Malaria Case Study

Improving Malaria Case Management in Ugandan Communities: Lessons From the Field

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Minnesota International Health Volunteers (MIHV) is an international and domestic non-profit organization founded in 1979 whose mission is to improve the health of women, children, and their communities around the world. Its core competencies are: community mobilization, community health partnerships, research and evaluation, education and training. MIHV has over 25 years' experience designing and implementing large-scale maternal and child health programs in Kenya, Nicaragua, Tanzania, Thailand, Haiti, and Uganda. MIHV is a member of The CORE Group.

The Child Survival Collaborations and Resources Group (**The CORE Group**) is a membership association of more than 35 U.S. nongovernmental organizations that work together to promote and improve primary health care programs for women and children and the communities in which they live. The CORE Group's mission is to strengthen local capacity on a global scale to measurably improve the health and well being of children and women in developing countries through collaborative NGO action and learning. Collectively, its member organizations work in over 140 countries, supporting health and development programs.

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Acronyms

C-IMCI	Community Integrated Management of Childhood Illness
MIHV	Minnesota International Health Volunteers
NGO	nongovernmental organization
TBA	traditional birth attendant
USD	U.S. dollars
USAID	U.S. Agency for International Development
WHO	World Health Organization

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Introduction

This case study focuses on malaria case management activities implemented in Ssembabule District, Uganda, by Minnesota International Health Volunteers (MIHV) during the second phase of a U.S. Agency for International Development (USAID)-funded Child Survival project (1996-2000). MIHV's approach was grounded in the principles of Community Integrated Management of Childhood Illness (C-IMCI). The project used a multifaceted behavior change communication strategy, including: (1) training volunteer community members (such as traditional healers and drug vendors) in malaria prevention, symptom recognition, treatment, and referral; (2) organizing Malaria Awareness Days, to provide community-wide education about malaria; and (3) creating Malaria Calendars, a tool to explain age-appropriate treatment.

Because child survival transcends any one illness, the Ssembabule Child Survival Project targeted multiple diseases including: malaria, diarrhea, breastfeeding/nutrition, immunization, maternal health, family planning, and HIV/AIDS. The specific objectives for the malaria component were (1) to increase the use of professional treatment for presumed malaria and (2) to increase women's knowledge of correct chloroquine dosage (the standard protocol at that time) for women of reproductive age and for children under two.

As a result of the project, mothers' knowledge about how to prevent and treat malaria increased significantly. Notably, project interventions contributed to the following changes in Knowledge, Practice and Coverage Survey results:

- Mothers' knowledge of bed nets as a method of preventing malaria jumped from 8 percent in 1996 to 41 percent in 2000.
- Mothers' knowledge of mosquito bites as a cause of malaria increased from 45 percent in 1996 to 72 percent in 2000.
- In 2000, 71 percent of mothers seeking malaria treatment for the youngest child in the household attended health units for such treatment, up from 32 percent in 1996.
- Mothers' knowledge of appropriate chloroquine dosage for adult women increased from 6% in 1996 to 41 % in 2000.
- Twice as many mothers knew the correct chloroquine dosage for children under two years of age in 2000 as compared with 1996.

Key conclusions from the project include:

- Mothers with limited education can be taught to treat uncomplicated malaria in children in an appropriate way;
- Multiple, reinforcing, integrated, approaches are most effective in changing behaviors; and
- Community members, such as traditional birth attendants (TBAs), traditional healers, and drug vendors, are necessary and powerful allies in implementing malaria activities using a C-IMCI approach.

Project Context

Malaria is a major health problem in Uganda. Transmission is stable and high throughout most of the country with little seasonal variation throughout the year (Ugandan MOH, 2003). It is estimated that malaria treatment alone costs Uganda $50 million USD each year (USAID, 2003). The Ugandan National Plan of Action for the Control of Malaria for 1995-1999 noted that malaria is the most prevalent disease throughout the country and remains the leading cause of mortality and morbidity for women and children under five. Malaria accounts for about 25% of all out-patient care, 14% of hospital in-patient deaths, and 20% of hospital admissions (Ugandan MOH, 1994). A Roll Back Malaria baseline assessment in four districts in 2001 estimated that 70,000 to 100,000 Ugandans die each year from malaria, of which the majority are children under five years of age (Uganda MOH, 2003). Malaria control remains a significant challenge and, in 1994, the Ugandan Ministry of Health acknowledged "over the past two decades there has been virtually no effort to control malaria in Uganda because of political turmoil."

