can accept to give this drug to their children. Or else, if the man is not around it is practically impossible to access some of these homes for community mass drug distributions. Also, cultural factors like the absence of notables, the chief of the village, the husband of the house, the quarter head, the Njaro and Lamido are other factors which affect the giving of drugs in homes. Furthermore, it is only when the CDDs, have received approval from the heads of the family or the chief they can then go ahead with the distribution.

Discussion

Despite the high burden of NTDs in paediatric population, there are few drugs available for the treatment of this population. In order to develop a paediatric form of moxidectin (a drug with a stronger and longer effect on onchocerciasis than ivermectin) it appears relevant to identify the best formulation which will insure more adherence of the target population. This mixed qualitative and quantitative study aimed to assess opinion and preferences of children, parents, caregivers and other community members about oral medicines formulation for children.

We found that tablets and syrups were the most common formulations in the population. This can be explained by the fact that study area is endemic to malaria and other infectious diseases, and most antimalarial and antibiotics are either in syrups or tablets. Moreover, concerning the two possible formulations of moxidectin -namely chewable and orodispersible, the swallowability, the texture, the ease and willingness to take the drug was globally similar for both formulations. However, orodispersible form was preferred by most participants interviewed as it presents some advantages including the possibility to be given to children who can chew and the speed of dissolution of the drug in the mouth which reduced the chances of rejection by the child. Ranmal et al. found a different results, with more children preferring chewable as compare to orodispersible [8]. The difference can be explained by the age of participants as they included children from 6 to 17 years, while our population was less than 12 years. Furthermore, our results show that the age above 06 years seems critical for the ability to take tablets or to chew as some informants stated that children above 06 years old may take chewable tablets while those below 06 years may not

be able. The limit of 06 years was also cited in other papers as the age from which tablets and capsule can be considered suitable [12]. This suggests that the age of target population may be determinant in the choice of drug formulation. For paediatric moxidectin, orodispersible form may be the best one, as it can be administered even to children less than 06 years who are also affected by onchocerciasis with prevalence going up to 12 % in some areas [13]. Nevertheless, a trial comparing the perception and acceptability of the different formulations may provide more specific and accurate data on the best formulation.

The sweet taste of the drug was also reported as a key determinant of acceptability of the drug by children, especially for tablets (including chewable and orodispersible). Indeed, Mannella et al. reported “bad” taste of paediatric drugs as the main reasons of drug rejection by children [14]. This was also reported in our results, as some parents explained that the use to force children to take drug when the taste was bitter while children easily accepted drugs with a sweet taste. Although sweetness of paediatric drugs may increase risk of drug poisoning, the bitter taste should be avoided while developing drugs for children in order to increase adherence. This risk of poisoning is especially reduced for drug used for mass treatment as they are stored in health facilities (and not at home as some other drugs) where children have less access. More studies may help to clarify the real impact of taste on treatment adherence (especially for mass drug administration), and to give a better estimation of the risk of poisoning for sweet drugs.

Apart from the characteristics of drugs, other factors were reported as determinants of adherence and success of mass treatment. This included the period when the treatment is planned as some parents are usually absent in their homes during the days of campaigns. Moreover, the awareness of the days of campaigns in the community is also crucial for the success of the campaign. Indeed, A community mixed survey reported that being absent during mass drug administration campaign was the key factor impacting noncompliance, reported by a third of those who did not receive the drug during the last campaign [15]. Although this absence mostly concerns adults, it also affects the treatment of children as the agreement of parents must be obtained in order to treat children. The absent of parental consent during mass drug distribution for children was even reported as a complaint from parents and other community members, and represent a threat for the community adherence to campaign. In some cultural setting, even the access to the compound or the household is not allowed in the absence of the father. These results emphasize on the need to involve the

community members in the planning and the delivery of mass drug administration for children, in order to address most challenges which may present.

