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Perceived Barriers and Opportunities to Offering Ivermectin Continuously in the Primary Health Care System: An Exploratory Study of Stakeholders in Cameroon

Center for Research on Filariasis and other Tropical Diseases and the Health Campaign Effectiveness Program at The Task Force for Global Health

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Key Messages

- Partial integration of ivermectin into the primary health care system is perceived by stakeholders and community members as a simple and easy-to-implement approach, with stakeholders at different levels highly motivated to try it.

- Adding continuous distribution of ivermectin in health facilities to the usual mass drug administration campaigns also represents an opportunity to sustain ivermectin administration in case of funding shortages.

- Key challenges identified were motivation of community drug distributors, management of adverse events, and risk of misuse of ivermectin. They can be addressed by involving the same community drug distributors in other health programs, using the same resources as during mass drug administration campaigns to manage adverse events, and ensuring close supervision and regular reporting of ivermectin stocks.

Abstract

Onchocerciasis is endemic in about 60% of health districts in Cameroon despite decades of ivermectin (IVM) treatment. Absences during mass drug administration campaigns and community drug distributors failing to deliver the treatment in households were key determinants of this implementation gap. We conducted a study of the challenges and opportunities to partial integration of IVM distribution into the primary health care (PHC) system. This was a mixed-methods (qualitative and quantitative) study using in-depth interviews to capture information from stakeholders at all levels and focus group discussions at the community level. Quantitative data on cost and drug coverage were extracted from campaign reports of districts. We included 130 participants from five regions of Cameroon. Partial integration was perceived as a simple and easy-to-implement approach by stakeholders at different levels of the health system, health workers, and community members, and they were also highly motivated to try it. It also represented an opportunity to sustain IVM administration in case of funding shortages. Management of adverse events and risk of misuse of IVM were the key challenges identified. Treatment of one person costs about 53 CFA Francs (95% CI: 32.8 – 73.0). Trials to assess the real potential impact of this integration with the primary health care system are highly needed.

Introduction and Background

Onchocerciasis or river blindness represents the second most important infectious cause of blindness after trachoma [1], infecting an estimated 21 million people worldwide in 2017, with more than 99% of them living in 31 African countries, including Cameroon. Community-directed treatment with ivermectin has been the main strategy proposed by the World Health Organization to fight against onchocerciasis in Africa [2]. This strategy has contributed to transmission interruption and/or elimination of the disease in many countries, indicating effectiveness. Notwithstanding, the disease remains endemic in 60% (113/189) of health districts in the ten regions of Cameroon, with prevalence above 60% in some health districts of the Centre, Littoral, and West regional community-directed treatment with ivermectin projects [3]. Absences during mass drug administration (MDA) campaigns and community drug distributors failing to deliver the treatment in households were key factors impacting noncompliance and indicators of an implementation gap [4,5]. Our study of challenges and opportunities to partial integration of IVM distribution into the primary health care (PHC) system contributes to overcoming the implementation gap as suggested by Bhatnagar et al [6].

Objectives and Research Questions

In this study, we assessed challenges encountered in the continuous distribution of ivermectin through local health facilities after MDA campaigns, as well as the opportunities that may serve as leverage for the integration of ivermectin administration into the PHC system.

Research questions were stated as follows:

- **Primary research question –** What are challenges and opportunities of partial integration of ivermectin mass drug administration into the primary health care system?

- **Secondary research question –** What is the cost-effectiveness of ivermectin mass drug administration through campaigns?

Methods

Qualitative Component

To capture perceptions of stakeholders concerning challenges and opportunities of integrating IVM-MDA into PHC system activities, we conducted in-depth interviews with NGOs, central, regional, and district stakeholders. A semi-structured questionnaire was used. Before the interview, the purpose and the aim of the study was explained to the participants, and the informed consent form was signed.

Communities were selected for involvement in the study according to drug coverage during the last IVM campaigns, whereby communities with the highest and lowest coverage rates were selected. In-depth interviews and focus group discussions with community members were carried out. The aim was to capture the perception of participants concerning barriers to delivery of IVM through the PHC system, and opportunities that may be taken to increase the probability of a successful integration. In-depth interviews targeted community members and local health workers, with the same aim as the focus group discussion. The interviews were transcribed verbatim and read several times for familiarity, patterns identification, and code generation. Similar codes were grouped together to generate themes. Codes and subsequent themes were reviewed and interpreted by considering the participants' perception of challenges and barriers to IVM distribution integration into the PHC system. Thematic analysis was carried out following the protocol of Braun and Clarke [7]. Quotations from interview transcripts are presented as examples of emerging themes. Qualitative data were analyzed using ATLAS.ti version 22. Furthermore, a deliberative forum was organized with key informants randomly selected among the study population, in order to present the results of the study and have their feedback as well as specific actions they can take regarding those results.