Ssembabule District At-A-Glance

Geography
Area: 2,500 km^2/ 229 villages

Demographics
Population: 170,000 inhabitants including:
- 6,500 infants
- 26,700 children aged 1-5 years
- 30,900 women of reproductive age

Infant mortality rate: 122 per 1000 live births
Under-five mortality: 180 per 1000 live births
Maternal mortality: 500 per 100,000 live births
Languages: Luganda and Runyankole
Religious groups: Catholics, Protestants, and Muslims
Economy: agriculture and animal husbandry

Systems infrastructure
No electricity or telecommunications system
No paved roads, No central sewage/water supply
Health sector: 1 rural hospital, 10 clinics and numerous traditional birth attendants, traditional healers, and private drug vendors.

The Ugandan Ministry of Health (1994) has identified the following obstacles to effective malaria control:

- The majority of malaria episodes are handled through self-medication, drug vendors, and other private sector providers.
- Many different types of antimalarials (quinine, sulphadoxine-pyrimethamine, metakelfin and halofantrine) are freely available in pharmacies, private clinics, and drug shops and are therefore readily accessible to the public.
- Both health workers and the public engage in under-dosing and indiscriminate use of antimalarials.
- Inappropriate use of second- and third-line drugs continues in Uganda (chloroquine was the first line drug at that time).

Furthermore, a World Health Organization (WHO) assessment in four districts found that malaria case management remains poor since only 28% of patients seen at a health facility are correctly managed and only 7% of children's' caregivers seek treatment within 24 hours (Ugandan MOH, 2003).

In Ssembabule, mothers interviewed as part of MIHV's baseline and final Knowledge, Practice and Coverage surveys in 1996 and 2000, respectively, confirmed that they perceived malaria as the most frequent and serious health problem for both themselves and their children. Data for Ssembabule District in 1993 showed that, on a monthly basis, up to 57% of children under five and up to 50% of all pregnant women were diagnosed with malaria. The baseline survey also confirmed that, for the majority of malaria cases in children, treatment was sought from untrained providers (especially drug vendors) rather than from health units.

Ssembabule District is one of the most underserved and remote districts in Uganda.

In focus groups conducted by MIHV at the start of the project, community members were asked, "Why don't people seek treatment from a health professional for malaria?" Responses included the following:

- "We feel that we can treat ourselves [for malaria] by buying drugs from small shops." (Ntuusi sub-county)
- "Sometimes we take it to be the season where we must get fever [malaria], so we feel it is inevitable...we wait until it's over and will get well soon. The maize harvesting season is one of these times." (Ntuusi sub-county)
- "Because of poverty, some people are not able to [seek professional treatment for malaria]; so they might end up buying tablets in incomplete doses." (Mateete sub-county)
- "There are very many mosquitoes so, even if the malaria is treated, it comes back in a flash. People don't see any reason why they should waste their money [on professional treatment]." (Lwemiyaga sub-county)
- "[People] think that herbs will help them, and think of going to health units only when herbs do not cure them. Also, some people are afraid of injections so they go to traditional healers." (Lugusulu sub-county)

Based on findings and discussions with Ministry of Health staff, MIHV project staff (who had worked in the district since 1992), community members, and representatives from schools and religious institutions, malaria control was chosen as one of the project's child survival interventions. The project team chose to target women of reproductive age and children under two in Ssembabule District. During the project period, the District experienced unusually high levels of malaria transmission, including several epidemics.

Approach and Implementation

1. Training community volunteers

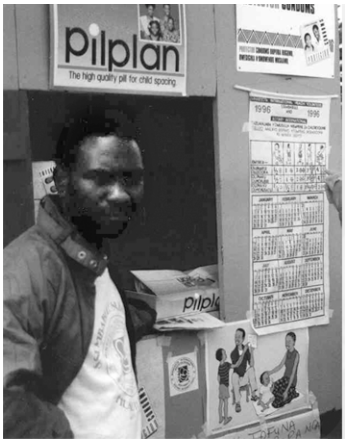
The goal of MIHV's Ssembabule Child Survival Project was to reduce morbidity and increase the survival of children and mothers through the use of simple, low-cost technologies at the community level. The project emphasized training a large network of community volunteers including community immunizers, traditional birth attendants, drug vendors, traditional healers, health unit and malaria control staff, village-level data collectors, community-based distributors, peer educators, Ugandan medical and nursing students, and members of women's groups. Although the primary focus of the malaria intervention was on the training of traditional healers and drug vendors, all volunteers received basic training on malaria (prevention, signs and symptoms, treatment). Community members were generally trained by geographic cluster (usually at the sub-county level) so that people working in the same area could get to know each other, and needs specific to that area could be addressed in training.

