

Community Health Workers' Experiences and Perspectives on Mass Drug Administration for Schistosomiasis Control in Western Kenya: The SCORE Project

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Abstract. The Schistosomiasis Consortium for Operational Research and Evaluation (SCORE) includes communitywide treatment in areas with $\geq 25\%$ prevalence of schistosomiasis along the shores of Lake Victoria using community health workers (CHWs). The CHWs are key drivers in community-owned mass drug administration (MDA) intervention programs. We explored their experiences and perceptions after initial MDA participation. Unstructured open-ended group discussions were conducted after completion of MDA activities. Narratives were obtained from CHWs using a digital audio recorder during the group discussion, transcribed verbatim and translated into English where applicable. Thematic decomposition of data was done using ATLAS.t.i. software. From the perspective of the CHWs, factors influencing MDA compliance included drug side effects, food supply stability, and conspiracy theories about the “real” purpose of treatment. The interest of CHWs to serve as community drug distributors stemmed from both intrinsic and extrinsic factors. Feedback from CHWs can promote more effective MDA in rural Kenyan communities.

INTRODUCTION

Schistosomiasis exhibits a focal distribution and the symptoms are often difficult to recognize, both by the infected individuals and by the health personnel who staff the primary health care facilities in rural Africa. Drug treatment is beneficial in the early stages of schistosomiasis, when only mild symptoms are present, to avoid serious debilitating consequences later in life. However, the supply of praziquantel has been a major challenge for developing countries. Even when available, the drugs are held in central medical stores and distributed to district health units, but they are often not accessed by those most in need. Current strategies are therefore geared toward mass drug administration (MDA) delivered to at-risk populations.¹

The recommended strategy for helminth control is a population-based approach in which individuals in targeted communities are treated regardless of their infection status in areas where helminth infection is prevalent. This strategy is justified for several reasons, including the simplicity and safety of delivering treatment when individual diagnosis is difficult and expensive.² The MDA for helminth control involves the distribution of drugs to the entire population of a given administrative setting (state, region, province, district, location, village, school, etc.). However, depending on the treatment, exclusion criteria may apply for part of the population. For example, ivermectin and albendazole are not recommended for pregnant women, small children are historically excluded from MDAs with ivermectin or praziquantel, and praziquantel is not recommended for distributing to persons with a history of seizure activity. MDA entails close collaboration between the organization responsible for drug distribution, usually the Ministry of Health (MOH), and target communities. The MDA is a public health intervention that can be implemented through a number of different approaches: house-to-house administration (mobile teams); booth distribution (fixed teams); administering drugs in special population groups; and distri-

bution in areas of community gathering.³ Annual MDA with safe oral anthelmintic drugs (ivermectin, albendazole, and praziquantel) is the current strategy for control of onchocerciasis, lymphatic filariasis, and schistosomiasis.⁴

Currently, programs to control morbidity related with infections of soil-transmitted helminths (STHs) and schistosomiasis depend largely on the delivery of anthelmintic drugs to primary schoolchildren because school-based deworming is advocated as a highly cost-effective public health intervention. However, a drawback of the school-based approach is that it does not reach children not attending school and other members of the community. Although some school-based programs have extended their treatment coverage to reach out-of-school children, a significant number of school-age children are still not treated, particularly older children and those living far from schools.⁵ For that reason, evidence is needed for an intervention approach that enables all children and other risk groups to benefit from treatment to control morbidity and reduce transmission. The community-directed treatment approach has shown good results in the control of onchocerciasis and lymphatic filariasis with respect to treatment coverage using community drug distributors (CDD).^{6,7} However, there are few studies that explore the experiences and perspectives of CDDs on praziquantel MDA for schistosomiasis.

Communitywide treatment programs are currently being established in Kenya by several partners. In this study, we discuss their experiences and perceptions after participating for the first time in an MDA program in western Kenya.

