

Involvement and performance of women in community-directed treatment with ivermectin for onchocerciasis control in Rukungiri District, Uganda

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Abstract

The present study aimed: (1) to assess and improve the level of women's involvement in a strategy to control onchocerciasis by community-directed treatment with ivermectin (CDTI) in three parishes of Rukungiri District, Uganda; (2) to measure the performance of female community-directed health workers (CDHWs) in comparison with males; and (3) to identify culturally acceptable means of enhancing women's involvement in community-directed healthcare. Health education sessions were used to instruct community members to select female CDHWs in Masya Parish and to stress their potential importance in Karangara Parish; this subject was not raised in Mukono Parish. In all, 403 mature women who were randomly selected from the three parishes were interviewed as to their: (1) knowledge of the classes of people not eligible to take ivermectin; (2) knowledge and beliefs about the benefits of ivermectin; (3) participation in decision-making; and (4) attitudes on the performance of female CDHWs. For analysis, the respondees were divided into: (1) those who had or had not taken ivermectin treatment during the previous year; and (2) those who had or had not attended health education sessions. During the period when face-to-face interviews with women in randomly selected households were being carried out, participatory evaluation meetings (PEMs) were conducted in selected communities from the same parishes in order to reach a consensus on issues which could not easily be included in individual face-to-face interviews. Participant observations were also made regarding: how communities selected their CDHWs; how the CDHWs organised the distribution exercise and treated community members; and how the CDHWs kept records in order to understand issues which were deliberately hidden from the researchers during face-to-face interviews and PEMs. Significantly, the women who had been treated or health educated in Masya Parish were: (1) more knowledgeable on the groups which were not supposed to be treated; (2) aware of women's involvement in mobilisation of other community members; (3) involved in CDTI decision-making; and (4) had a better attitude towards female CDHWs' performance compared with males when compared with those from Karangara and Mukono parishes. There were no differences between the attitude of women in Karangara and Mukono parishes towards performance of female CDHWs. Face-to-face interviews and records from all parishes indicated that female CDHWs achieved as good a coverage as their male counterparts, and sometimes better, in about the same time. Health education increased the number of female CDHWs from nine to 52 in Masya Parish, from 7 to 22 in Karangara Parish and from 6 to 20 in Mukono Parish. Health education improved the attitude of women towards female CDHWs, but the actual experience of having and observing female CDHWs in action in Masya Parish had a more significant positive impact on the womenfolk, as well as on the rest of the community members, and created an impetus for more of them to become actively involved in

actual ivermectin distribution. The present authors conclude that recruiting more female CDHWs and supervisors would reduce the current male domination of the health delivery services, greatly strengthening the activities of CDTI programmes.

Keywords: community-directed, ivermectin treatment, male-dominated health delivery system, onchocerciasis control, role of kinship, women's involvement

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Introduction

Background

The participation of women in the annual community-directed treatment with ivermectin (CDTI) programme for onchocerciasis control has been a long standing concern of all the partners in the African Programme for Onchocerciasis Control (APOC). In Uganda, a knowledge, attitude and practice (KAP) study (Katararwa *et al.* 2001) revealed that CDTI did not initially promote the active involvement of women as distributors of ivermectin, despite their being major healthcare providers at family and community levels (World Bank Report 1993). It was assumed that the under-involvement of women was a result of the following factors: (1) their lower levels of general education and lack of adequate health education; (2) the resistance of men to accepting women as distributors of ivermectin and the belief of women that the distribution of medicines is men's work; (3) the women's heavy domestic workload; and (4) the distance from their homes to centres where community meetings are held.

In truth, none of the above represents an insuperable barrier to the active involvement of women in CDTI activities. However, the KAP study did reveal that many women who had married into new kinships outside their natal one tended to exercise extra caution when dealing with other women in their new kinship zone, where they had few or no true blood relatives. This state of affairs had been reinforced by the lack of community structures for resolving disputes among people who are related through marriage as opposed to those related by blood. Nevertheless, all the women did agree that, if they were to be mobilised and involved in gainful ventures, they would develop confidence and trust amongst themselves, and thus, be able to distribute ivermectin without fear or envy.

Encouragingly, male members of the community were supportive of the need for female ivermectin distributors, especially for treating pregnant women a week or more after delivery, and for treating young

children who might otherwise miss treatment because their mothers had no time to take them to the treatment centres. The active involvement of women would also ensure that women who are temporarily excluded because of pregnancy and/or lactation before a week after birth are treated when they are ready (Whitworth *et al.* 1996). In addition, female distributors would be more welcome in homes containing mostly women in those communities where distribution was from house to house (Katararwa *et al.* 2000a).

Therefore, there was a need to identify functional, women-friendly and culturally acceptable interactive processes for promoting the involvement of women in the actual distribution of ivermectin, the necessary behavioural change of the women with regard to selecting one another, and their performance in comparison with men in the distribution of ivermectin, all of which were still unknown.