At the time of the project, the ratio of health care workers to District residents was estimated at 1:1,644. Through the project, the ratio of community volunteers to the population dropped to 1:61. Though other organizations also utilized volunteers in their child survival activities, MIHV's use of community volunteers on such a large scale was unique. This model was considered to be the most sustainable option for Ssembabule, given a strained government health infrastructure and the District's relatively recent inception (in 1997). Despite a relatively small team of core MIHV project staff, the project was able to expand its reach throughout the District by establishing a large task force of trained community volunteers who disseminated information about malaria in their communities and institutions. By the end of August 2000, close to 1,000 community members were providing 5,000 hours of service per month on a volunteer basis.

The project monitored every community volunteer quarterly. The monitoring team consisted of MIHV project staff and representatives from the District Health Team and the local health unit, so that relevant government health staff could develop relationships with volunteers, and district monitoring and supervision skills could be upgraded. Community volunteers also completed monthly and quarterly reports, sending them to MIHV, who then forwarded them to the District.

Even while the project was in operation, its systematic monitoring system was reinforced by a variety of self-governance mechanisms. For example, traditional birth attendants and malaria control staff participated in associations who also conducted site visits, ensuring quality, checking records, and reporting any problems back to MIHV.

To sustain motivation and provide incentive, MIHV provided some volunteers (i.e., community immunizers) with bicycles and boots as well as training on income-generation activities. MIHV also lobbied sub-county local councils to provide monthly stipends to community immunizers. This approach was successful in one sub-county, which committed part of its budget to support these volunteers. Providers such as traditional birth attendants and drug vendors did not need the stipends because the community was willing to pay for their services.



Community-based distributors sold bed nets, condoms, and contraceptive pills, and distributed free malaria calendars.

Community reliance on traditional healers and drug vendors

According to the Ugandan Ministry of Health, as many as 90% of women nationwide first seek health care services from traditional healers and/or drug vendors, even in the most resource-rich towns and cities. This is also true for Ssembabule District. MIHV's survey of more than 100 traditional healers in the project area revealed that adults and children regularly seek their services to treat suspected malaria. Similarly, despite the fact that few of Ssembabule's 300 drug vendors had been formally trained and few of their shops were registered or regulated, they enjoyed enormous respect. In an environment where access to health services is poor, and clinics frequently experience drug shortages, caregivers go directly to drug vendors, thereby eliminating the need to visit a trained health provider, who is perceived as a "middle man." Reliance on traditional healers and drug vendors is the result of patients' confidence in their abilities, lack of financial resources, and problems with clinic access and quality.

Patients in Ssembabule have confidence in *traditional healers* because they are well known members of the community and part of local tribal structures; are easily accessible since they are located in the community; offer supportive, positive attitudes to healing; conduct home visits and provide follow-up care; and have long-standing relationships with some families.

Similarly, *drug vendors* are relied upon because of their doctor-like status in the community; their relatively consistent supply of medications (chloroquine is readily available in drug shops, general shops and markets in the project area); their presence in the community –especially where clinics are not available; and their role as dispensers of medicine and advice after a patient's visit.

