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Perception and social acceptability of the extension of chemoprevention of seasonal malaria in thehealth districts of Damagaram Takaya and Takeita in Niger

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Abstract

Objective: To assess the perception of the extension of seasonal malaria chemoprevention (SMC) and its social acceptability.

Methods: The data used in this study comes from a qualitative survey commissioned by The London School of Hygiene & Tropical Medicine and conducted in October 2022 in the Damagaram Takaya and Takeita Health Districts, Zinder region. Four focus groups were carried out per health district with members of the Health Management Committee (COGES), distributors, fathers of families benefiting from the extension of the SMC and mothers (baby-sitters). In addition to the focus groups, individual interviews were conducted with health staff, authorities and other stakeholders involved in implementing malaria control policies. The data collected was transcribed and then summarised in a matrix to serve as a basis for this work.

Results: The population was aware of the extension of the SMC and was in favour of receiving it again. The extension of the SMC is accepted, but the side effects of taking the drugs are the main obstacle to the success of the operation. In practice, the 2nd and 3rd doses are not always administered as scheduled, either because they are forgotten or because they are kept in reserve for future treatment. As far as the communication system is concerned, town criers and health workers are the most effective means of reaching the population.

Conclusion: The extension of the SMC is well received by the community. However, to achieve its objectives, means must be found to monitor the administration of the 2nd and 3rd doses to children. Similarly, its success depends on the number of teams and distribution days now that the target is almost doubled.

Keywords: Extension; Seasonal malaria chemoprevention; Perception; Acceptability; Niger

1. Introduction

Malaria is endemic throughout the world. Africa is the continent where almost all cases of malaria occur. According to the WHO report on malaria in 2022, 95% of malaria cases worldwide will occur in Africa, compared with 2.5% in the Eastern Mediterranean, 2% in Southeast Asia, 0.6% in the Western Pacific and 0.2% in the Americas [1].

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In Africa, Nigeria is the most affected country by malaria in 2021, followed by the Democratic Republic of Congo (DRC), Uganda and Mozambique. These four countries account for almost half of all malaria cases [1]. Niger ranks 7th.

Regarding the malaria mortality rate, 96% of deaths occur on the African continent. Behind Nigeria (31.3%), the DRC (12.6%) and Tanzania (4.1%), Niger is the 4th country with the highest malaria mortality rate at 3.9% [1]. Malaria is therefore endemic in Niger, with a prevalence rate of approximately 29% among children aged 6-59 months: almost 3 out of 10 children have tested positive for malaria [2].

In March 2012, the WHO published a health policy recommendation in favour of a new intervention against Plasmodium falciparum malaria: seasonal malaria chemoprevention (SMC) [3]. SMC is a prevention method that consists of intermittent administration of a full course of sulfadoxine pyrimethamine plus amodiaquine during the high transmission season. This intervention aims at preventing malaria infection by maintaining therapeutic blood levels during the period when the risk of transmission is highest [4].

In Niger, the National Malaria Control Programme (Programme National de Lutte contre le Paludisme- PNLP) has been implementing the SMC at the national level since 2016. It takes place every year from July to October and coincides with the rainy period (period of high malaria transmission), i.e., 4 monthly cycles. [5].

Several studies on SMC in the Sahel, and more specifically in Niger, have shown its impact on the prevalence and incidence of the disease in the target population (children under 5) [6]. In addition to these studies, the results of an ACCESS-SMC (Achieving Catalytic Expansion of Seasonal Malaria Chemoprevention in the Sahel) consortium partnership in several African countries point in the same direction and conclude that SMC is a promising intervention in malaria elimination efforts in areas where it is implemented [7].

However, despite these encouraging results, other recent studies show that a significant peak in malaria infection is observed in older children [8]. Additionally, among children who received SMC, a rebound in malaria incidence was observed after four cycles of SMC [9].

In the light of these observations, the NMCP Niger, with its partners, is extending the SMC to five cycles in the Zinder region (Damagaram Takaya Health District and Takéita Health District) and to children between from 5 to 9. Following this pilot phase, studies will be carried out to enable a decision to be made on implementing this extension on a national scale.