Onchocerciasis (river blindness) disease

Onchocerciasis is a disease of significant public health and socio-economic importance in the tropics, especially in Africa, Central and South America, and Yemen in the Arabian peninsula (WHO 1995). Globally, approximately 123 million people live at risk of contracting the disease and approximately 18 million people are already infected. Nearly 99% of the estimated total number of cases are found in Africa. Onchocerciasis is caused by a parasitic filarial nematode worm, *Onchocerca volvulus*. It is transmitted from person to person by the bites of the female black fly (genus *Simulium*). These flies breed in fast-running rivers and streams. In humans, the adult female and male worms live in palpable, fibrous nodules in the subcutaneous tissues in hidden worm-bundles attached to the larger joint capsules or the periosteum of bones or in intermuscular fasciae. They produce large numbers of embryos known as microfilariae, which invade the skin and the eyes, and when they die, their released antigens can lead to severe irritating dermatitis, followed by atrophic and pigmentary changes in the skin. In the eye, they cause

lesions in the anterior segment (i.e. sclerosing keratitis and iridocyclitis) and in the posterior segment (i.e. choroïdo-retinitis, optic neuritis and atrophy), any of which can lead to severe visual impairment and eventually to blindness (Ovuga *et al.* 1995, WHO 1995). For this reason, onchocerciasis is commonly called river blindness.

Ivermectin (Mectizan®)

The drug ivermectin (trade name, Mectizan®) is a microfilaricide and a temporary microfilarial suppressant, which was approved in 1987 for mass treatment of communities exposed to onchocerciasis. A single dose is sufficient to halt the progress of the disease, especially blindness. Treatment has to be continued annually for at least 10 years in order to cover the life span of the adult worms which are not killed by this drug (Taylor *et al.* 1990). Merck and Co. (Whitehouse Station, NJ, USA), through the Mectizan Donation Programme (MDP), provides the drug free of charge for as long as necessary to all governments and organisations involved in onchocerciasis control (WHO 1995).

Community-directed treatment with ivermectin strategy

Community-directed treatment with ivermectin strategy for the control of onchocerciasis was officially launched in Uganda in 1997, after a multi-country study had demonstrated that community-designed strategies were more successful than programme-designed strategies and had greater potential for sustainability (WHO-AFRO 1996). The CDTI strategy functions well when the district health personnel first explain the purpose, principles and benefits of the programme to the community members by means of participatory health education. Once this is done, the communities are then empowered to make all the local management decisions and carry out the treatment with minimal external interference. A successful CDTI programme is one in which each community being offered ivermectin mass treatment assumes responsibility for: (1) selecting its own community-directed health workers (CDHWs), who must be members of the community, and having them trained by the district health authorities at a time and venue chosen by the community; (2) deciding whether the distribution should be from house to house or from a central location, and if the latter, choosing its location; (3) deciding how many CDHWs there should be, which sections of the community each should cover, when the distribution should take place and how the CDHWs should be supported; (4) collecting ivermectin from a central district-health delivery point not very far from

the community; (5) safe storage and distribution of the ivermectin to all people eligible to take the drug, including maintenance of a reserve for subsequent treatment of absentees and temporarily non-eligible people (e.g. pregnant women or sick persons) who could not take the drug at the time of mass treatment in the community; (6) promptly recognising rare severe adverse reactions to treatment and referring people suffering from them to local health authorities; and (7) changing the treatment approach if it is found to be unsuitable after the first round of treatment (Katarwa *et al.* 2000a).

Every community is responsible for organising its own distribution exercises. Success depends on a significant number (or a 'critical mass') of community members meeting together with their leaders to be educated and involved in onchocerciasis and its control, and then to decide on the community-directed activities to be adopted for the distribution of ivermectin. In Uganda, once a community is prepared in this way and allowed to plan and implement its own CDTI activities, it usually achieves and sustains the desired target coverage of 90% of its eligible population or ultimate treatment goal (UTG) (Katarwa *et al.* 2000b). The eligible population refers to the whole community population minus children < 5 years who are not supposed to be treated with ivermectin since it was not tested in children of this age (WHO 1995).

The aims of the present study were:

- 1 to identify factors in the existing health services which promote, support or hamper women's involvement;
- 2 to involve women in the CDTI programme as distributors;
- 3 to integrate women-friendly and culturally acceptable interactive processes into CDTI activities;
- 4 to assess and compare the performance of women with that of male distributors regarding: coverage and speed of distribution; referral of adverse reactions; and follow-up of absentees and non-eligible people;
- 5 to evaluate perceived benefits to communities as a result of women's active involvement in CDTI; and
- 6 to recommend a policy that will promote active involvement of women in the distribution of ivermectin.

Subjects and methods

Study area

The present study was carried out in the Rukungiri District of south-western Uganda, where a total of approximately 39 000 people live in 12 parishes within

the onchocerciasis endemic areas. Using cluster sampling, three parishes, i.e. Masya, Karangara and Mukono, with a combined population of approximately 11 000 people, were selected for the assessment on the impact of women's involvement on CDTI activities. Only the first two of these parishes had been involved in the previous KAP study (Katarbarwa *et al.* 2001).

The three parishes were located at least 20 km from each other, thus effectively preventing inter-parish communication while the assessment of women's involvement in CDTI was being carried out. During health education at kinship level in Masya Parish, community members were told to select female ivermectin distributors; in Karangara Parish, they were told of the importance of having women as ivermectin distributors, but were not instructed to select them; and in Mukono parish, the issue of involving women in CDTI and later on selecting them as ivermectin distributors was not raised. Health education that instructed community members to select female CDHWs in Masya Parish had been discussed during the KAP study by community members, and it was agreed that the selection of female CDHWs was beneficial and should be done (Katarbarwa *et al.* 2001). Therefore, instructing community members to select female CDHWs was intended to test what they had agreed upon and was within the confines of the community-directed intervention strategy.