STUDY DESIGN AND METHODS

Study area. The study area included 75 villages that are located within 5 km of the shore of Lake Victoria in eight districts in western Kenya, including Kisumu East (4 villages), Kisumu West (2 villages), Kisumu Municipality (2 villages), Homabay (6 villages), Rachuonyo North (21 villages), Rarieda (22 villages), Nyakach (3 villages), and Bondo (15 villages) districts. All the study villages had a schistosomiasis prevalence of $> 25\%$ as part of the study inclusion criteria. The communities are rural and are mostly involved in subsistence farming and fishing activities.

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Selection and training of community health workers. In collaboration with the Kenya Ministry of Public Health and Sanitation in the participating study districts, existing primary health care infrastructure was used to recruit community health workers (CHWs) as drug distributors. The CHWs were then trained by the District Health Management Team (DHMT) members. The training covered an introduction to schistosomiasis (bilharzia) which included; physiopathology, symptoms, diagnosis, complications, prevention, and treatment. The CHWs were also taught about praziquantel, including possible adverse drug reactions, how to manage or refer side effects, eligibility for the drug (> 5 years of age), and criteria for ineligibility. Finally, they were instructed on how to perform a census, how to administer praziquantel using the World Health Organization (WHO) dosing pole, and methods for reporting drug administration coverage.

Data collection methods, processing, and analysis. The cross-sectional qualitative data collection was done between May and June 2011. Unstructured open-ended group discussions with CHWs were conducted in each district after completion of the MDA. Three unstructured *aide memoirs* designed to promote open-ended responses were provided to stimulate the discussions.^{8–10} The following *aide memoirs* were asked during the discussion: what were the CHW's experiences during the MDA, what were the challenges faced in the process of drug delivery, what were the CHW's impressions of the MDA, and what were the perspectives of other community members. In addition to the general areas covered, the specific discussion direction was guided by how people responded to the *aide memoirs*, rather than by set questions.

Descriptive statistics were calculated for participant demographic variables, amount of experience, and selection criteria to be a CDD. The narratives during the group discussions were recorded using a digital audio recorder, transcribed verbatim in the native language of the study site of the participants (Dholuo), translated into English where applicable, and then verified for accuracy by another research assistant fluent in both Dholuo and English. Transcripts were then imported into ATLAS t.i. qualitative data analysis (Berlin, Germany) software for analysis.

The current study reflects a thematic description using the principle of interpretative phenomenological analysis (IPA).^{11,12} The goal of IPA is to explore insiders' opinions and beliefs related to their experience of a particular phenomenon.¹³ Using this strategy, themes are considered to be direct representations of the phenomenon under study.¹⁴ Such an approach gives an opportunity to explore social cognition and assumes that one's interpretations of his or her experiences reflect the true nature of the phenomena, which in this case are the experiences and perspectives of the CHWs on the praziquantel MDA during communitywide treatment. Guided by this approach, coding for identified themes was done using a three phase coding system.¹⁵ During the first phase of coding, the primary researchers performed an initial scan of the transcripts that were imported into ATLAS t.i. qualitative analysis software, for the purpose of familiarization, highlighting words or phrases used by the participants, and establishing initial themes. Members of the research team identified the core themes through a process of collaborative analysis and linked the core themes to the aims of the study. In the second phase, the researchers focused on connecting themes and finding links in the data. In the final phase, the

primary researcher reread the data and assigned excerpts that illustrate the final themes. Narrative text was applied around the themes, with quotes used to illustrate the text and communicate its meaning to the reader. Decision trails were documented to guarantee that interpretations were supported by the data.¹¹

Ethical approval. The study was reviewed and approved by the Scientific and Ethical Review Committees of the Kenya Medical Research Institute and the Institutional Review Board of the Centers for Disease Control and Prevention.