Quantitative Component

Implementation-related quantitative data were collected, including human and financial resources required for campaign preparation, implementation, and reporting. The campaign report of districts was collected. Data were extracted and entered in a dedicated data entry application. Quantitative data collected from the districts were exported into SPSS. Continuous data are presented as mean ± standard deviation with ranges. The economic evaluation method was used in cost-outcome description analysis, where the cost and outcome of only one intervention are assessed.

Limitations

One limitation was that we did not get the chief (highest authority) to select the participants in the study as previously planned. Selection was done by health care personnel, which may have introduced an element of bias because they selected participants they knew, who may have been more willing to use the services offered at the hospital than the general population. To address this limitation, the selection criteria (living in the village for at least 12 months, aged above 18 years, no gender restriction, involvement in community's health activities) were clearly explained to health care personnel as done in purposive sampling. That notwithstanding, we selected communities in five regions – West, Centre, Littoral, Adamawa, and South – to ensure a more representative sample of community members. Concerning the quantitative arm of the study, the main limitation was the risk of inaccurate data in district reports.

Results

A total of 259 participants were included in the study from five regions and the central level, with 98 in-depth interviews and 20 focus group discussions with 161 participants. The mean age of study participants was 45.1 ± 8.9 years, ranging from 18 to 76 years. Males represented 79.1% of participants. Table 1 provide more details on study participants characteristics.

Table 1. Characteristics of study participants

Variables	Count	Percentage
Type of participant		
Central level	**03**	**1.2**
NOCP permanent secretary	01	0.4
NGO staff	02	0.8
Regional level	**08**	**3.1**
Regional delegate	02	0.8
Focal point for NTDs in region	06	2.3
District level	**28**	**10.8**
District medical officer	08	3.0
Focal point for NTDs in region	10	3.9
President of district dialogue structure	10	3.9
Health area	**59**	**22.8**
Head of health area	20	7.7
President of health area dialogue structure	19	7.4
Community drug distributor	20	7.7
Community members*	**161**	**62.2**
Gender		
Male	205	79.1
Female	54	20.9

*Community members were involved in focus group discussions.
NGO: non-governmental organization; NOCP: National Onchocerciasis Control Program; NTDs: neglected tropical diseases.

Opportunities to Enhance Partial Integration of IVM Distribution Into PHC

Most of the participants had average to good knowledge about onchocerciasis and community-directed treatment with ivermectin as the recommended strategy against the disease. The demand and willingness to take the drug was very high in almost all regions where data were collected, with some participants asking for several treatments per year. A head of a health area reported, "We are in an area where people are in great need of Mectizan. It's a real problem […]. The CHWs [community health

workers] who work in the field also tell me that people need it." Moreover, the idea of integrating IVM distribution into the PHC system was well received by almost all participants, from communities to NGOs at the central level. An advantage reported was the opportunity to catch up those who were absent, sick, or not willing to take the drug during the campaign and later on changed their minds.

The integration was also seen as a simple and easy-to-implement approach. People were highly motivated and ready to try it. It was also described as a sustainable activity, especially if the required inputs were available and other authorities (e.g., administrative, traditional, religious) were involved in the implementation. As a participant reported: "It will last if certain parameters are ensured, i.e., the medicine must be available for the activity to be sustainable […]. The actors must be available. If they are available and accessible, it will work." This integration was also seen as an opportunity for sustainability of IVM distribution by some NGOs program managers, as funding may not be available in future years for campaigns; IVM may therefore be shared only through the PHC system.

Challenges to Address While Integrating IVM Distribution Into PHC System

The first perceived challenge identified was the strategy to manage adverse effects that may occur after the treatment. As a health area chief stated, "It [IVM integration to the primary health care system] really needs to be accompanied by measures to manage severe adverse events." The strategy suggested to address this challenge was to involve community drug distributors in follow-up after treatment as it is done during campaigns, and to provide resources for management of adverse events at health centers. However, this challenge will be rare due to the very low incidence rate of adverse events, with less than 2 cases of mild adverse events per 10,000 persons treated, and no moderate nor severe adverse events during the last campaign in July 2021.