In all three parishes, district health personnel, mainly from health units close to the communities, facilitated health education sessions at the kinship level. The successful performance of each CDHW was based on the achievement of 90% or more of her or his UTG within a week. Any CDHW who did not achieve this level was considered as having been unsuccessful.

Face-to-face interviews with women in households

In all of the 31 communities studied, face-to-face interviews with women using semi-structured questionnaires were carried out. Lists of mature women (mostly married), one from each household in each community, were made. From these lists, the women from 403 households were randomly selected (13 from each of the 31 communities) for face-to-face interviews. The numbers of women interviewed were: 143 in Karangara Parish (with 11 communities and 35 kinship zones); 117 in Masya Parish (with nine communities and 33 kinship zones); and 143 in Mukono Parish (with 11 communities and 38 kinship zones). In each community, the first household was selected with the assistance of a random number table (Kuzma 1992), after which the next 12 households were selected by taking every fifth household in each list. For a study area whose population is homogeneous with about 39 000 people, interviews for 245 randomly

selected women from households are needed. This is estimated to give a sampling error of $\pm 5\%$ at the 95% confidence level (Salant & Dillman 1994). Prior to random sampling, the questionnaires had been tested in another parish and district where the study was not involved in order to improve their appropriateness, reliability and validity. The interviewers who had a minimum of secondary education and spoke the same language as the people of the study area were trained to interview a sample of randomly selected women. During the interviews, the researchers were always in the area in order to attend to problems which might be faced by the interviewers. Each interviewer was supposed to interview 13 women within 2 days. An extra day was given to those who could not complete the interview within the given period.

The researchers checked each question and where there was a problem, the interviewer provided some explanation or was given more time to go back and verify the responses with the particular respondent.

Each interviewee was questioned on:

- 1 her attendance at health education sessions;
- 2 whether she had taken ivermectin during the previous year's distribution;
- 3 her knowledge of the classes of people not eligible to take ivermectin;
- 4 her knowledge and beliefs about the effects of ivermectin treatment;
- 5 her involvement in the CDTI decision-making processes (i.e. the location of treatment centres and the period of treatment) and in the selection of CDHWs; and
- 6 her attitude towards the comparative performance of female and male ivermectin distributors.

Face-to-face interviews with community-directed health workers

Tested questionnaires were also administered to all the CDHWs (distributors of ivermectin) in each community according to kinship zones. The main issues dealt with were: (1) the sex of the distributor; (2) the percentage coverage of her or his UTG that was achieved (the UTG for each CDHW being the number of people eligible to take ivermectin among those allotted to the CDHW for treatment); and (3) the number of days taken by each CDHW to complete the distribution of ivermectin.

Participatory evaluation meetings

During the period when face-to-face interviews of women in randomly selected households were being carried out, participatory evaluation meetings (PEMs) were also taking place in selected communities in the

same parishes. Eight PEMs were conducted, three in Masya Parish, three in Karangara Parish and two in Mukono Parish, and both men and women attended the PEMs. The number of people in attendance ranged from 38 to 114, and the women attendees outnumbered the men in most meetings. The selected communities had been involved in setting the day, time and place of the PEM (Katarbarwa *et al.* 2000a). Each PEM was guided by a facilitator, assisted by at least four people (i.e. research assistants, health workers and community members), who recorded the community responses. The issues dealt with in the PEM were: (1) knowledge of and attitudes to women's involvement; (2) the involvement of women in the CDTI decision-making process; and (3) socio-cultural structures and processes which enhance or hinder women's involvement in CDTI. The importance of participatory evaluation meetings was to reach a consensus on issues which could not easily be included in individual face-to-face interviews.

Participant observation

The researchers also employed the method of participant observation: time was spent visiting, interacting with and observing what was happening among community members (Haviland 1997), especially in Masya and Karangara parishes. Observations were made regarding how communities selected their CDHW, how the CDHWs organised the distribution exercise, and how they were involved in treating community members and kept records. The researchers visited the study area regularly at every stage of the study and during the implementation of community-directed treatment with ivermectin activities. Participant observation was done from June 2000 to March 2001. During visits in the communities, the researchers interacted with community members (both women and men), female and male CDHWs, community leaders, as well as health workers. The researchers listened, observed and asked questions in order to find out the following: (1) the selection of female CDHWs; (2) their performance as viewed by other community members; (3) the problems which they faced; (4) how the CDHW or communities had organised the ivermectin distribution exercise (e.g. how they allocated the households to treat, and the proximity of the allocated households to the female or male CDHW homesteads); (5) record keeping; and (6) the management of rare side-effects. Participant observation helped in understanding issues which were deliberately hidden from the researchers during face-to-face interviews and PEMs. Nevertheless, these observations could provide explanations on why some CDHWs succeeded while others failed or faced many problems during the course of carrying out CDTI activities.