It was against this backdrop that a qualitative survey was carried out in these two districts to assess the community's perception of the extension of SMC to five cycles and to children aged between 5 to 9 in the Zinder region.

2. Material and methods

2.1. Nature of the study

The data used in this analysis comes from a purely qualitative study carried out by the London School in Zinder (Niger). It was carried out to help in the decision to extend SMC nationally in Niger.

2.2. Survey population

The target population for this study were mothers and fathers of children, distributors of SMC, SMC members and health staff at each level (district, regional and national).

2.3. Sampling methods

Focus group discussion (FGD) participants are randomly selected on the basis of the people present in the district after the community awareness campaign.

2.4. Collection methods

Focus groups were held for each type of participant, enabling us to gain a better understanding of the communities' expectations, any obstacles and the solutions to be implemented to overcome them. Participants were recruted on the basis of a filter establishing the conditions of eligibility. The participant's consent to take part in the group under the conditions presented was also obtained beforehand. The focus groups were moderated on the basis of an adapted

moderation guide designed to open up discussions and provide a better understanding of behaviour on the issues raised. A total of eight focus groups were held. With the exception of the "SMC members"; the other discussion groups are made up of a minimum of 10 people to ensure the richness of the information gathered.

The focus groups took place in EPI (Expanded Programme on Immunisation) rooms in each of the two districts in which the extension was tested in the Zinder region. These focus groups generally lasted for one to two hours. As the data collection methodology provided for the audio recording of all the discussions on digital media, the participants' consent was taken before the start of each discussion. After the recording, the audios were transcribed into the input masks created for this purpose for analysis according to the following themes: knowledge and practices associated with the extension of the SMC, acceptability of the extension, means of communication, expectations of SMC activities, suggestions for improving SMC activities and possible obstacles to achieving the objectives of SMC extension.

2.5. In-depth one-to-one interviews with distribution players

Individual interviews were conducted at three different levels: central, regional and district. As mentioned above in the target section of the study, three staff members were interviewed at the central level, compared with four staff members at the regional level and in each of the two districts surveyed.

A total of 15 individual interviews were conducted by twelve interviewers and three supervisors. The people interviewed at each level (central, regional and district) had already been selected by those commissioning the data collection.

The various interviews with the participants were conducted using a semistructured interview guide. As with focus groups, the discussions which generally took place in the offices of the people concerned, were recorded and then transcribed for analysis as part of the study.

2.6. Variables under study

This study focuses on the following variables: perception of the extension of the SMC, concern about the SMC campaign, knowledge of the SMC, SMC practices, acceptability of the extension, and means of communication from the central level to the regional and district levels.

2.7. Data analysis

After the fieldwork phase, a plenary session was held, followed by a final audit, which consisted of collecting all the exchanges and information from the observations, individual interviews and focus groups. As part of this study, the data was coded manually according to the objectives. The database resulting from the data processing was used as a source for the data analysis.

2.8. Ethical aspects

In this study, anonymity was maintained throughout the processing and analysis of the data while respecting confidentiality. All the work was carried out under the approval of the ethics committee made up of the teaching researchers.

2.9. Duration of data collection

The data collection itself was carried out over twelve days, from 9 to 20 November 2022.

3. Results

3.1. Knowledge and practices associated with SMC extension

3.1.1. Knowledge

Almost all the women in the focus group were familiar with the SMC, whether in Takieta or Damagaram Takaya. However, they were not aware of its extension. In Damagaram Takaya, the women said they were aware of the extension of SMC to five cycles and to children aged 6 to 9.

"Yes, we know that the SMC is now carried out five times a year and now takes into account our children under the age of 10" [FGD Femmes DTK].

On the other hand, the women of Takéita are not aware of the extension of the SMC to older children. Nevertheless, some of the women said that the distributors had visited their households five times this year, as opposed to four times in previous years.

"I have not heard that the SMC will be extended to our older children. However, the distributors have given my children SMC five times this year. I do not know if that is what you're talking about » [FGD Femmes Takeita, Nov 2022].

The members of the management committees of the CSIs in the two intervention villages are supposed to be at the heart of information relating to the SMC and even its extension. However, this is not the case for the members of the Damagaram Takaya SMC. They learn about the extension of the SMC through a health worker rather than being officially informed at SMC meetings. According to them, they are not involved in SMC-related activities.