A second perceived challenge was the increased risk of misuse of ivermectin for purposes other than treatment of onchocerciasis; IVM may be used by some people in the belief it may lead to abortion, to treat animals or for skin care, and by some health workers who might decide to sell the drug. This can be addressed by close monitoring and follow-up of the activity (a role that stakeholders at district and regional levels are willing to play as they do for other activities and for other drugs and vaccines offered in health facilities), as well as regular reporting on program data. Tools (e.g., patient registries, reporting forms, drug accountability forms) need to be adjusted to consider this new approach.

The third perceived challenge reported was the lack of motivation of community drug distributors. "There is not good coverage (during campaigns) due to the lack of motivation of CDDs [community drug distributors], if they were motivated […] the result would be very satisfactory," reported a community actor. The motivation refers to remuneration or incentives. Community drug distributors are key actors for sensitization in neglected tropical disease programs, and according to most stakeholders, they must be involved in sensitization after integrating IVM distribution into the PHC system. However, their motivation decreases over time, especially as there are no financial incentives for the activity. One approach suggested to address this was to use the same community workers for IVM distribution as those working with the insecticide-treated net campaigns or HIV/AIDS programs, for which there is remuneration.

Cost-Outcome Description of IVM Distribution Through Campaigns

The mean number of people treated during the last MDA (July-August 2021) in districts was 87,295 ± 68,902 persons, representing a mean administrative drug coverage of 81.5%. Furthermore, the total direct cost of the campaign in the district ranged from 1,249,000 CFA Francs to 8,103,200 CFA Francs, with a mean of 2,829,000 ± 1,770,342. The cost per person treated was therefore 52.9 ± 52.4 CFA Francs, with a minimum of 10.6 CFA Francs and a maximum of 228.4 CFA Francs. More details are provided in Table 2.

Table 2. Resources required, drug coverage, and cost-effectiveness of ivermectin mass drug administration in health districts (n = 26)

Variables	Minimum	Maximum	Mean ± SD
District population size	11,864	376,283	107,169 ± 84,738
Number of CDDs required for the campaign in the district	150	900	455 ± 206
Number of person-days of work for CDDs*	1,000	7,000	3,020 ± 1,659
Number of persons treated	9,760	305,974	87,295 ± 68,902
Drug coverage (%) (Administrative)	80.1	84.9	81.5 ± 0.9
Number of people treated per person-day of work for CDDs	5	85	32.1 ± 19.9
Number of mild adverse events reported	0	60	13.6 ± 18.8
Total direct cost of campaign** (in CFA Francs)	1,249,000	8,103,200	2,829,000 ± 1,770,342
Cost per person treated (in CFA Francs)	10.6	228.4	52.9 ± 52.4

CDDs: Community drug distributors, *Number of person-days was calculated as the number sum of number of working days for each CDD; **Total direct cost is the sum of cost required for campaign planning, implementation, supervision, reporting, and adverse events management.

Deliberative Forum Summary and Outputs

After data analysis, a deliberative forum was organized with 50 people invited to attend (randomly selected from among the participants). A total of 31 participants were present, including 2 participants from the Ministry of Health, 1 from an NGO, 1 from a regional delegation, 16 from the district level, and 11 from health areas. Participants validated the results and confirmed that the conceptual framework describing the responsibilities of different actors in the integration that emerged from the study was feasible to act on (Figure 1). They were ready to get involved in this new approach. They also emphasized the need for involving local community radio for sensitization of population. The list of those who were ineligible during community-directed treatment with ivermectin (e.g., pregnant and breastfeeding women, sick people) should also be added to the list of people who were absent during an MDA campaign and should be offered IVM at a health facility post-campaign.

Conceptual framework for partial integration of IVM distribution into PHC System*

Level of intervention	Prior to integration (2 – 3 months)	During Campaigns (2 – 4 weeks)	During Integration (3 – 4 months)	After integration (2 – 4 weeks)
Central level (MoH, NGOs)	• Agreement with partners • Advocacy for resources • Oder enough drugs • Adapt/develop tools (Registries, Absents forms, supervision forms)			Receive and compile reports from regions
Regional level	• Training District Staffs + District dialogue structure		At least one supervision in Districts and/or communities	• Receive and compile report from Districts • Return the rest of drug to Central level
District level	• Training Health area staffs + CDDs • Involvement of administrative and religious authorities		Monthly supervision in health centers and communities	• Receive and compile reports from Health areas • Return the rest of drugs to region
Health Centers	• Choose appropriate days of the week for treatment in health center		• Identify and train one or two peoples in charge of the activity • Receive patients, check names in registries, give the corresponding dosage of drug, report in registry	• Management of AEs referred to hospital • Report of activity with drug accountability • Return the rest of drugs to District
Communities	• Sensitization of the population • Involvement of traditional authorities	• Sensitization of the population • Fill-in the list untreated with their characteristics	Transfer the list of untreated to health centers	Consult CDDs in case of AE for initial assessment and referral to hospital if need be.
Challenges to address	• Information and education about integration • Tools and all stakeholders ready for implementation	• Complete list of untreated • Intensive sensitization	• Avoid misuse of drugs for other purposes	• Management of AEs • Report of activities