Data analysis

The women interviewees in the three parishes were divided into: (1) those who had been treated with ivermectin during the previous year and those who had not; and (2) those who had attended health-education sessions and those who had not. Using the chi-square test for statistical significance (with Yates' correction, where appropriate), the differences in the numbers of women in each group answering satisfactorily 'Yes' or 'No' to questions on the following topics were compared as regards: (1) their knowledge of the classes of people who are not eligible to take treatment with ivermectin; (2) their knowledge and beliefs about the effects of ivermectin; (3) their involvement in CDTI decision-making in the selection of CDHWs; (4) their knowledge of women's involvement in mobilising community members; and (5) their views or attitudes on the relative performances of female and male CDHWs. During analysis, as regards attitudes, strongly agree and agree meant 'yes' while strongly disagree and disagree meant 'no'. For easy analysis, quantitative data was checked, coded, entered into the computer and analysed using the EPI-INFO computer program (Melissa & Miner 1997).

Results

Table 1 shows the numbers and percentages of women interviewees who had been treated with ivermectin in the previous year, and the numbers and percentages who had attended health education sessions, for each of the three parishes in the study. (Explicit *P*-values are given where possible to allow the comparison against a Bonferroni-corrected significance level of $P = 0.05/3$, as there are three pairwise comparisons for each item.)

The percentages of interviewees who had been treated with ivermectin were appreciably higher in Masya Parish and Karangara Parish than in Mukono Parish. There was no statistically significant difference between Masya and Karangara parishes, but the difference between each of these and Mukono Parish was highly significant. In Masya Parish, where health education and active involvement of women in CDTI activities was the strategy, all of the women interviewees had attended health education sessions. In Karangara Parish, where the importance of having women as in CDTI and selecting them as ivermectin distributors was raised, almost 92% of interviewees had attended the sessions. In Mukono Parish, where the issues were not raised, only 70% of interviewees had attended sessions. The differences between all pairs of parishes were statistically significant.

Table 2 shows the responses to questions, broken down again by parish. For almost all questions, the

Table 1 Treatment with ivermectin and attendance at health education sessions by parish

Variable	(1) Masya		(2) Karangara		(3) Mukono		Level of significance			
	Yes	No	Yes	No	Yes	No	Total	1 & 2	1 & 3	2 & 3
Treatment with ivermectin during previous year	108 (93.1%)	8 (6.9%)	127 (90.1%)	14 (9.9%)	101 (71.6%)	40 (28.4%)	141	NS	$P < 0.001$	$P < 0.001$
Attended health education sessions previous year	116 (100%)	0	131 (91.6%)	12 (8.4%)	100 (70.4%)	42 (29.6%)	143	$P < 0.004$	$P < 0.001$	$P < 0.001$

NS, not significant.

percentage of positive responses was highest for Masya Parish and lowest for Mukono Parish.

The women interviewees from Masya Parish were more knowledgeable than women from Karangara Parish or Mukono Parish on the groups who were not supposed to be treated. Differences between Masya Parish and Karangara Parish were statistically significant apart from responses towards treatment of the bed ridden (89% of women from Masya Parish and 82% of women from Karangara Parish agreed or strongly agreed that the bedridden should not be treated). Differences between Masya Parish and Mukono Parish were significant for all three questions. Women from Karangara Parish and Mukono Parish only differed significantly in their response towards treatment of the bedridden (only 56% of women from Mukono Parish agreed or strongly agreed that the bedridden should not be treated).

Women from Masya Parish were generally more knowledgeable on the benefits of taking ivermectin than women from Karangara Parish and Mukono Parish. In terms of making one feel good, preventing blindness and de-worming, differences between Masya Parish and each of the other two parishes were highly significant, while Karangara Parish and Mukono Parish only differed significantly in attitudes towards the prevention of blindness. The only question in which women from Masya Parish showed fewer positive responses than women from the other parishes concerned the stopping of itchiness: only 22% of women from Masya Parish agreed or strongly agreed with the statement, compared with 39% from Karangara Parish and 29% from Mukono Parish. However, only the difference between Masya Parish and Karangara Parish was statistically significant.

The participation of women in decision-making in community-directed treatment with ivermectin was highest in Masya Parish, and lowest in Mukono Parish. Differences between Masya Parish and Karangara Parish were not significant (allowing for a Bonferroni correction to the significance level), but differences between each of these parishes and Mukono Parish were highly significant.

Women from Masya Parish were more aware of women's involvement in mobilisation of other community members than those from Karangara Parish, who were more aware in turn than those from Mukono Parish. The difference between each pair of parishes was statistically significant.

Women from Masya Parish had a better attitude towards female CDHWs than those from the other parishes. Differences between Masya Parish and each of Karangara Parish and Mukono Parish were highly significant, whereas there were no significant differences between Karangara Parish and Mukono Parish.