"I heard about it from a health worker with whom I have a good relationship. ...

The SMC is not involved in SMC activities, either through training or even an information meeting. That is why we keep ourselves informed through our relations with the agents" [FGD_COGES_DKT].

The Takéita SMC members are involved in all SMC activities and are aware at all times of the decisions taken by the SMC. They are fully *aware of the extension of the SMC. They learned about it at a meeting to which they were invited.*

"I learned that there were plans to extend the SMC at a meeting organised by the CSI major, where he invited village chiefs, religious leaders, the COGES and some traditional medicine practitioners to inform us that this year there are plans to extend the SMC to include (a 5th cycle/children under 10). However, the extension to include children under 10 will not be tested here. That is how I determined about the SMC extension" [FGD_COGES_Takeita].

The distributors are well aware of the extension of the SMC. Damagaram Takaya's distributors learned about it during the training for the first pass. They know how to keep things in their various perspectives. According to them, at Damagaram Takaya, the SMC has been extended to 5 cycles and now includes children aged 3 months to 9 years.

"During the first training session, when we wanted to do the first pass, we learned that the SMC will be extended to children aged 6 to 9 only in Damagaram Takaya and a 5th pass will be added in Damagaram Takaya and Takéita" [FGD_Distributors_DKT].

In Takéita, however, the program has been extended to 5 cycles, but the target population remains children aged between 3 and 59 months.

"It was our various chiefs, superiors and above all our authorities who informed us of the extension of the SMC during the training of the distribution agents". [FGD_Distributors_Takeita].

3.1.2. Practice

Although not all women are aware of the SMC extension, they still receive SMC tablets whenever the distributors pass by.

When asked whether they administer the 2nd and 3rd doses to children, some women say they administer the doses according to the instructions left by the distributors.

"...I always gave my children the 2nd and 3rd doses the day after and the day after the distributors came, following the instructions they gave us" [FGD_Femmes_DTK].

However, others did not administer the 2nd/3rd doses on the pretext that they had forgotten. Failure to monitor the administration of the 2nd/3rd doses of SMC does not guarantee that the drugs are actually administered as planned. This could have adverse effects on the expected results of SMC campaigns. A mechanism should therefore be put in place to monitor the administration of the recommended doses.

> *"Honestly, I did not give the 2nd and 3rd doses to all the children. I sometimes forget and it is days later when I'm looking for something that I come across it and realise that I hadn't administered as recommended" [FGD_Femmes_ Takeita, Nov 2022].*

Forgetfulness is not the only reason for not administering the 2nd/3rd doses. Side effects from the first dose and the bitter taste of the medicine are the other reasons given by women who have not taken the last doses. According to them, the side effects experienced by the child after the first dose mean that they no longer have the courage to administer the remaining doses.

The other aspect is the bitter taste of the medicines, which makes children refuse to take the rest of the doses.

> *"If the child expresses side effects after the first dose, I no longer have the courage to give the remaining doses for fear that it will worsen the child's condition. Sometimes the child refuses to take the medicine, saying it is bitter" [FGD_Femmes_Takeita, Nov 2022].*

Among those who did not take the tablets, some saved them to give to their children when they showed signs of malaria. These women see SMC tablets as a means of treating malaria rather than as a preventive measure. Awareness campaigns are therefore needed to explain to these women that SMC products are not intended for the treatment of malaria.

> *"I think that if the child has received the first dose of SMC, he is already protected for a given period. So I keep the tablets as a back-up to give him the rest if he develops malaria during the month" [FGD_Femmes DTK].*

In practice, some women administer the doses but not within the allocated time. They explain that doses spread over three days do not guarantee protection for their children throughout the month. They therefore administer the doses at 10-day intervals. It is therefore important to find a mechanism to overcome this practice, which prevents SMC campaigns from achieving their objectives.

> *"Sometimes I think that if I administer the tablets to the children on three successive days, it will not protect the child for the whole month before the next visit. So I administer the tablets to the children ten days at a time so that the child has immunity throughout the month, hoping that one dose will give the child immunity for ten days or so" [FGD_Femmes_DTK].*

Due to the bitter taste of the tablets, some women say they have administered them with sugar.