FINDINGS

Characteristics of the CHWs. The CHWs were described by socio-demographic, socio-economic characteristics, and by amount of experience as a CHW. A total of 75 CHWs worked as CDDs. However, only 65 CHWs were interviewed from the eight districts because some could not be reached after the MDA exercise. Of the 65 interviewed, 38% ($N = 25$) were males and 62% ($N = 40$) were females. The median age of CHWs was 38 years, range 22–64 years; 79% ($N = 51$) of the interviewed CHWs were married, whereas 5% ($N = 3$) of CHWs never married. All the CHWs attained some level of education; 75%, ($N = 49$) attained secondary education, 15% ($N = 10$) attained primary, and 9% ($N = 6$) had attained post-secondary education (Table 1). In terms of occupation, 71% ($N = 46$) of the CHWs were self-used (involved in small business), 23% ($N = 15$) were sustenance farmers, and only 4% ($N = 2$) had formal employment (nursery school teachers). Currently, the government does not provide any form of payment for the CHWs. There is a proposal for the CHWs to be paid 2,000 Kenyan Shillings (~23 USD) per month but this is yet to be implemented by the Ministry of Public Health and Sanitation (District Medical Officer of Health, personal communication).

Most of the CHWs (74%, $N = 48$) had over 2 years of experience working as CHWs; the amount of experience ranged from 6 months to 21 years. All had both been trained by the Ministry of Public Health and Sanitation or other

TABLE 1
Socio-demographic characteristics of community health workers (CHWs) and community drug distributors (CDDs)

Characteristic	Frequency ($N = 65$)	Percentage (%)
1. Sex		
Female	40	62
Male	25	38
2. Age in years		
20–24	3	5
25–29	5	8
30–34	10	15
35–39	20	31
40–44	16	25
45–49	5	8
50–54	4	6
60–64	2	3
3. Educational level		
Primary education*	10	15
Secondary education*	49	75
Post secondary education	6	9
4. Level of experience in years		
6 months–2 years	17	26
> 2–5 years	35	54
> 5 years	13	20

*Attended primary or secondary education even if the level was not completed.

non-governmental organizations and had worked for at least one of these organizations as well. Most (59%, $N = 38$) became CHWs after being selected by the community and became CDDs in the schistosomiasis control program after being selected by the Ministry of Public Health and Sanitation. Some (16%, $N = 10$) were selected by the area Assistant Chief or Chief to be a CHW and also to be a CDD in the program in those areas where community health structures were not well established.

Drug distribution approach and perspectives. All the CHWs who worked in the program as CDDs were well established and vested in their community and like any other community member, were equally affected by the day-to-day problems in the community. These individuals are driven by the desire to serve their community, which includes their own children. This commitment was clear during the group discussion:

"I started the job from my house, I was the one who first took the drug with my children until one of my children really diarrhead (had a serious bout of diarrhea) but s/he got fine to an extent s/he took a hoe and went to the garden." (35 year old widow CHW, Rachuonyo)

All the CHWs indicated that they distributed the drug on a house-to-house basis. For easy tracking of household-level treatment coverage, community members were not assembled in central places for treatment. In some instances, the CHWs followed the persons wherever they were, for example in the "garden," which refers to the farming plot that most households rely on for subsistence food. A person's garden is not necessarily proximate to their household.

"...you can go to someone's house like even five times in a day and you find that they have gone to the garden. It forces you even to go to them even in the garden. Someone also tells you that I should help them finish a certain portion of the garden when I give them the drug." (37 year old married female CHW, Kisumu West)

The CHWs also indicated that they followed their training guidelines, supervised, and observed the treatments to ensure drug compliance.

"... I also want to give the drug so that when s/he vomits it out, I give him/her another dose till it goes into his/her stomach." (49 year old married male CHW, Nyakach)

Themes related to an unstable food supply and the subjective experience of the drug side effects were also mentioned by the CHWs as a major challenge during the MDA process. Many community members refused to take the drug on the grounds that the side effects were very bad. Because the drug could not be taken on an empty stomach, the issue of hunger was also raised as a major challenge to MDA compliance. "Tea" refers to a light meal.

"...people are really complaining that it is a period of hunger. During this period (hunger) they (community members) don't need the drug, they come from the garden when they are tired and they only eat at night. It's only in the morning that they get tea (light meal) even if its porridge and then go to the garden thereafter." (30 year old married female CHW, Rarieda)

"...the challenge that I faced when I was moving was that I started giving out the medication the first day, second day, and third day, those who had taken the drugs started spreading rumors that if you take the drug you diarrhead, you vomit." (23 year old married female CHW, Rarieda)

However, the community members suggested to the CHWs that in the future, the communitywide MDA should be car-

ried out during the harvesting season when there is an adequate food supply.