Table 2 Responses by parish from female interviewees who had or had not been treated with ivermectin during the previous year regarding their knowledge, beliefs and attitudes to matters related to community-directed treatment with ivermectin (CDTI) and community-directed health workers (CDHWs)

Variable	(1) Masya (n = 116, 93.1%)			(2) Karangara (n = 141, 90%)			(3) Mukono (n = 141, 71.6%)			Level of significance		
	Yes	No	Total	Yes	No	Total	Yes	No	Total	1 & 2	1 & 3	2 & 3
<i>Knowledge of women of groups not to be treated</i>												
Children < 5 years and < 90 cm	116 (100%)	0	116	133 (93.0%)	10 (7.0%)	143	126 (90.0%)	14 (10.0%)	140	P = 0.010	P = 0.001	NS
Bedridden	103 (88.8%)	13 (11.2%)	116	116 (82.3%)	25 (17.7%)	141	79 (56.4%)	61 (43.6%)	140	NS	P < 0.001	P < 0.001
Lactating mothers one week after delivery	109 (94.0%)	7 (6.0%)	116	100 (70.9%)	41 (29.1%)	141	107 (76.4%)	33 (23.6%)	140	P < 0.001	P < 0.001	NS
<i>Knowledge of women about the benefits of taking ivermectin</i>												
Stops itchiness	26 (22.4%)	90 (77.6%)	116	55 (39.3%)	85 (60.7%)	140	41 (29.3%)	99 (70.7%)	140	P = 0.006	NS	NS
Makes one feel good	45 (38.8%)	71 (61.2%)	116	14 (10.0%)	126 (90.0%)	140	26 (18.4%)	115 (81.6%)	141	P < 0.001	P < 0.001	NS
Prevents blindness	114 (98.3%)	2 (1.7%)	116	121 (86.4%)	19 (13.6%)	140	99 (70.2%)	42 (29.8%)	141	P = 0.001	P < 0.001	P = 0.002
De-worms	106 (91.4%)	10 (8.6%)	116	94 (67.1%)	46 (32.9%)	140	91 (64.5%)	50 (35.5%)	141	P < 0.001	P < 0.001	NS
<i>Involvement of women in CDTI decision-making</i>												
Participated in choosing time of distribution	109 (94.0%)	7 (6.0%)	116	119 (85.6%)	20 (14.4%)	139	77 (55.8%)	61 (44.2%)	138	NS	P < 0.001	P < 0.001
Participated in selecting the venue for ivermectin treatment	109 (94.0%)	7 (6.0%)	116	123 (87.2%)	18 (12.8%)	141	83 (59.7%)	56 (40.3%)	139	NS	P < 0.001	P < 0.001
Participated in selecting CDHWs	111 (95.7%)	5 (4.3%)	116	124 (87.9%)	17 (12.1%)	141	70 (50.4%)	69 (49.6%)	139	P = 0.047	P < 0.001	P < 0.001
Know about women's involvement in the mobilisation of other community members	116 (100%)	0	116	128 (90.8%)	13 (9.2%)	141	110 (79.1%)	29 (20.9%)	139	P = 0.002	P < 0.001	P = 0.010
<i>Attitudes of women on female versus male CDHW performance</i>												
Female CDHWs are better distributors than male CDHWs	92 (90.2%)	10 (9.8%)	102	91 (66.4%)	46 (33.6%)	137	68 (60.2%)	45 (39.8%)	113	P < 0.001	P < 0.001	NS
Appreciate the performance of female CDHWs	99 (86.8%)	15 (13.2%)	114	100 (71.9%)	39 (28.1%)	139	89 (69.0%)	40 (31.0%)	129	P = 0.006	P = 0.002	NS
Female CDHWs should continue during next distribution	113 (98.3%)	2 (1.7%)	115	101 (72.1%)	39 (27.9%)	140	99 (75.0%)	33 (25.0%)	132	P < 0.001	P < 0.001	NS

NS, not significant.

Recruitment of additional female community-directed health workers as a result of health education sessions

Table 3 shows the numbers of male and female CDHWs in each parish before and after the current health-education campaign.

After the health education campaign, all 52 female distributors in Masya Parish had been selected by community members from their kinship zones, and therefore, were true CDHWs (Katabarwa & Richards 2001), rather than community-based health workers appointed by their local council members. The corresponding numbers of female ivermectin distributors who were selected by community members in the other two parishes were 18 out of 22 for Karangara (82%) and 19 out of 20 for Mukono (95%). The health education campaign in Masya Parish, which instructed the people to recruit more female CDHWs, resulted in an increase of 43 more women (up by 478%); in Karangara Parish, where the desirability of recruiting women was merely emphasised, the campaign resulted in an increase of 15 more women (up 214%); and in Mukono Parish, where the health-education campaign did not focus on the issue of women but where the questionnaires drew attention to them as a group, there was an increase of 14 more women (up 233%).

Relative performances of male and female community-directed health workers

Table 3 also shows a comparison of the performances of male and female CDHWs in the three parishes during

the annual ivermectin distribution round after the health-education campaign. It compares the means (and ranges) of the numbers of days taken to complete their distribution, the numbers (and percentages) achieving 90% or more of their annual treatment objective, and the numbers and percentages achieving at least 90% of their annual treatment objective within 7 days. There was no significant difference between the performance of the males and the females. Although most female CDHWs lacked previous experience, they performed as well as their menfolk and sometimes even better during ivermectin distribution.

Results from participatory evaluation meetings/participant observation

Participatory evaluation meetings were well attended by women in all three parishes. Out of the eight PEMs held, women outnumbered men in five of them and they participated actively in the discussions. The women of Masya Parish were more confident than their counterparts in Karangara and Mukono parishes, a fact attributed to the experience that they had gained from having been more involved in CDTI activities.