> *"The tablets are truly bitter... we administer the tablets with sugar, whether the agents have given it to us or not" [FGD_Femmes_Takeita, Nov 2022].*

Women use a variety of techniques to make it easier to take the tablets. The methods of administration listed by women include dissolving the medicine and crushing the tablets.

> *"For infants, I dissolve the medicine with a sugar cube in a bowl or I crush it and mix it with a small amount of water" [FGD_Femmes_DTK].*

SMC members are first and foremost parents of children. As parents, they claim to administer all 5 doses to their eligible children in order to set a good example for other parents. They do this while respecting the instructions given by the distributors.

According to distributors, the extension of the SMC has not changed the way tablets are administered to children. The only change is that they have to come back a fifth time instead of four. They state that they check children's ages before administering any tablets.

> *«Once in the households, we check the ages of the children to identify those who are eligible. Only then do we move on to administration" [FGD_Distributors_DTK].*

For the administration of the tablets on the first day, the distributors say that they administer the tablets themselves to the eligible children and then leave the children's tablets for the 2nd and 3rd doses on the following two days.

"First, we give the large and small tablets with a sugar cube to the children (swallowing, dissolving, crushing), usually in the presence of the mother. When we leave, we give the mother the remaining tablets with 2 sugar cubes so that she can administer them to the children over the next two days" [FGD_Distributors_ Takeita].

3.2. Acceptability of the SMC extension

The plan to extend SMC to five cycles and to children aged 6 to 9 seems to be good news for the population of the two departments where the experiment took place.

For the women in the Damagaram Takaya focus group, the SMC medicines are effective in treating and protecting children aged between 3 and 59 months.

"The products we receive treat and protect children against malaria. They are very effective in preventing malaria. » [FGD_Femmes_DKT].

For them, extending it to five cycles means treating and protecting children throughout the rainy season. Extending it to children aged 6 to 9 also means protecting and caring for all children vulnerable to malaria. The family is thus protected if the children are immunised.

"For me, moving to 5 cycles and taking into account children aged 6 to 9 means protecting the whole family. If vulnerable children are protected, then the whole family is protected. In addition, 5 cycles means protecting and caring for children throughout the rainy season » [FGD_Femmes_DKT].

The women of Takieta did not disagree with the women of Damagaram Takaya. In their opinion, the extension is a very good initiative because it helps children a great deal in the prevention of certain diseases such as malaria. They are therefore prepared to have SMC administered to their older children.

"We think it is a great initiative because it helps children a lot in the prevention of certain diseases such as malaria and others in children" [FGD_Femmes_Takeita].

The extension of the SMC is also much appreciated by SMC members from Damagaram Takaya and Takéita.

For the members of the Takéita SMC, the extension of the SMC is the fulfilment of their wishes. They wanted the SMC to start a month earlier and last throughout the rainy season.

"...we have always wanted the SMC campaign to start a month before the rainy season and to last throughout this period in order to provide protection for children during this time of malaria risk. When we heard that this year there would be an extension, we were delighted because it was something we had always wanted" [FGD_COGES_Takeita].

In the same vein, DTK's SMC members stated that the extension, whether based on age or the number of cycles, is a good initiative. Apart from the fact that it responds to the population's concerns about malaria by reducing the incidence of malaria, it limits the crowds in health centers and, eventually makes malaria treatment centers less efficient.

"...the SMC has proven effective in significantly reducing the number of cases of malaria in the target area. Before, when the rainy season arrived, the population's main concern was malaria in children, because we recorded a lot of cases, the health centers were saturated, and the workers were overwhelmed by the number of patients, which meant they had to work 24 hours a day, something we no longer see since the introduction of the SMC, so I think this extension, whether in terms of age or the number of cycles, is a good thing" [FGD_COGES_DTK].

The distributors, being in contact with the women during the distribution campaigns, have already collected favorable opinions on the benefits of SMC. DTK distributors said that women told them that SMC had helped to reduce the number of cases of malaria.