"...they (community members) are telling us (CHWs) that we should bring the medication during the harvesting season when there is something to eat." (42 year old widowed female CHW, Rarieda)

A "wait and see attitude" was also used by some of the community members to see what would happen to others who took the medication first. After making their own empirical observations of the benefits of treatment and realizing that those who took the medication had an immediate improvement in health, they then demanded the drug. However, this often happened after the stipulated period for drug distribution had finished.

"...there were those who always followed me so that I could give them the drug because those who had the swellings, when they became okay, they became very fine. Now someone comes to you and tells you, 'I also want to be given that drug.'" (53 year old married female CHW, Kisumu East)

Almost everyone who was given the drug complied. Reasons for non-compliance included rumors that they heard about the drug.

"...others refused because of the propaganda and rumors that was on-going round and again to me in my village, that this drug creates cancer. So it was very very difficult for us to convince people that the drug for your organization is not mulgated with cancer (contains a cancerous substance)." (26 year old single male CHW, Homabay)

In some cases, the CHWs indicated that others refused to take the drug for reasons such as their religious affiliation, suspicion that the drugs were anti-retroviral drugs, or that it was a government conspiracy to decimate the ethnic communities in that region, related to some level of mistrust toward the government.

"...some people were saying that I am giving out drugs for HIV/AIDS. They thought that the drugs were for HIV/AIDS." (38 year old married female CHW, Rarieda District)

"...some people were trying to complain that the bags we (CHWs) were given belonged to the government, 'could it be that the government brought for us the drug that will kill us?' and I told them that, 'no, the government cannot kill her people.'" (34 year old married female CHW, Nyakach District)

However, those that did not take the drug for religious reasons did allow their children to be treated:

"...those that their religion doesn't allow them to take any medication, but if you went to their houses s/he will tell you that, 'I cannot take the drug but you can just give my children.' Hence we were just giving it to the children." (35 year old married female CHW, Rachuonyo District)

The timing of the MDA was also a major challenge experienced by the CHWs because the activity took place at the time when most of the community members were mainly occupied tending their sustenance farming plots; thus, it was often not easy to find them at home.

"... We (CHWs) also had a difficult job because it was that time that people were weeding in their gardens, you could go to someone's house for around three times and you find that they are not there, you come back again." (27 year old married male CHW, Rarieda)

The community members also questioned the use of the tablet pole to determine the dosage that was to be given to them. Others would not take the drug because they did not

understand the concept of mass treatment when they had not been tested for the infections.

“...you just come in like this, and s/he starts, ‘I have malaria.’ Now s/he wants you to give him/her malarial drugs, and s/he wants this drug as well. S/he has taken you as a doctor, now it is this thing (tablet pole) we were using to measure the height that will start to bother him/her, ‘aah mother, I think that when you have malaria there is something that the doctor does, that thing (tablet pole) you are touching, will it do what it is supposed to do?’” (38 year old married female CHW, Kisumu West)

“...there was also some people telling me that, ‘with me I cannot take the drug before being tested because how will you know that I have bilharzia (schistosomiasis)?’” (53 year old married female CHW, Kisumu Municipality)

Generally, the community members were appreciative of the collaborative efforts between Kenya Medical Research Institute (KEMRI) and SCORE to control schistosomiasis in their respective areas, especially those who took the drug and had health improvements.