It was mentioned in the meetings and later observed that four women's drama groups had been formed in Masya Parish, one in Karangara Parish, but none in Mukono Parish. Although formed by women, these groups also had some male members and were focusing on onchocerciasis control through CDTI strategy. The actors spent their free time, mainly on Sunday afternoons, entertaining and, at the same time, educating the community members at a time when the majority

Table 3 Numbers of communities and kinship zones, numbers and percentages of male and female community-directed health workers (CDHWs) before and after health education, and the performances of male and female CDHWs towards achieving their annual treatment objectives (ATOs)

Variable	Parish		
	Masya	Karangara	Mukono
Number of communities	9	11	11
Number of kinship zones	33	35	38
Number (%) of male CDHWs:			
before health education	14 (60.9%)	17 (70.8%)	18 (75%)
after health education	26 (33.3%)	32 (59.3%)	34 (63%)
Number (%) of female CDHWs:			
before health education	9 (39.1%)	7 (29.2%)	6 (25%)
after health education	52 (66.7%)	22 (40.7%)	20 (37%)
<i>Performance of CDHWs</i>			
Mean (range) number of days to complete distribution:			
males	7 (1–37)	25 (2–85)	9 (2–14)
females	6 (1–36)	25 (2–90)	6 (2–14)
Number (%) achieving 90% or more of their ATOs:			
males	20/26 (76.9)	8/32 (25)	7/34 (20.6)
females	37/52 (71.1)	4/22 (18.2)	6/20 (30)
Number (%) achieving 90% or more of their ATOs within 7 days:			
males	19/26 (73.1)	1/32 (3.1)	4/34 (11.8)
females	36/52 (69.2)	1/22 (4.5)	4/20 (20)

of the villagers were free and available to watch the performances.

It was observed that the CDHWs in all parishes, especially in Masya, divided the households amongst themselves within their respective kinship zones. Each CDHW was given a number of households that was manageable and wherein treatment could be completed within a few hours. In these favourable circumstances, both the ivermectin and the registers kept moving from one CDHW to the next within the zone.

This organisation was better implemented by female CDHWs, who tended to distribute the work amongst themselves. Where female CDHWs as a group were involved, information on defaulters and on those who were excluded from treatment was rapidly shared, record keeping was jointly done, and the community leaders were kept informed. By contrast, the male CDHWs tended to have certain dominant individuals who never wanted to share the work or shared information only when asked to do so. Often, their male colleagues would happily agree to this. Therefore, more male than female CDHWs made mistakes during recording, failed to report defaulters and pregnant women, and failed to go back to treat the latter a week after they had delivered.

Mass treatment with ivermectin in Karangara Parish took longer than in other parishes, partly because of tea growing, which is more common in this parish and keeps the residents away from their homes most of the time, unlike in other parishes where there are fewer tea fields. It was observed in Mukono Parish that mass treatment was stopped before the desired coverage was achieved. The main reason was that the CDHWs had treated everybody who was available and assumed that everybody had been treated.

Discussion

Importance of active involvement of women in all community-directed treatment with ivermectin activities

The present results show that women who had been given health education and had experience with female CDHWs during ivermectin distribution often felt that women performed better as CDHWs than did their male counterparts. Health education improved the attitude of women towards female CDHWs, but the actual experience of having and observing female CDHWs in action in their community had a more significant positive impact on the womenfolk, as well as on the rest of the community members, and created an impetus for more of them to become involved in the programme.

There was no significant difference between the performance of the males and the females and one may

conclude that female CDHWs perform overall just as well as their menfolk, and sometimes even better, despite many of them lacking any previous experience of distribution. This was especially noticeable in Masya Parish. There can be little doubt that certain parishes, or certain communities within a parish, are enthusiastic and active in promoting health projects, while others are not. However, a programme that can gain the support of the womenfolk is much more likely to succeed than one which fails in this respect. The results show that having been treated does not imply that one has knowledge about the benefits of treatment, or that one is aware of women's involvement in mobilising other community members and other CDTI activities. The treatment coverage for Masya and Karangara parishes was statistically not different, but the responses from the women from both parishes were different.

Cultural aspects

The present authors' earlier KAP study (Katarbarwa *et al.* 2001) indicated that it was the lack of close and regular interaction amongst the women that kept them suspicious of one another and unwilling to select female CDHWs. This was mainly because most of them had originally come from clans and kinships outside the resident kinship zones into which they had married. This meant that the women could not wholly trust one another, and the communities did not have any proper social structures or processes which would encourage their regular interaction, and thus, help to overcome this problem. Therefore, the question was: Why didn't the women select their kinswomen to distribute ivermectin? The reason for this was that most mature kinswomen who could handle CDTI issues had already been married outside their kinships, and hence, were not available.

The women themselves were well aware of this difficulty, and had suggested that a system whereby they could interact regularly in gainful ventures would help them to forge relationships and work together. It was interesting that, after women had begun to be selected as CDHWs, the interactions during training and actual CDTI work engendered the idea of their forming drama groups. Through these groups, the women interacted regularly and developed confidence in themselves. The present authors observed village women putting on trousers, sticking false beards on their chins and playing the role of men during drama – actions which would previously have been condemned in these communities. Interestingly, the men did not object to this, but rather enjoyed the whole spectacle. It was clear that the trousers being used were for men, an indication that they probably borrowed them from their husbands. The

women in these drama groups, many of whom had symptoms and obvious signs of onchocerciasis, were very creative. Through drama, they managed to mobilise their communities, and educate them about the disease and its control. Therefore, it is no wonder that they achieved a desired coverage within a short time. Even the male informants agreed that women were culturally better at determining which people fell within the exclusion criteria for ivermectin treatment (APOC/WHO 1998), i.e. judging the age of children as still too young or too small to be treated, finding out whether a woman was pregnant and whether she was about to give birth or still had a long time to go, and determining who was too seriously sick to receive treatment. This information enabled the female CDHWs to keep ivermectin in reserve for those whose exclusion was only temporary.