"...people tell us that everything is going on well, there has been a relapse of malaria cases as far as we have seen" [FGD_DTK_Distributors].

In terms of their own opinions, DTK distributors think it is a good thing to think approximately 5 cycles. The 4 cycles we used in the past did not contain malaria cases.

"...there used to be only 4 cycles, and these 4 cycles were not enough to contain the cases of malaria. It is a truly good thing we thought of a 5th cycle because the month following the 5th cycle, there are no more mosquitoes... » [FGD_DTK distributors].

According to Takéita distributors, the extension of the age limit is a very good thing and will mean that distributors are no longer seen as villains by women. Before the extension, during distribution campaigns, women would put pressure on them to ensure that SMC medicines were also administered to older children. When they did not accept this, the distributors were seen as bad people.

"The population is very grateful and happy about the increase in the 5th cycle because it is a very good thing... For those aged 5 or over, their parents insisted that they be given medicines, and some parents lowered the child's age just to receive these medicines. That is why raising the age of the children concerned is a very good thing and everything will be fine" [FGD_Distributeurs_Takeita].

In the field, distributors were always asked to explain why the SMC only covered children under the age of 5, when everyone is vulnerable to malaria. They admit that they are always embarrassed to answer this question. They are therefore very pleased that the SMC has been extended.

"We were truly pleased when we were told that the age range had been increased from 5 to under 10. Before, parents were asking us why we were stopping at under 5 s, so we felt embarrassed, but now with the increase in this age group, alhamdullilah, we will be able to do our job very well" [FGD_Distributors_Takeita].

3.3. Means of communication between central, regional and district levels

The most frequently used source of communication in the hierarchical chain remains administrative correspondence. If the decision is made at the central level (Ministry of Public Health, PNLP and partners), a letter is sent to the regional level. The regional level then forwards the letter to the various districts under its authority. Finally, it is up to the districts in turn to forward the letter to the Integrated Health Centers in their area of responsibility.

"It is the central level that makes the decision. We are informed by administrative mail. The central level informs the regional levels, the regional levels inform the districts and the districts inform the CSIs" [Interview_DRSP_Zinder].

In addition to administrative correspondence, participation in decision-making, training and information meetings, and meetings to draw up the annual sector plan ensures that the various levels are kept informed of what is going to be done.

"Sometimes we are informed in advance if we take part in decision-making, training or information meetings, or in meetings to draw up the sectoral annual plan. However, even if we are informed in this way, the letters formally confirm the information and specify the implementation date" [Interview Chief Medical Officer_DKT].

3.4. Means of communication between health facilities and the community

Communication with the community is very important to the success of the SMC extension.

According to the Takéita Chief Medical Officer, he passes on information about the extension of the SMC in several ways. First, he organises a meeting to which he invites the CSI chiefs and the administrative authorities at various levels in his area. After this meeting, he recommended that the CSI chiefs do the same in their CSI.

"For such crucial information, I organise a meeting to which I invite the local authorities and the CSI Chiefs to inform them of the decision taken by the central level and how it would be implemented to achieve the expected results" [Interview_Chief_Medical_Takeita].

He then contacted local radio and television stations to broadcast press releases in French and Hausa. Advertising spots were produced and aired several times before and during the campaign.

"...To get the information out to the masses, radio and television are the means we use through press releases and adverts in French and local languages" [Interview_Médecin Chef_Takeita].

At the CSI level, meetings are also organised by the majors to inform opinion leaders about the SMC extension project. These include SMC members, village chiefs, religious leaders and traditional medicine practitioners.

> *"I learned that there were plans to extend the SMC at a meeting organised by the CSI major, where he invited village chiefs, religious leaders, the COGES and some traditional medicine practitioners to inform us that this year there are plans to extend the SMC to include (a 5th cycle/children under 10), even though the SMC will be extended to include (a 5th cycle/children under 10). the extension to include children under the age of 10 will not be tested here - that is how I learned about the SMC extension" [FGD_COGES_Takeita].*

3.5. Expectations of the SMC

In all the focus group discussions, expectations of the SMC mainly concerned the bitter taste and side effects of medicines.