Some limitations can be mentioned for this study. Perception and preference were assessed without giving any drug to the child, and this could introduce a bias in their answers, especially for those who didn't take the formulation recently. We address this by showing pictures of different formulation, with simple explanation provided on how the formulation is taken. Parents were also answering from the experience they have with other drugs they gave to their children. Furthermore, the tool used to assess perception was designed and validated for the assessment based on pictures without drug administration. Another limitation is that some participants had never faced some formulations which were evaluated (especially orodispersible and minitablets) as there are not common in our context. Their answers were mostly based on the explanation given by data collector. It should be acknowledged that the main strength of this study is that it was conducted in rural endemic area for NTDs with various cultural environment included. The target population (children) as well as those who are in charge of administrating the drug (parents and caregivers) were involved in the study.

Conclusion

Syrups and tablets are the mostly used formulation for children in rural area where NTDs are highly prevalent. Chewable and orodispersible formulations (the two possible for moxidectin) are not commonly used in those area. The global assessment of swallowability, texture, the ease and willingness to take the drug was similar for these two formulations. Orodispersible formulation was preferred by participants as it has some advantages, including the possibility and easiness to administer to children under 06 years. The taste of the drug was also reported as a key determinant of children adherence to treatment, bitter drugs being mostly rejected while sweet ones are mostly accepted. However, caution must be exercise concerning the risk of drug poisoning for sweet drugs. Apart from drug's characteristics, community mobilisation and involvement in campaigns planning may contribute to address some challenges related to mass drug administration, as well as some wrong information on potential adverse events of tablets. As this study was only based on questionnaire and pictures of drugs, a trial with administration of different formulations may provide more details on acceptability and adherence to various paediatric formulations.

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Appendices

Appendix 1. Data collection form

Date: ___ / ___ / ___ dd/mm/yyyy Participant code: ___ ___ ___

 Health district: 1 Tignere 2 Soa 3 Yabassi 4 Penka-Michel

Health area: _____

SECTION 1: Description of the participant

N	Questions	Answers
S1Q1	Category of participant 1=Parent 2=CDD 3=Care giver 4=Children 5=Other community member 6=Other (Specify)	
S1Q2	Age Years
S1Q3	Gender 1 = Male 2 = Female	
S1Q4	Level of education: 1. No formal education 2. Primary 3. Secondary 4. Tertiary	
S1Q5	Region of origin: 1. Centre 2. Littoral 3. West 4. Nord-West 5. South-West 6. East 7. South 8. Adamawa 9. North 10. Far-North	

SECTION 2: History of drugs formulations administration / consumption

S2Q1	(for parents, CDD, caregivers, other) Have you ever administered drug orally to a child below 06 years of age? 1. Yes 2. No	
S2Q2	When was the last time you received / administered it? Weeks
S2Q3	a. Syrups	
	b. Tablets	

What are the formulations you have received / administered? 1. Yes 2. No	c. Oral dispersible forms	
	d. Powder for solution	
	e. Chewable	
	f. Mini tablets	
	g. Other (specify)	

Section 3: Opinions from experience on drug administration

From your experience concerning administration of these formulations to children / receiving these formulations, assess the following characteristics of each drug formulation

Syrups					
S3Q1	Swallowability: How easy was it for your child / you to swallow the medicine				
	Not easy at all Very				
	easy				
	1	2	3	4	5
S3Q2	Texture / mouthfeel: How happy was your child with the way the medicine feels in his/her mouth?				
	Not happy at all Very				
	happy				
	1	2	3	4	5
S3Q3	Overall happiness: How happy was your child / were you with the medicine?				
	Not happy at all Very				
	happy				
	1	2	3	4	5
S3Q4	Willingness to keep taking the medicine: How willing was your child / were you to continue use the medicine?				
	Not at all willing Very				
	willing				

	1	2	3	4	5	
S3Q5	Ease of intake: How easy was it for you to administered the drug to you child / to take the drug					
	Not easy at all					Very
	easy					
	1	2	3	4	5	
S3Q6	Overall perception: Overall, how acceptable is the medicine for your child / you?					
	Not at all acceptable					Very
	acceptable					
	1	2	3	4	5	
Tablets						
S3Q7	Swallowability: How easy was it for your child / you to swallow the medicine					
	Not easy at all					Very
	easy					
	1	2	3	4	5	
S3Q8	Texture / mouthfeel: How happy was your child with the way the medicine feels in his/her mouth?					
	Not happy at all					Very
	happy					
	1	2	3	4	5	
S3Q9	Overall happiness: How happy was your child / were you with the medicine?					
	Not happy at all					Very
	happy					
	1	2	3	4	5	
S3Q10	Willingness to keep taking the medicine: How willing was your child / were you to continue use the medicine?					