“...the majority were very glad with the efforts which KEMRI made as far as collection of the samples that eventually brought the drugs. They encouraged the program so that the high prevalence of bilharzia along the lake region can depreciate (be reduced).” (26 year old single male CHW, Homabay)

“... I am saying that this drug has really done a lot and big things to people of village Z. It seemed that people of Village Z had not known the goodness of this drug. Some people took the drug and seriously diarrhead and vomited, but after diarrhea and vomiting they would come to me telling me that this drug is good that I should give it to them so that they go and keep it in the house. But I told them that we are not allowed to give you this drug to keep in the house that it will be brought again, and they tell you that, ‘then go and ask those people when are they bringing it again, because we are now very okay and we now feel quite better more that we were before.’” (38 year old married male, Nyakach CHW)

Sensitization process, selection of CHWs, awareness of the drug delivery, and gender roles. After the CHW training, some of the CHWs sensitized their community members. In situations where the sensitization was very effective with active mobilization of the community members, they were very supportive of the activity. In contrast, those who were not aware of the exercise demanded an explanation before taking the drug. The provincial administration was also very supportive of the exercise in some villages.

“... I am an Seventh Day Adventist, and I did something like a teaching, and in the evening like at around seven, people were very many at my door step they needed the medicine. When I looked into the books (census books), all these people’s names were not there because all of them were coming from village X, some of them came from village Y.” (56 year old female CHW, Rarieda District)

In places where the census was carried out by different CHWs or enumerators, this caused confusion for the drug distributors. Where it was done appropriately, the census served as an added layer of sensitization and helped the drug administration.

“... I found a certain challenge, you can go to somebody’s compound and he is telling you that he is not aware of what is going on but his name is in the book and if you ask the wife she

tells you that she has not seen such a person. But all in all, it seems whenever they went to a given home and even found the children while the parents are not there they would just ask those children their parents’ name because it was a must that the census had to be done, so it was forcing me to explain to them what had brought me and what I am going to do.” (60 year old married male CHW, Rachuonyo North)

“...when I left with the village elder, the village elder really helped me. I also found the enumerator had really opened all the ways for me to an extent [that] if [I] entered any house, I found the household members already knew about the drug that I was going to give.” (35 year old married female CHW, Rachuonyo)

“...the joy that I had, at first I gave out those things we were given, those papers (brochures). Now those that who had not taken the drug and if they read the papers, they come to me that they want the drug.” (50 year old married female CHW, Kisumu East)

However, CHWs felt that sensitization should be intensified, because some community members in some areas refused to take the medication on the grounds that they were not aware of the MDA.

“...they (community members) were saying there was not any news even from the newspaper or from the radio, the medias that this treatment was going to take place. So we just popped in without them knowing that these exercise was going to take what, take place. So I think next time this exercise is going to take place, information should be considered first. So the community should be aware that the exercise is going to take what? Take place, because some people you cannot convince.” (32 year old married male CHW, Homabay)

Almost half of the CHWs who worked as CDDs were married women 47.7% ($N = 31$) and some of them experienced the challenge of balancing their expected family responsibilities and the duties of drug distribution. A few of them were either physically or mentally abused by their husbands for coming home late after distributing drugs. The door-to-door method of drug distribution sometimes necessitated evening visits to include workers who were absent from their homes most of the day. Several indicated that they had had to justify to their husbands that their work as CDD was profitable (i.e., that they would eventually be paid) to avoid being abused.

“... It was not easy finding people in the morning because they had gone to the garden so it forced us to walk at night, hence we are requesting you to check on that. Like me (CHW) there is a day I came back very late. I came back at home like at around nine o’clock at night and I received slaps, but that didn’t make me leave my work (laughter).” (38 year old married female CHW, Rarieda)

“...you know you have to show the old man (husband) that this job is not just a waste of time, not that every day you go out and there is nothing that he is seeing, because if he becomes annoyed and chases you away you won’t go Bilharzia people (you will not go and live with the organization that is conducting bilharzia treatment).” (38 year old married female CHW, Kisumu East)

The perceived relationship between CHWs and the targeted groups. A number of CHWs indicated that those who were selected to do the census and sample collection were sabotaging them because they thought that they were the ones who were supposed to be providing the drug treatment.