The majority of mothers and care-takers suggested that the bitter taste of the medicines should be reviewed. For them, this taste had a negative impact on taking the 2nd and 3rd doses of SMC products.

> *"..., if the child takes the 1st dose on the first day, it is difficult for him to take the other doses if he remembers the taste of what he took the day before. You may have to beg or threaten them before they take it involuntarily" [FGD_Femmes_Takeita].*

In addition to the bitter taste, they suggest that work should be done on medicines to reduce as much as possible the side effects they cause.

> *"....I sometimes try to justify side effects in my children by their age. However, I have come to understand that age truly is not the determining factor. In one family, you will learn that it is the youngest who has had side effects, while his older brothers have nothing to say. In addition, in another, they will tell you that it is the oldest who has had side effects but not his younger brothers" [FGD_Femmes_DTK].*

Obviously, not all children experience side effects, but the mothers suggest that experiments be carried out to identify the factors that explain side effects in children so that medicines can be adapted to children in this category.

> *«.My suggestion is simply that partnerships should seek to identify the determinants of side effects in children who express them. This could make it possible to adapt medicines to children according to their characteristics, apart from age" [FGD_Femmes_Takeita].*

Some women questioned the number of distribution agents and the number of distribution days per village. They are waiting for the number of distribution teams or the number of distribution days per village to be reviewed. According to them, in the villages that are a little scoured, where the villages are made up of a village center and several hamlets scattered across the desert, the distribution agents, who do not have enough days, do their best but still do not manage to reach all the concessions. Indirectly, households that are absent during a first visit will not get a second chance during this visit.

> *"We need to increase the number of distribution teams or the number of distribution days per village. Some villages are composed of hamlets scattered across the desert. It is difficult for distributors to give the hamlets the time they need for full coverage" [FGD_Femmes_DTK].*

3.6. Expectations regarding the communication campaign

As far as communication is concerned, the main means of communication through which beneficiaries determined about the extension of the SMC was "town criers". They prefer this channel to others such as radio, television and billboards. These methods are only effective in urban areas. In rural areas, where radio and television are not available to everyone, the channel preferred by beneficiaries is town criers.

> *"It is true that in the city, radios and televisions broadcast the news. However, not everyone has access to these channels. We prefer town criers, as they are effective in scourged areas" [FGD_ COGES_Takeita].*

3.6.1. Suggestions for improving coverage

To improve the current rate of coverage, beneficiaries and local stakeholders have called for greater emphasis to be placed on raising awareness and for more resources to be made available to distributors so that they can do their job properly.

For their part, Takeita's men suggested finding ways of getting to hard-to-reach areas and going to public places (markets, schools, places of prayer, etc.) to cover the countryside.

> *"... it is like what they're doing now, but there are places where it is difficult to go. I think when we find ways to go everywhere, the purpose of these activities will be achieved." [FGD_Hommes_Takeita]*

> *"It is about finding people wherever they are. Even if they're not there, find a way to come back" [FGD_Hommes_Takeita].*

> *"...and to find a way of distributing to every corner, regardless of location" [FGD_Hommes_Takeita].*

Focus group participants, especially distributors and SMC members, spoke at length about the availability of SMC products. According to them, the quantity of products allocated to the population was not sufficient, even though there was no extension. Now that there is an extension, the IHCs will need to have enough blister packs of SMC tablets to cover all eligible children.

3.6.2. Suggestion for ensuring full cover

To ensure total coverage, the groups of people interviewed made various suggestions.

These suggestions include involving the SMCs and traditional and religious leaders in awareness-raising activities about the extension of the SMC, increasing the number of community relays and ensuring that sufficient tablets are available.

> *"...we need to integrate the SMC, which is the population's representative in the health centers, and integrate the traditional and religious leaders into the SMC's activities because this group of people has the capacity to influence and change the population's behavior towards the SMC..." [fgd_coges_dtk]. [FGD_COGES_DTK].*

In addition to this suggestion, the women of Takéita strongly recommend raising public awareness of the usefulness and importance of SMC.