AEs: Adverse events, IVM: Ivermectin, MoH: Ministry of Health, NGOs: Non-governmental organizations, PHC: Primary Health Care. *Partial integration of IVM distribution into PHC System consists in adding continuous distribution of IVM in health centers to usual MDA campaigns.

Figure 1. Conceptual framework describing the responsibilities of the different levels during phases of partial integration of IVM distribution into PHC system

Promising Practices

The following promising practices emerged from the study:

1. **Length of integration:** Respondents in our study suggested a three-month window after the campaign period during which IVM should be available in the health centers for those who missed the mass drug distribution campaign. This period was suggested to encourage community members to take IVM during campaigns and to avoid negatively affecting a campaign.

2. **Motivation of people involved in the distribution chain:** It was suggested that in order for the proposed integration of IVM into the primary health care system to be successful, an incentive to motivate people to adhere to proposed changes should be considered.

3. **Traceability:** It was suggested that a system of traceability be put in place to avoid illegal uses of supplied IVM. The tracking of drugs in health facilities is done by supervision and checking of registries, usually performed by staff of health districts and a regional delegation. The same system could be applied to IVM offered in health facilities post-campaign.

4. **Engaging the community distributor:** It was suggested that using community distributors should be considered for successful integration because they know their communities best and are aware of community members who were absent during the MDA.

5. **Policy to take care of adverse events:** It was suggested that from the beginning, a clear policy should be available on how to manage adverse events while IVM is stored in the health facility.

6. **Consideration of reasons from refusal:** To ensure success it is important to assess why people refuse the drug and address their fears or concerns before the integration.

7. **Sensitization:** An important factor to consider for successful integration is sensitization. Shifting minds away from the status quo requires continuous educational talks geared toward community members.

8. **Storage:** The place where IVM will be stored after the campaign needs to be clear. Some respondents suggested pharmacies in the health facility while others thought this would lead to selling of the drugs that should be available at no cost.

Lessons Learned

1. During campaigns some community members refused to take the drugs because they have a personal conflict with the community drug distributor. This challenge of community-directed treatment with ivermectin, which relies only on the community drug distributor, would be addressed if IVM were available post-campaign in the health facility because people who missed the campaign would go directly to the hospital.

2. Some community drug distributors are unable to cover their area of distribution of IVM due to the very large geographic area they have to cover, tiredness, and lack of reimbursement of the transport fare. Community drug distributors therefore have to be motivated in order to achieve good treatment coverage.

3. Some people are not aware of the upcoming campaign so might travel during the period. The population should therefore be informed several weeks before beginning of campaign and be aware of the ongoing availability of IVM at the health facility when that is instituted.

4. Due to the fact that IVM distribution had some serious adverse events in the early campaign phases decades ago, many people are afraid of taking it despite the limited occurrence of these events nowadays. Community drug distributors and the general population should be sensitized on the little or no adverse effects observed currently, compared to before.

5. The cost of IVM distribution has been established. The wide ranges in costs are related to the population sizes of the districts. The costs can inform the integration of IVM with the primary health care system.

Implications for Policy, Practice, and Future Research

This study was the first attempt to demonstrate potential benefits and challenges of integration of ivermectin in the primary health care system in Cameroon. Results were based on data collected from

five regions in Cameroon and from community members, health care workers, and stakeholders at different levels of the health system. The data show that such integration has promise and potential for success, especially to ensure the sustainability of higher coverage levels of ivermectin across the population, leading toward the elimination of onchocerciasis. The next step is to conduct a trial assessing the impact of partial integration on drug coverage and cost-effectiveness of IVM-MDA. This study has also uncovered key components of current campaigns at the community and health system levels that need to be strengthened immediately. These include the need for more sensitization on the low rate of adverse events related to IVM in recent years, as well as sensitization of the community by providing early and accurate information about IVM-MDA to the population well before distribution.

Suggested Citation

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