Training Community Volunteers and Health Unit Staff

Volunteer Groups	Total Trained
Traditional healers: The training curriculum for traditional healers focused primarily on malaria (prevention, signs and symptoms, treatment, and referral) as well as diarrheal disease.	50
Drug vendors: The training curriculum for drug vendors focused primarily on malaria (prevention, signs and symptoms, treatment, and referral) as well as diarrheal disease, with an emphasis on rational drug use.	167
Traditional birth attendants: TBAs were trained primarily on safe motherhood, nutrition, breastfeeding, immunization, family planning, and STDs/HIV/AIDS, but also on malaria during pregnancy (risks and treatment).	200
Community immunizers: Community volunteers were selected and trained to assist with childhood immunization (at health units and on National Immunization Days) and cross-trained on malaria.	60
Peer educators: These volunteers were based in primary and secondary schools. Initially trained to counsel peers about HIV/AIDS and STD prevention through dramas, music and poetry, they were eventually cross-trained on other child survival interventions, including malaria. Peer educators also participated in 95 school health clubs established by the project.	280
School-based facilitators: Facilitators were school teachers trained to lead school health clubs, and monitor and supervise the activities of peer educators.	78
Members of women's groups: About 40 women's groups were formed and trained in income-generating activities (e.g. goat rearing, book keeping, management) as well as basic home health education, including malaria education.	400
Community-based distributors: The project identified and trained community members to distribute condoms to bar and lodge attendants as well as set up kiosks in major markets throughout the District. These kiosks sell condoms, contraceptive pills, and bed nets, as well as give out malaria calendars. They also provide free ORS and latex gloves to TBAs at cost.	90
Health unit staff: The project worked in close collaboration with government and non-governmental health unit staff, providing yearly skill upgrades (including updates on national anti-malarial guidelines) and involving health unit staff in supervision and monitoring of community volunteers.	25
Malaria control mobilizers and coordinators: The project trained these government malaria staff on the national malaria policy as well as social marketing of bed nets, and included them in drug vendor monitoring activities.	10
Village-level data collectors: In three sub-counties, the project identified and trained community volunteers to pilot a village-level disease surveillance system, which monitored the incidence of seven communicable diseases including malaria.	28
Student doctors and nurses: The project was a field site for nursing and medical students from Mbarara and Masaka Medical Schools who obtained a practical introduction to village-level primary health care through the project. Students were particularly active in community mobilization and provision of services on Malaria Awareness Days.	200 nurses 75 doctors

Local residents expressed a lower preference for clinics due to staff shortages, shortages of medicines and other supplies, negative attitudes and poor morale among health care providers, distance to clinics, and the perception of clinics as a "last resort," only to be accessed if home treatment fails.

Drug vendors are a common source of antimalarials for people living in Ssembabule.

Selecting traditional healers and drug vendors for training

Because of the overwhelming reliance of caregivers on the informal health care system for antimalarials, the MIHV project focused on training drug vendors and traditional healers to provide accurate advice and correct doses of chloroquine to mothers. To identify the most respected and best-qualified potential participants for training, project staff interviewed key informants and held discussions with community leaders and women's groups. In selecting this initial pool, staff identified traditional healers and drug vendors who could influence not only caregivers but also other providers.

One hundred traditional healers identified in this manner were surveyed on current malaria treatment practices, client population, service fees, and any follow-up care practices. The survey revealed that traditional healers see about three to four patients per day, their patients are loyal, they primarily see children for symptoms of malaria and diarrhea, and they are able to provide some follow-up care.

Although none of the mothers surveyed in the baseline Knowledge, Practice, and Coverage survey reported taking a child to a traditional healer, treatment by this group of providers is not unusual. Traditional treatment of malaria (and related enlarged spleen) usually consists of cutting and bleeding the patient, which is perceived as a way of removing 'bad blood', reducing the swelling, and relieving pressure. Concoctions prepared with specific herbs and certain vegetables are also used for treating malaria. Traditional healers referred some cases but did not have confidence in or any established connection with the formal health care system.

Project staff conducted an initial survey of drug vendors to determine the most common illnesses treated, their areas of interest and their current level of health knowledge. The assessment included questions about drug vendors' licensure status, educational level, geographical location, proximity to health units, monthly drug sales, and consumer visits. Drug vendors were

known to be the most common source of antimalarials in the district. A key issue was the practice of selling partial courses of antimalarials to clients who could not afford a complete course of treatment; sometimes drug vendors preferred any sale to no sale, and sometimes they believed that partial treatment was better than no treatment at all. Drug vendors were extremely receptive to the goals and objectives of the project because many had prior experience working with MIHV, as immunizers or as community-based distributors. Overall, they were interested in increasing their knowledge and status in the community.

Training and monitoring traditional healers and drug vendors

Prior to their formal training, the project held a meeting of identified traditional healers and drug vendors at the sub-county level to introduce them to MIHV's child survival activities and gauge their interest in malaria recognition, treatment, and referral.