“...on the day that I was going to work there, I called the boy who worked there and I told him that I was going to work there. Now on the first day he lied to me that he will come and point out for me those homesteads that he walked and he didn't come. Second day he came while I was winding down my job, I told him what was happening and how it should be. I told him we agreed that we should meet the following day but I didn't see him so when I went back the following day, the things (issues) I was meeting (finding)...we (community members) were told that you should not give us the drugs, it is so and so who will come and give us the drugs.' He told people that they should not take the drugs, he is the one who is going to give the drugs.” (35 year old married male CHW, Rachuonyo North)

Some community members within the study villages were not comfortable being treated by someone they knew is not a health professional or did not have any certificate to show that they were trained on drug administration.

“...okay they know that you are not a medic, because the village you are coming from maybe. I am good in another profession not a medic and you want to administer drug they will tell you, they will question you, 'we have never seen you go to the college of medicine and how are you going to give us the drugs.' So you just convince them that we had undergone some trainings and we are equipped with enough information on how we are going to administer drugs.” (35 year old married male CHW, Homabay District)

“... Initially, as I was trained here, I was back there (went back there) and there was nothing to prove that I have enough knowledge as far as bilharzia control is concerned. That is to say, there was no certificate to prove that.” (26 year old single male CHW, Homabay District)

CHW involvement in other health activities. Because the MDA program occurred at the same time as a malaria campaign on bed net distribution, the majority of the CHWs were involved in both campaigns. Some community members pressured the CHWs to provide them with bed nets before they would agree to take praziquantel, even when they were not eligible for bed nets.

“...when we were going to this homes to give drugs, and you know we are community health workers and it us who wrote their names for treated mosquitoes nets, so someone tells you that, 'before you give me the drug, please tell me when are you bringing the net?' But because we are CHWs you have to know how to talk to them. Now I told them that, 'just take the medicine the nets will come very soon but you have to take the drug that is when I will give you the net.'” (34 year old married female CHW, Kisumu Municipality)

Side effects and their management, CHWs expectations, and perspectives. According to the CHWs, the side effects that the community members reported ranged from abdominal pain, bloody diarrhea, dizziness, body swells, fever, itchiness, and vomiting. However, side effects were short lived and those who presented with side effects felt much better afterward and often wanted to be given another dose of praziquantel.

“...it's only that the side effects that really shocked some people. That is why some people could be afraid of the drug. But when you explain to some then they understood and took the drug.” (49 year old married male CHW, Nyakach District)

“... There were some people that refused the medication completely because there were others that we gave the medication, then after some hours, some really vomited, the young children, there are those young ones that vomited, maybe half

or one hour, then some were feeling dizziness for at least one hour...but those who now know how the drug is good after the side effects really praised it, they even said that we should add them another dose.” (40 year old married male CHW, Rachuonyo District)

“...the drug side effects even though they were seen like that, some people had diarrhea, vomit, fever, itchy body that you could see after a short while...someone takes the drug today and after some days that is when s/he start feeling the body itching, even though that happened but I saw the majority very happy with the drug to an extent they came back to ask me, 'can they add us this medicine again?'” (50 year old married female CHW, Kisumu East District)

The most common method of side effect management identified by the CHWs was referral of the participants to the nearest health facility.

“...on the first day he diarrhead the whole night till in the morning. I told him, 'you will be fine.' Then I went back, the wife told me that, 'so and so really suffered at night, he didn't sleep.' And I asked her where he was, and she told me that 'he is in the house.' When I went to the house I found him on drip they were adding him water, I was really disturbed, I called you to ask 'what could I do to such a person?' But we were not getting each other properly, I then called the hospital guys who brought the van and he was taken to the hospital and he was treated and he is now doing fine.” (35 year old married female CHW, Rachuonyo District)

Some of the CHWs gave out other medications such as chlorphenamine or paracetamol as a form of management for side effects but then referred the individuals to the nearest health facility.