Role of kinship and traditional beliefs

In rural Uganda, kinship issues are of great importance in social relationships, property inheritance and community welfare. Community loyalties are still divided along kinship lines, rather than in accordance with political or administrative dictates, and it is through kinship structures that the social legal systems still operate. Since close kinsmen tend to live and work together within a limited area (Katabarwa *et al.* 2000b), female CDHWs, or the kinmen they have to treat, need walk only short distances (< 0.5 km) to deliver or obtain their ivermectin tablets. This is a definite advantage, making for rapid distribution and good coverage.

During the KAP study, female informants revealed that they did not like to select female CDHWs who lived close to their homesteads. Traditionally, it is believed that a healer or person from far away is better than that one close to your home. Therefore, women tended to prefer that people who handle medicines should come from further away from their homesteads. The reasons given for this were that a healer or person handling medicine close to home could use the patient's weakness against him or her, and that a healer from far away was more likely to have new solutions. This behaviour has also been observed among the Iraqw of Tanzania (Rekdal 1999) and the Tonga of Zambia (Colson 1966). The female informants in Rukungiri District also mentioned that your neighbour, although being your supporter, is also a potential enemy with whom you are likely to disagree over petty issues. If you select her as a CDHW and you subsequently have a disagreement, then she will have a chance to retaliate by poisoning or putting witchcraft upon the ivermectin, or even upon the water that is used for swallowing it. For these reasons, women tended to avoid selecting close female neighbours as CDHWs. In spite of these beliefs, the

kinship group is the place where moral and material support for male or female CDHWs is assured.

Community-directed treatment with ivermectin activities do not overburden women

It has been suggested that female CDHWs might be overburdened if they took on CDTI activities since they would still have all their domestic chores to cope with in addition. However, in Masya Parish, which was the most efficient in running its CDTI programme, a male CDHW or a local leader collected the ivermectin from the nearest designated centre, the clan leaders and local council members supported the female CDHWs by mobilising the community members, and the women-folk participated in the dissemination of information about mass treatment with ivermectin (i.e. the time and place for receiving the drug). As a result, none of the 36 (65.5%) female CDHWs who completed their distribution allocations in less than a week, complained of being overburdened. Each had no more than 30 people to treat and only a maximum of one hour per day for 3 days was needed to complete the distribution. Each kinship zone produced one report, with the female CDHWs preparing their reports collectively in consultation with one another. Most of the reports of the female CDHWs on the number of people treated, tablets used, number of people not yet treated, and the balance of tablets, were accurate. In contrast, the male CDHWs, although tending to look more confident, did not consult with each other and made many mistakes in their reports.

Incentives

In the Rukungiri District CDTI programme, the responsibilities of the Ministry of Health, the local district health services, the Carter Center, Global 2000, as the cooperating non-governmental development organisation, the communities and the CDHWs had been explained, discussed and agreed upon before distribution started. As a result, there were no demands for external monetary incentives or incentives in kind. This desirable behaviour, which has been observed whenever and wherever CDTI activities are implemented at the kinship level (Katabarwa *et al.* 1999), was not altered by the presence of female CDHWs.

Effect of a male-dominated health delivery system

In rural Uganda, the majority of district medical personnel, qualified medical assistants, health inspectors and health educators are male. In the CDTI programme, it is these categories of medical workers who are supposed

to interact with and give health education to community members, and to train and supervise the CDHWs. These people are few in number and mostly busy at their health units. Therefore, they do not always perform well as supervisors at the community level and they probably portray biomedicine as a male domain. The absence of female medical workers who could interact with and demonstrate to the women folk, encouraging them to become involved in biomedical activities, made it difficult for community members not to consider males as being the only actors in biomedicine.

Communities, and especially their womenfolk, need to see real examples of females working in the medical field since this will enhance the involvement of women in CDTI activities. So far, most females in the medical field in Uganda have been nurses and midwives, who tend to live and work in health units as givers of healthcare, and who rarely interact with community members in their homesteads. In rural areas, these female medical workers are still very few. Surprisingly, when the community members in Masya were told during health education that they should select more women as well as men to be CDHWs, the number of women selected exceeded the number of men. This shows that women need to be encouraged to take initiatives in matters which may seem foreign to what has hitherto been perceived as their role.

Conclusions

For CDTI activities to succeed and be sustained, it is imperative that more women should be encouraged to become involved in CDTI activities. The giving of healthcare used to be the domain of women until biomedicine disenfranchised them, making the profession look like a male monopoly. The CDTI programme in Uganda should adopt a policy of facilitating communities to select as many female CDHWs as possible at the kinship level. Females usually form the majority in a community and are highly suitable for CDHW work since they normally remain within their communities for most of the year, while the men tend to go out to earn a living. Their recruitment would ensure enough CDHWs in kinship zones and avoid overburdening any individual. However, it is important that male CDHWs should also be maintained to work closely with female CDHWs since community members have recommended this. Wherever possible, CDTI activities should be implemented at the kinship level because this reduces the distance to treatment centres, thus making for convenience, more rapid distribution and eliminating the need for incentives.