> *"...by making them aware of the importance of the SMC campaign and the usefulness of medicines in a child's body" [FGD_Femmes_Takeita].*

> *"...it is enough to bring parents together in one place to inform them about the objective and effectiveness of SMC in the fight against malaria in Niger" [FGD_Hommes_Takeita].*

Finally, other parents spoke at length about the side effects of SMC products. They suggested reducing side effects as much as possible to ensure full coverage.

3.7. Concern about the SMC campaign

The SMC campaign and its extension raise concerns among the population surveyed. The majority of those who are concerned about the SMC campaign are mainly worried about the side effects of taking SMC products. They said that after taking the drugs, the children were weakened and dizzy. For them, the dosage exceeds the children's resistance capacity.

> *"Some children cannot cope with the medication. They feel weak and dizzy after taking the tablets. This may be because the dose is too high for their body" [FGD_Distributors_Takeita].*

On the other hand, some people do not trust products because they are free. According to them, free products kill!

> *"During distribution campaigns, we sometimes hear rumours that the medicines can be harmful because they are free. Some parents do not trust us because of this". [FGD_Distributors_DTK].*

The members of the SMC are concerned about the success of the SMC extension campaign, given the lack of resources and communication time required to raise awareness.

> *"My concern about the SMC campaign is that awareness-raising is still lacking. We wanted the time and resources allocated to awareness-raising to be increased in the ToR. Because the majority of the population is illiterate, we need much more time and resources to raise awareness effectively" [FGD_COGES_DTK].*

However, some parents (DTK men) are not worried at all, even though the distributors are brothers and sisters in the village. So they cannot consciously bring in something that will harm the population.

> *"We're not worried about this campaign because even the distributors are from our region. Under no circumstances are they going to bring us anything that will harm our children" [FGD_Hommes_DTK].*

3.8. Refusal by certain families

Clearly, there are no families refusing the SMC and its extension in Takéita Village. However, in Damagaram Takaya, there have been refusals due to ignorance of the importance of the SMC and a lack of information about it.

Of course, they are afraid of the side effects, but they believe the conspiracy theorists who think that SMC prevents children from having children.

> *"...The refusals are due to a lack of information because they have little or no awareness of SMC. This makes them vulnerable and makes them believe the conspiracy theorists who think that the reason for SMC is not to prevent malaria but rather to prevent children from procreating" [FGD_COGES_DTK].*

3.9. Cover

3.9.1. Perception of the extension's coverage

For any vaccination activity aimed at eradicating or preventing a disease in a targeted population, the coverage rate is and remains an indicator of the success of the activity.

In Niger, specifically in the Zinder region, the objectives of extending the SMC will be achieved if it covers all or at least the majority of the children targeted.

The results of the qualitative study carried out among the inhabitants of the trial sites for the extension of the SMC in Niger revealed that distributors of SMC products are obliged to visit every house to reach all the children targeted.

> *«....We go into each house to distribute the medicines because each distributor has a piece of land allocated to him» [FGD_Distributeurs_DTK].*

The distributors in the second village, Takéita, even claim that it is their duty to visit every house.

> *"... it is our job, it is our duty to go into every home and give the SMC to every child" [FGD_Distributors_Takeita].*

However, the women in the focus group discussion in Takéita think that although the distributors go to all the houses, the intensity of economic activities (in this case farming activities) during the SMC campaign period (rainy season) means that *some parents and therefore some targeted children are missed.*

> *"During this rainy period, it is mainly the 7-, 8- and 9-year-old children who are not easily found at home. They spend all day in the fields doing field work" [FGD_Femmes_Takeita]*.

However, to give a second chance to these children who missed the first round, the men in the focus groups said that the distributors took an appointment to come back or stay with the village chiefs to receive the missed children.

> *"...they take an appointment with the child's mother to come back and see if the children are there" [FGD_Hommes_DTK].*

"Yes, when they have finished giving from house to house, they also come back to the neighborhood chief to make an exception for those who have not had anything, and almost all the children in the village would get their share" [FGD_Hommes_Takeita].

4. Discussion

The data analysed in this study comes from the purely qualitative survey carried out in Niger by London School and CRS to gather the perceptions of beneficiaries and those involved in implementing the SPF on its extension. The results of this study will make it possible to determine the extent to which the extension of SPF will be implemented on a national scale.