“...it is the reaction of those drugs that I really noticed because even at night someone came in my house and I gave him/her some pain killers that I do always sell in my house then the following day I referred him/her to the hospital, those are the things that I found.” (35 year old married male CHW, Nyakach District)

A few CHWs from villages where enumerators did not surrender census booklets experienced a challenge when distributing the drugs while carrying out a census at the same time:

“...my job was well done, it's only that I really had some difficulty because it seemed like I was doing census and at the same time I was treating, because the person who did the census, though the book that was used the day that they were giving out the books we didn't get the book, now we were given the new books that we used.” (40 year old married female CHW, Rarieda District)

“...it was very very hard because up to now I have not received the enumerating book (census book). I was just given a new book to start administering drugs. That book that was used I have not seen it up to the moment, it was very difficult for me because I was just moving helter skelterly in the village. I don't know the specific home to tackle, so I blame the CDC coordinating team for not giving me the books for administering the drugs as per those whom the enumerating was done to them.” (32 year old married male CHW, Homabay District)

Although CHWs were expected to work as volunteers, many CHWs had an expectation of extrinsic incentives such as monetary and other forms of incentives like gum boots, bicycles, or umbrellas. They were influenced by the fact that other health efforts frequently involved such rewards.

“.....what I am requesting is that, we really had a difficult task, we need something we can use on our feet. I mean bicycle and even umbrella to protect us from the sun, and something small (money).” (36 year old married female CHW, Rachuonyo District)

However, intrinsic incentives also remained a powerful driver in the MDA process. These included: community recognition, satisfaction of making a contribution to the community, pride in providing a service, knowledge gained, and positive feedback from individual community members. A key motivator for CHWs was the community's confidence in them:

“.....the reason why I agree that this drug is really good is because I now have a nice name in the village, because whenever I am walking, people are just calling me *daktari* (Doctor). Now that is the good that I am seeing.” (43 year old married male CHW, Rarieda District)

“.... I am also happy because this job that I was given by KEMRI has made me get promotion in the community.” (34 year old married female CHW, Nyakach)

DISCUSSION

This was the first ever MDA in which the CHWs participated as mass CDDs, even though many of them had been serving as CHWs for many years. Despite their lack of MDA experience, it is remarkable that the CHWs achieved a coverage rate of 75% in all communities (Mwinzi et al., unpublished data). Although using CHWs to obtain the views of the community members is indirect and may not fully represent the perspectives of the individuals receiving treatment, it should be noted that CHW involvement presents opportunities for community-based participatory program evaluation because of their unique position as a bridge between health systems, program managers, and the communities they serve. Consequently, they enable program managers to integrate feedback from communities to solve challenges that arise during implementation of intervention programs. Therefore, the perspectives from the CHWs highlight some of the key issues that should be considered in subsequent MDAs and for similar programs in other settings. We did conduct surveys of the community members' knowledge, attitudes, and practices concerning schistosomiasis before the initiation of the MDA and plan to repeat these surveys later in the treatment program to help gauge how the program affects the awareness of those directly treated.

The selection or identification of CDDs is a crucial step in any community-directed distribution of drugs.¹⁶ Prior research in Uganda has shown that selection of CHWs by the community is a useful indicator for predicting and monitoring progress toward sustainability of MDA drug delivery.⁶ The CDDs have to be acceptable to the community, which calls for community involvement in their identification and selection.¹⁷ In this study, the CHWs had been selected by their community members with the facilitation of local public health officers through the existing primary health care infrastructure established by the Kenya Ministry of Public Health and Sanitation. The ministry uses the community structure in which the CHWs are selected by the community and they then become part of the Community Health Committee whose members are also selected in the Assistant Chief's community *barazas* (gatherings) under his/her guidance.¹⁸

We engaged the CHWs as CDDs with the collaboration of the health system and local administration and appreciation that the CHW had communitywide approval to participate in this role.

The participation of women as CDDs has strong merit; having both female and male CDDs will help ensure prompt, equitable, and quality health care delivery and also ensure accessibility, equity, and trust of health care services, as well as gender-sensitivity in the context of public health matters.^{19,20} In this study, 65% of CDDs were female, and 47% were married. Katabarwa and others⁶ observed low or non-participation of women in an MDA in Uganda and suggested that women should not only participate but should be available for appointments as CDDs. However, participation of women as CDDs presents challenges that require consideration in the design of programs that use women CDDs. There were three reports of married women CHWs who were physically or verbally abused by their husbands because their work as CDDs interfered with their domestic chores or required working late hours.