There is also a need for the CDTI programme to recruit more female supervisors, whose responsibility

would be to ensure the smooth running of mass treatment through: (1) carrying out health education in the kinship zones; (2) training CDHWs; (3) managing adverse reactions; and (4) keeping records and reporting. Supervisors do not have to be qualified health workers – they may be retired civil servants, teachers or any other category of educated women in the community – but they need to work in communities close to or where they reside so as to provide a practical example of women being involved at that level. A female supervisor, once established, will not only build confidence in herself, but will also become a role model for other women in her community. She will be identified by women as one who facilitates interaction amongst women and helps them to solve their personal and family problems.

Of significance is the belief among the women that ivermectin does not stop itching of onchocerciasis or make one feel good. Since onchodermatitis is very important as far as onchocerciasis in Uganda is concerned (Ovuga *et al.* 1995), there is need to study the feasibility of distributing ivermectin more frequently than once a year (e.g. at 3-, 4- or 6-monthly intervals) using CDTI strategy, and to assess the impact of these regimens not only on the itching caused by *O. volvulus* infection but also on the transmission of the parasite.

The present study has shown that the active involvement of women is not a mere feminist gimmick, but a necessity and a potential reality if the majority of community members are to benefit from the many community healthcare programmes which are now being promoted. However, active involvement of women in CDTI programmes will require continuous monitoring and learning from communities the best way of doing it without antagonising community members. Their active involvement in other community healthcare programmes, such as the control of HIV/AIDS, malaria, tuberculosis, trachoma, lymphatic filariasis, schistosomiasis, leprosy and mother/child healthcare, requires further studies.

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References

- APOC/WHO (1998) *Community-directed Treatment with Ivermectin (CDTI): A Practical Guide for Trainers of Community-Directed Distributors*. African Programme for Onchocerciasis Control/World Health Organisation, Geneva.
- Colson E. (1966) The alien diviner and local politics among the Tonga of Zambia. In: *Political Anthropology* (eds M.J. Swartz, V. Turner & A. Tuden), pp. 221–228. Aldine, Chicago, IL.
- Haviland W. (1997) *Anthropology*, 8th edn. Harcourt Brace, Orlando, FL.
- Katabarwa N.M., Habomugisha P., Ndyomugenyi R. & Agunyo S. (2001) Involvement of women in community-directed treatment with ivermectin (CDTI) for the control of onchocerciasis in Rukungiri District, Uganda – a knowledge, attitude and practice study. *Annals of Tropical Medicine and Parasitology* **95**, 485–494.
- Katabarwa N.M., Habomugisha P. & Richards F.O., Jr (2000a) Community views on health programmes in Uganda. *The Lancet* **355**, 2167–2168.
- Katabarwa N.M., Mutabazi D. & Richards F.O. Jr (1999) Monetary incentives and community-directed health programmes in some less-developed countries. *Lancet* **354**, 1909.
- Katabarwa N.M. & Richards F.O., Jr (2001) Community-directed health (CDH) workers enhance the performance and sustainability of CDH programmes: experience from ivermectin distribution in Uganda. *Annals of Tropical Medicine and Parasitology* **95**, 275–286.
- Katabarwa N.M., Richards F.O., Jr & Ndyomugenyi R. (2000b) In rural Ugandan communities the traditional kinship/clan system is vital to the success and sustainment of the African Programme for Onchocerciasis Control. *Annals of Tropical Medicine and Parasitology* **94**, 485–495.
- Kuzma J.W. (1992) *Basic Statistics for the Health Sciences*. Mayfield Publishing, Palo Alto, CA.
- Melissa A. & Miner J.R. (1997) *Using EPI INFO – A Step by Step Guide*. TouconEd Publications, Soquel, CA.
- Ovuga E.B.L., Okello D.O. & Ogwal-Okeng J.W. (1995) Psychological aspects of onchocercal skin disease in Nebbi District, Uganda. *East African Medical Journal* **72**, 295–298.
- Rekdal O.B. (1999) Cross-cultural healing in East African Ethnography. *Medical Anthropology Quarterly: International Journal for the Analysis of Health* **13** (4), 458–474.
- Salant P. & Dillman D. (1994) *How to Conduct Your Own Survey*. John Wiley & Sons, Chichester.
- Taylor H.R., Pacque M., Munoz B., Greene B. & R. (1990) Impact of mass treatment of onchocerciasis with ivermectin on the transmission of infection. *Science* **250**, 116–118.
- Whitworth J.A.G., Downham M.D., Lahai G. & Maude G.H. (1996) A community trial of ivermectin for onchocerciasis in Sierra Leone: compliance and parasitological profiles after three and a half years of intervention. *Tropical Medicine and International Health* **1** (1), 52–58.
- WHO (1995) *Onchocerciasis and its Control: Report of the WHO Expert Committee on Onchocerciasis Control*. WHO Technical Report Series 852, World Health Organisation, Geneva.
- WHO-AFRO (1996) *Community-Directed Treatment with Ivermectin. Report of a Multi-country Study*. World Health Organisation, Geneva.
- World Bank Report (1993) *Uganda Social Sectors: A World Bank Country Study*. World Bank, Washington, DC.