4.1. Perception and acceptability

In this study, perceptions of the extension of the SMC to five cycles and to children aged 6 to 9 were gathered from baby-sitters, SMC members and distributors. Overall, it was well received and accepted by all. The extension of the SMC is simply the fulfilment of the wishes of the majority of the population, as it has an impact on prevalence, malaria incidence and hospital attendance for malaria. This result is consistent with those obtained in the studies by M. Mahamadou (2021) and Diawara et al. (2021). [10,11]

However, part of the study carried out in Chad in 2021 by the Malaria Consortium contradicts this overall favourable opinion. According to the study, some key informants found the extension pointless and suggested that the funds allocated to the extension should be redirected to better cover children under 5. [12]

4.2. Concerning the practice of SMC

The results of this study show that SMC and even its extension are practised in all households, with the exception of a few houses where the guardians do not give permission. This result is consistent with those obtained by El Hadji Ba et al. in Senegal at the Malaria Research and Training Center in 2015 in Mali.

M. Mahamadou in 2020, and M. Adbourhamane in 2022 [10, 13, 14, 17].

However, although it is widely practiced, only the 1st dose is guaranteed. The 2nd and 3rd doses are not administered in all households because of forgetfulness, side effects caused by the 1st dose, the bitter taste of the medicines or the need to save tablets. This result is in line with Diawara et al. in 2017 [15].

4.3. Concerning the obstacles to achieving the SMC objectives

Although the extension of SMC is well perceived and accepted by the vast majority, there are many other factors that could hinder the achievement of the policy's objectives. The results of this study highlight the side effects (diarrhea, malaise, vomiting and feeling tired after taking the drugs) as the main obstacle to the extension of SMC. The results of Diawara et al. (2021) and Musawenkosi et al. (2021) support this conclusion [15,16].

In addition, the fact that the tablets are free makes some parents reluctant to take them because for them, free tablets kill them. This is a new finding in the literature to which we have access.

Among SMC members, the concern lies in the availability of sufficient financial resources to ensure the extension and the lack of communication time to successfully raise awareness.

Finally, there is an absurd idea that can act as a brake on extension. Some parents believe that SMC is designed to prevent children from being born or to limit the number of children per woman. In the literature, no study has obtained such a result. For this to happen, a great deal of effort will have to be made to raise awareness so that beneficiaries have a clear idea of the objectives of SMC and how it can be extended. They also need to know that SMC is a preventive and not a curative strategy.

5. Conclusion

This study examines the perception and acceptability of the extension of SMC in Niger. It is part of the research linked to the implementation of the SMC extension. To do this, we used data from the qualitative survey carried out in Zinder by a team of interviewers who worked on Damagaram Takaya and Takeita.

Our results indicate that the majority of women and men in the focus group discussions are aware not only of the SMC but also of its extension. In addition to their knowledge, the beneficiaries (with the exception of a few) have a good perception or appreciation of SMC. They believe that SMC protects children against malaria. They are therefore in favour of extending it. However, with regard to its use, they do not all administer the 2nd and 3rd doses on the pretext that they have forgotten or because of the side effects of the 1st dose.

As far as the communication campaign before and during the SMC is concerned, it was felt that town criers should be used, especially in rural areas, as not everyone has access to other means of communication such as radio and television.

Regarding the likely obstacles to achieving the objectives of extending the SMC, there is the failure of mothers to comply with dosages, concerns about the drugs because of their free nature, taste and side effects, and the refusal of some parents to participate due to lack of proper information. Added to all these are rumours that SMC is intended to limit the births of their children.

Among the proposals made to remedy the situation was the suggestion of an experimental study to investigate the determinants of side effects in certain children, with a view to adapting SMC medicines to those children who experience side effects after taking the tablets. It was also suggested that the medicines should be made more palatable and that the number of teams and even the number of days of distribution should be increased. Before the extension, the teams were unable to cover the entire population. Now that the program has been extended, the target population is growing.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of ethical approval

'The present research work does not contain any study performed on animal/human subjects by any of the authors'.

Statement of informed consent

Before forming the focus groups, we read the informed consent form to each of the likely participants. And each participant gives their consent orally before being included in the focus group.

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