We found that refusal to take the drugs was a result of rumors and subjective experiences of side effects, religious objection, misconception from the community members, unstable food supply, conspiracy theories about the “real” purpose of treatment, and perceived relations between drug distributors and targeted groups. These findings echo the findings of a study in Uganda that showed low compliance with praziquantel MDA.²¹ In Uganda, factors such as fear and lack of health education were cited as reasons for inefficient drug distribution among communities and consequently schistosomiasis control.²¹ In our study, the participant population had concerns about other diseases that they perceived to be more life-threatening, such as malaria, and expressed the view to the CHWs that the MDA to control schistosomiasis was not as important for most of the community members in such a time of health care difficulties. This has been reported in MDA campaigns in other parts of the world as well.²² Some community members also took the drugs in the hope that this qualified them for other interventions such as bed net distribution. Thus, the health interventions presented by health ministries may not always be in line with the health priorities as perceived by community members, and inclusion of community members at the planning stages may help increase appreciation for prevalent health issues that may be unfamiliar to them.

The level of CHW experience played a role in MDA compliance. There was a general increase in compliance rate with increase in the years of experience as CHWs and being involved in other health intervention programs in the community (Mwinzi et al., unpublished data). As suggested in similar studies in Uganda and Nigeria, compliance increased when the CDDs were involved in health campaigns like insecticide-treated nets distribution, indicating the potential importance of such incentives to populations when a “non-life-threatening” disease such as schistosomiasis is targeted for intervention.^{6,23}

Although CHWs have worked as volunteers for a long time, they are increasingly requesting support in ways that enable them to effectively execute their responsibilities by being provided remuneration and other amenities like umbrellas, gum boots, or bicycles.

Based on the published literature, there is little agreement on how to motivate community-based volunteers. In a number of studies, the main argument has been that voluntarism

without motivation cannot be sustained, with recommendations of systematic use of multiple incentives based on the different contexts.²⁴ Some studies have proposed the integration of volunteers into other health and development programs as a form of motivation and sustainability.⁶ However, the idea of integration raises the question of whether multitasking as a volunteer does not make one inefficient as a result of many demands. When given too many tasks, CHWs feel overwhelmed with information or may spend adequate time in training so that they rarely practice what they have learned.²⁵ More qualitative studies are needed to understand the context in which people are volunteering. It is by understanding this context that realistic solutions to the problem of motivating volunteers can be developed.

The MDAs can be successfully conducted using CHWs as CDDs and should be accompanied by adequate health education and mobilization of the community. Although in the current study community members were sensitized through chief's *baraza* (community meetings), and through the door-to-door campaigns by the CHWs, not all people were reached. Future initiatives should look into alternative strategies like mass media to ensure entire communities are sensitized to the benefits of treatment. We are currently evaluating this strategy by use of local radio stations. However, health education needs to address local concerns and anxieties. The following questions should be answered during the sensitization: Why do some people suffer serious side effects when they take praziquantel while others do not? Why is it necessary to provide praziquantel by height and not by weight? What is the significance of taking praziquantel even when you don't feel sick? What is the point of taking the praziquantel even when re-infection is likely? How can you receive treatment when you have not been diagnosed?

Some CHWs are motivated by intrinsic factors such as the social status associated with the job (being referred to as "doctor"), recognition by the local community members, trainings and certificates. However, the title "doctor" may lead to abuse of trust from communities if CHWs provide health care services that they are not authorized or qualified to offer.

This study further confirms our previous observations that use of CDDs may be a viable strategy to consider in Kenya, alongside the ongoing school-based treatment strategy, as the national control program intensifies activities toward control of this disease.²⁶ Our observations are derived from only one round of treatment and drug distribution in this study, which is being implemented in rural communities. As there are clear socio-economic differences between rural and urban communities, a similar approach may not be as successful in urban settings. Thus, there is also a need to investigate the experiences of CHWs in large urban areas.

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