	Not at all willing willing	Very										
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">1</td> <td style="width: 20%;">2</td> <td style="width: 20%;">3</td> <td style="width: 20%;">4</td> <td style="width: 20%;">5</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	1	2	3	4	5						
1	2	3	4	5								
S3Q11	Ease of intake: How easy was it for you to administered the drug to you child / to take the drug Not easy at all easy	Very										
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">1</td> <td style="width: 20%;">2</td> <td style="width: 20%;">3</td> <td style="width: 20%;">4</td> <td style="width: 20%;">5</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	1	2	3	4	5						
1	2	3	4	5								
S3Q12	Overall perception: Overall, how acceptable is the medicine for your child / you? Not at all acceptable acceptable	Very										
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">1</td> <td style="width: 20%;">2</td> <td style="width: 20%;">3</td> <td style="width: 20%;">4</td> <td style="width: 20%;">5</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	1	2	3	4	5						
1	2	3	4	5								
Oral dispersible												
S3Q13	Swallowability: How easy was it for your child / you to swallow the medicine? Not easy at all easy	Very										
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">1</td> <td style="width: 20%;">2</td> <td style="width: 20%;">3</td> <td style="width: 20%;">4</td> <td style="width: 20%;">5</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	1	2	3	4	5						
1	2	3	4	5								
S3Q14	Texture / mouthfeel: How happy was your child with the way the medicine feels in his/her mouth? Not happy at all happy	Very										
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">1</td> <td style="width: 20%;">2</td> <td style="width: 20%;">3</td> <td style="width: 20%;">4</td> <td style="width: 20%;">5</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	1	2	3	4	5						
1	2	3	4	5								
S3Q15	Overall happiness: How happy was your child / were you with the medicine? Not happy at all happy	Very										
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">1</td> <td style="width: 20%;">2</td> <td style="width: 20%;">3</td> <td style="width: 20%;">4</td> <td style="width: 20%;">5</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	1	2	3	4	5						
1	2	3	4	5								

S3Q16	Willingness to keep taking the medicine: How willing was your child / were you to continue use the medicine? Not at all willing Very willing										
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">1</td> <td style="width: 20%;">2</td> <td style="width: 20%;">3</td> <td style="width: 20%;">4</td> <td style="width: 20%;">5</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	1	2	3	4	5					
1	2	3	4	5							
S3Q17	Ease of intake: How easy was it for you to administered the drug to you child / to take the drug ? Not easy at all Very easy										
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">1</td> <td style="width: 20%;">2</td> <td style="width: 20%;">3</td> <td style="width: 20%;">4</td> <td style="width: 20%;">5</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	1	2	3	4	5					
1	2	3	4	5							
S3Q18	Overall perception: Overall, how acceptable is the medicine for your child / you? Not at all acceptable Very acceptable										
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">1</td> <td style="width: 20%;">2</td> <td style="width: 20%;">3</td> <td style="width: 20%;">4</td> <td style="width: 20%;">5</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	1	2	3	4	5					
1	2	3	4	5							
Powder for solution preparation											
S3Q19	Swallowability: How easy was it for your child / you to swallow the medicine Not easy at all Very easy										
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">1</td> <td style="width: 20%;">2</td> <td style="width: 20%;">3</td> <td style="width: 20%;">4</td> <td style="width: 20%;">5</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	1	2	3	4	5					
1	2	3	4	5							
S3Q20	Texture / mouthfeel: How happy was your child with the way the medicine feels in his/her mouth? Not happy at all Very happy										
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">1</td> <td style="width: 20%;">2</td> <td style="width: 20%;">3</td> <td style="width: 20%;">4</td> <td style="width: 20%;">5</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	1	2	3	4	5					
1	2	3	4	5							
S3Q21	Overall happiness: How happy was your child / were you with the medicine? Not happy at all Very happy										
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">1</td> <td style="width: 20%;">2</td> <td style="width: 20%;">3</td> <td style="width: 20%;">4</td> <td style="width: 20%;">5</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	1	2	3	4	5					
1	2	3	4	5							