Traditional healer training: Fifty traditional healers participated in an initial three-day training on malaria prevention, signs and symptoms, treatment, and referral. Refresher trainings were held at the sub-county level every six months. They responded very positively to the training: they appreciated being able to learn new things, being able to tell others that they had received the training, and being recognized for their professional expertise and capability. Trainings were designed and conducted by members of the District Health Team with assistance from MIHV field project staff. This was the first step in building improved relations between traditional and trained health providers. Improved relations involved recognizing common goals (so that traditional healers and trained providers did not necessarily view each other as "competitors"), recognizing limitations (traditional healers could not successfully treat all cases and needed to refer seriously ill children, and clinic staff could not provide the sort of community outreach and follow-up routinely provided by traditional healers), and developing mutual respect (clinic staff began to see, for example, that many traditional practices had merit).

Drug vendor training: Out of about 300 drug vendors working within the District, the project trained 167. An initial three-day training was followed by subsequent one- to two-day trainings, which took place every three to four months. As with traditional healers, the District Health Team and MIHV field project staff were involved in the training of drug vendors. The training curriculum was based on the findings of the initial survey of drug vendors. Specific training objectives included: explain basic factors about malaria transmission, identify at least three signs and symptoms of malaria, describe three danger signs and symptoms of malaria which require immediate referral, dispense age-appropriate doses of chloroquine tablets for malaria treatment (in accordance with national guidelines), list four ways in which drugs can be abused or misused, explain four possible ways of preventing malaria, and describe vendors' role in the community.

The training also addressed the practice of providing partial courses of chloroquine. As a result of the training and follow up, drug vendors offered a commitment to refer clients who could not afford a full course of chloroquine (though this commitment was not always met). The project

provided drug vendors with posters called "malaria calendars" displaying age–appropriate dosage information. These were provided as an incentive to drug vendors and to reinforce training content.

Drug vendor trainings were highly successful, and motivation within the group was high. Turnout at the trainings was usually 95–100%. When comparing their pre- and post-test results, 85% of all shopkeepers had correctly learned how to properly treat malaria and when to refer severe cases. Although drug vendors were not paid a stipend, and lost money whenever they closed their shop to attend trainings, they attended because they valued the information and skills learned in the training.

Traditional healer referral and monitoring: The relationship between traditional healers and District Health Team staff was formalized through the establishment of a referral system and by involving clinic staff whenever possible in monitoring and supervision. For example, staff from the District Health Team visited traditional healers in their homes, discussed patients, reviewed diseases treated, referrals made, and follow-ups with families (to check whether caregivers had followed their advice and whether children responded to treatment). Monitoring also involved (1) interviewing village leaders to see whether they recognized an increase in the skills of traditional healers; and (2) reviewing the numbers of referrals made and the overall attendance at health units. Community leaders did not necessarily change their perception of traditional healers' skills, but they and health unit staff did recognize a large increase in timely recognition of serious cases, an increase in referrals, and an increase in attendance at health units.

Drug vendor referral and monitoring: As with traditional healers, the District Health Team was involved in quarterly monitoring and supervision of drug vendors. Because many of them had already been MIHV-trained volunteer community immunizers, they already had a working relationship with health units. Monthly reporting forms were designed so that drug vendors kept a record of how much chloroquine they dispensed and to whom; recording whom the client was, his/her age, the drug name, the number of tablets sold, and any follow-ups or referrals made. These data were reviewed by District Health Team and MIHV field project staff during monitoring visits. During these visits, supervisors used a checklist, developed by the project, which included questions such as: Have you benefited from the training you received? Have you held health education sessions in your community? On which topics? How many sessions? Where? What problems do you encounter when selling drugs? Would you like to apply for a license to sell drugs?

During training and follow-up, project staff emphasized helping drug vendors recognize their limitations so they would be more likely to refer serious cases. Because of the status granted to them by communities and the frequent absence of trained health care providers in the area, even the least qualified drug vendor could sometimes overestimate his/her own knowledge and expertise. The project emphasized that it is not good for business to give clients inaccurate advice, and that it is acceptable for professionals to refer cases to a trained provider when it is in their client's best interest. While drug vendors already knew this, it was important to discuss the issue openly and reinforce professional norms.