S3Q22	Willingness to keep taking the medicine: How willing was your child / were you to continue use the medicine? Not at all willing Very willing				
	1	2	3	4	5
S3Q23	Ease of intake: How easy was it for you to administered the drug to you child / to take the drug Not easy at all Very easy				
	1	2	3	4	5
S3Q24	Overall perception: Overall, how acceptable is the medicine for your child / you? Not at all acceptable Very acceptable				
	1	2	3	4	5
Chewable					
S3Q25	Swallowability: How easy was it for your child / you to swallow the medicine Not easy at al Very easy				
	1	2	3	4	5
S3Q26	Texture / mouthfeel: How happy was your child with the way the medicine feels in his/her mouth? Not happy at all Very happy				
	1	2	3	4	5
S3Q27	Overall happiness: How happy was your child / were you with the medicine? Not happy at all Very happy				
	1	2	3	4	5

S3Q28	Willingness to keep taking the medicine: How willing was your child / were you to continue use the medicine? Not at all willing Very willing					
	1	2	3	4	5	
S3Q29	Ease of intake: How easy was it for you to administered the drug to you child / to take the drug Not easy at all Very easy					
	1	2	3	4	5	
S3Q30	Overall perception: Overall, how acceptable is the medicine for your child / you? Not at all acceptable Very acceptable					
	1	2	3	4	5	
Mini tablets						
S3Q31	Swallowability: How easy was it for your child / you to swallow the medicine Not easy at all Very easy					
	1	2	3	4	5	
S3Q32	Texture / mouthfeel: How happy was your child with the way the medicine feels in his/her mouth? Not happy at all Very happy					
	1	2	3	4	5	
S3Q33	Overall happiness: How happy was your child / were you with the medicine? Not happy at all Very happy					

	1	2	3	4	5	
S3Q34	Willingness to keep taking the medicine: How willing was your child / were you to continue use the medicine? Not at all willing Very willing					
	1	2	3	4	5	
S3Q35	Ease of intake: How easy was it for you to administered the drug to you child / to take the drug Not easy at all Very easy					
	1	2	3	4	5	
S3Q36	Overall perception: Overall, how acceptable is the medicine for your child / you? Not at all acceptable Very acceptable					
	1	2	3	4	5	

Section 7: Opinion on Chewable or oral dispersible forms of moxidectin

See pictures and description of two drug formulations (shown by data collector), and give your opinion

Chewable formulation

4.1. would you/your child like or dislike medicine as chewable?

				
Don't like at all	Don't like	Neither like nor dislike	Like	Like a lot
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4.2. how easy or hard would you/your child find chewable to take?

				
Very hard	Hard	Maybe easy or maybe hard	Easy	Very easy
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4.3. if the medicine only come as chewable, are you / your child likely to take it?

				
Definitely would not	Probably would not	Maybe would or maybe would not	Probably would	Definitely would
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Orodispersible formulation / Melt

4.4. Would you/your child like or dislike medicine as Orodispersible?

				
Don't like at all	Don't like	Neither like nor dislike	Like	Like a lot
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4.2. How easy or hard would you/your child find Orodispersible to take?

				
Very hard	Hard	Maybe easy or maybe hard	Easy	Very easy
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4.3. if the medicine only come as Orodispersible, are you / your child likely to take it?



Definitely
would not



Probably
would not



Maybe would or
maybe would not



Probably
would



Definitely
would

Appendix 2. Interview guides

INTERVIEW GUIDE

IN-DEPTH INTERVIEW FOR PARENTS, CARE TAKERS, CHILDREN AND OTHER MEMBERS OF THE COMMUNITY

Topic: **"End-user perception and preference of 'End-user facing' oral medicines / formulations used to treat young children: a survey of caregivers and children under 12 years of age in Cameroon"** My names are..... CRFiMT. Undertaking a study on the above topic. You have been selected as one of the respondents for this research, I would be grateful if you would spare some time off your numerous important activities in order to participate in this interview. This is purely for research purpose and for the upcoming mass administration of various paediatric formulations in rural settings. The confidentiality of your responses is highly guaranteed.

Thank you for your co-operation

Demographic characteristics of informants

Names of informant.....

Date of birth.....

Sex.....Age.....Ethnic.....

Marital status:number of children.....

Area of residence.....Name of urban town.....

Profession.....Religion.....

Village of origin.....Region.....

Date of interview.....Place of interview.....

Language used for interview.....

I. End-user perception and acceptability of paediatric moxidectin formulation

1. What are your attitude and opinion towards formulation of paediatric moxidectin which can be used for children below 6 years old?

2. What are the perception and attitude of children, parents and care takers towards the taking of this new paediatric formulation of moxidectin by children?
3. Perception towards the quantity of medication given to children?
4. Does this drug formulation ties with your individual cultural values and health believe systems in your community?

II. Experiences faced children

1. How do parents, care takers and children feel about the formulation of moxidectin for children below 6 years old?
2. Do parents, children and care givers understand the formulation and characteristics of Moxidectin.
3. What are the experiences faced by children during drug administration?

III. Preference of drugs for children

1. In what form do children below 6 years prefer drugs? Or in what form do you prefer drugs for children?
2. A. Do you think children prefer drugs in?
 - a) Oral syrups b) oral tablets c) oral dispersity form d) powder solutionB. and why do you think children prefer drugs in this form?
3. How do you assess end-user preferences to the type and form of drugs to be formulated and produced for children below 6 years old?
 4. What form of treatment do you think it is appropriate for children below 6 years old?
 5. How can this drug be formulated for children?

IV. Challenges in storage and mass administration of various paediatric formulation of moxidectin

1. What are the challenges faced in the storage and mass administration of various paediatric formulation in the rural area?
2. What do you think will be challenges faced with respect to the implementation of moxidectin MDA campaign using the storage and administration of drugs?

3. Are there challenges faced by children?
4. What advice can you give as advice with respect to the changes in the formulation of moxidectin for children below 6 years old?
5. What do you think will be the impacts of children taking this new formulation of moxidectin?

IV. Dynamism/changes/innovations in the formulation of moxidectin

1. Are there changes you will want for the formulation of moxidectin?
 - a) If yes, what are your reasons?
 - b) If no, what are your reasons?
2. What are the changes you will need for the formulation of moxidectin for children below 6 years old?
3. How can this drug be formulated for children below 6 years?

INTERVIEW GUIDE

IN-DEPTH INTERVIEW GUIDE FOR COMMUNITY DRUG DISTRIBUTORS (CDDs)

Topic: “**End-user perception and acceptability of ‘End-user facing’ paediatric moxidectin formulation target product characteristics: a survey of caregivers and children under 12 years of age in Cameroon.**” My names are..... CRFiMT. Undertaking a study on the above topic. You have been selected as one of the respondents for this research, I would be grateful if you would spare some time off your numerous important activities in order to participate in this interview. This is purely for research purpose and for the upcoming mass administration of various paediatric formulations in rural settings. The confidentiality of your responses is highly guaranteed.

Thank you for your co-operation

Demographic characteristics of informants

Names of informant.....

Date of birth.....

Sex.....Age.....Ethnic.....

Marital status:number of children.....

Area of residence.....Name of urban town.....

Profession.....Religion.....

Village of origin.....Region.....

Date of interview.....Place of interview.....

Language used for interview.....

I. End-user perception and acceptability of paediatric moxidectin formulation

5. What are your attitude and opinion towards formulation of paediatric moxidectin which can be used for children below 6 years old?
6. What do you think are the perception and attitude of children, parents and care takers towards the taking of this new paediatric formulation of moxidectin by children below 6 years old?
7. What are your Perceptions towards the quantity of medication given to children in the community?
8. Does this drug formulation ties with your individual cultural values and health believe systems in your community?

II. Experiences faced children

1. What are some of the experiences faced by children during mass drug administration in the community?
2. Are there some observations done on children during mass campaign distribution in the community?
3. Are there some of the experiences faced by children during mass distribution campaign in the community?
4. How do you combat this difficulties and handling of children in the community taking drugs during mass campaign?
5. Do children above 6 years effectively take drugs during mass Campaign distribution in the community?
6. How effective is the taking of this drug by children in the community?

III. Preference of drugs for children

1. In what form do children below 6 years prefer drugs?
2. A. Do you think children prefer drugs in?
 - b) Oral syrups b) oral tablets c) oral dispersible form d) powder solutionB. And why do you think children prefer drugs in this form?
3. How do you assess end users preferences to the type and form of drugs to be formulated and produced for children below 6 years old?
 4. What form of treatment do you think it is appropriate for children below 6 years old?
 5. How can this drug be formulated for children?

IV. Challenges in storage and mass administration of various paediatric formulation of moxidectin

1. What are some of the challenges faced by CDD's in the storage and mass administration of various paediatric formulations in the rural area?
2. Do you think there will be challenges faced with the implementation of moxidectin MDA campaign using the storage and administration of drugs?
3. Are there challenges faced by children?
4. As a CDD, What kind of advice can you give as advice with respect to the changes in the formulation of moxidectin for children below 6 years old?
5. What do you think will be the impacts of children taking this new formulation of moxidectin?

V. Dynamism/changes/innovations in the formulation of moxidectin

1. As a CDD, are there changes you will want for the formulation of moxidectin?
 - c) If yes, what are your reasons?
 - d) If no, what are your reasons?
2. What are the changes you will need for the formulation of moxidectin for children below 6 years old?
3. How can this drug be formulated for children below 6 years?

INTERVIEW GUIDE

INTERVIEW GUIDE FOR FOCUS GROUP DISCUSSION (FGD)

Topic: **“End-user perception and acceptability of ‘End-user facing’ paediatric moxidectin formulation target product characteristics: a survey of caregivers and children under 12 years of age in Cameroon.”** My names are..... CRFiMT. Undertaking a study on the above topic. You have been selected as one of the respondents for this research, I would be grateful if you would spare some time off your numerous important activities in order to participate in this interview. This is purely for research purpose and for the upcoming mass administration of various paediatric formulations in rural settings. The confidentiality of your responses is highly guaranteed.

Thank you for your co-operation

Demographic characteristics of informants

Names of informant.....

Date of birth.....

Sex.....Age.....Ethnic.....

Marital status:number of children.....

Area of residence.....Name of urban town.....

Profession.....Religion.....

Village of origin.....Region.....

Date of interview.....Place of interview.....

Language used for interview.....

I. Perception and attitude

1. What are your perception and attitude towards the taking of this new paediatric formulation of moxidectin by children?

2. Does this drug formulation ties with your individual cultural values and health believe systems in your community?

II. Experiences faced by children

1. What are some of the experiences faced by children during mass drug administration in the community?
2. Are there some observations done on children during mass campaign distribution in the community?

III. Preference of drugs for children

1. In what form do you think children below 6 years prefer drugs?
2. A. Do you think children prefer drugs in?
 - a) Oral syrups
 - b) oral tablets
 - c) oral dispersible form
 - d) powder solutionB. And why do you think children prefer drugs in this form?

IV. Challenges in storage and mass administration of various paediatric formulation of moxidectin

1. Do you think there will be challenges faced with the implementation of moxidectin MDA campaign using the storage and administration of drugs?
2. Are there challenges faced by children?
 - a) If yes, what are the challenges?
 - b) If no, why say so?
 - c) What do you think will be the impacts of children taking this new formulation of moxidectin?

IV. Dynamism/changes/innovations in the formulation of moxidectin

1. As a CDD, are there changes you will want for the formulation of moxidectin?
 - a) If yes, what are your reasons?
 - b) If no, what are your reasons?
2. What are the changes you will need for the formulation of moxidectin for children below 6 years old?
3. How can this drug be formulated for children below 6 years?