Nurturing professional associations

The project also ensured sustainability by assisting traditional birth attendants and drug vendors in their successful attempts to form self-governing professional associations. The Drug Vendor's Association forms an important bridge between drug vendors at the community level and the National Drug Authority. MIHV facilitated the association's quarterly and annual general meetings, arranged study tours, promoted safe malaria drug/bed net sales, conducted refresher trainings for members, and tracked drug vendor records. Using government standards, the association began working with the District Health Team to register and govern the activities of drug vendors in the District. Association representatives joined MIHV and health unit staff to conduct drug vendor monitoring visits. The association was also active in holding meetings for its 100 members and making recommendations to the District Health Team regarding additional training needs. By working closely with district and clinic staff, and communicating professional norms to its members, the association plays a critical sustainability and quality assurance role.

2. Conducting Malaria Awareness Days

There were several malaria epidemics in Ssembabule during the project and in one case, peaks in malaria cases coincided with a National Immunization Day. As a result, many parents believed that the immunizations had caused malaria in their children. To address suspicions about malaria and immunization, the project sponsored about 30 special community events at parish level, known as Malaria Awareness Days. The purpose was to focus community attention on malaria and to provide malaria-related services such as testing and treatment. Community members responded positively to the combination of festive activities and access to health resources. For example, people came from miles away to watch a video of the king's wedding (which had never before been screened in the area), and then stayed for a malaria video and lively discussion. People traveled great distances to attend and, on average, there were about 1000 to 1500 participants per event. At several of these events, more than 400 people were treated for malaria in a single day.

In addition, project staff organized competitions and games, and distributed prizes for the best poem or song about malaria. These were successful in part because the project offered desirable prizes (e.g., radios, cameras, walkmans). One activity involved a "malaria quiz" consisting of a series of statements about malaria prevention and treatment as well as common

Community volunteers stage a drama about malaria at one of MIHV's Malaria Awareness Days.

myths. Participants were asked to state 'true' or 'false' after each statement. Some examples of false statements in the quiz were: "Buying a net and keeping it safely in the house without using it can help prevent malaria," "Use of mosquito nets has increased the incidence of malaria," and "You can stop taking tablets of chloroquine as soon as you feel better."

Community mobilization for Malaria Awareness Days

Malaria Awareness Days were extremely popular and successful, largely as a result of community mobilization done by traditional birth attendants, traditional healers, drug vendors, and other project-trained community volunteers. MIHV also relied upon existing sub-county and Village Health Committees. Village Health Committees, established by government mandate, worked closely with the project to develop strategies, share information, and mobilize communities. Involvement of these trusted committees gave the project credibility and raised interest in Malaria Awareness Days. While politicians or clinic staff might encourage popular support for events because they had been told to do so by their superiors, community members needed to be personally convinced before they would endorse them.

Project staff went to each village in the catchment area of a Malaria Awareness Day, talked to traditional healers and drug vendors to explain what they were planning and why, and to answer questions. Staff were able to garner their support by providing an overview of child survival interventions as part of the healers' and vendors' initial training. Once involved, they were critical in galvanizing support in the community. They went house to house (including on the day of the event), spoke at village council meetings, and talked to people in markets, describing the event and why it was important to attend. Caregivers trusted their opinion and were swayed by their enthusiasm; they knew they could get "straight answers" from them.

A project- trained community member explains why it is important to seek prompt care for malaria.

3. Developing malaria calendars

Because Ssembabule is a remote district with limited information networks, the project focused on sustainable communication channels, rather than expensive mass media. Information, education, and communication materials related to malaria were developed by MIHV with Ssembabule in mind, using formative research such as focus groups to address misconceptions specific to the community. The main tool created was the "Malaria Calendar," a poster that was intended as a quick reference tool to

show appropriate chloroquine dosages for different age groups. These were developed in English, Luganda and Runyankole, the three major languages in Uganda. The most widely used local terms for malaria in the project area are: *omusujja gwe nsiri*, in Luganda, which translates as 'fever from mosquitoes'; and *omushijja,* in Runyankole, which means 'fever'.

In a simple table format, which followed national guidelines, the poster showed how many chloroquine tablets should be taken (for days 1,2, and 3) by age group (ages 0–1 years, 1–3 years, 3-4 years, 5–7 years, 7–10 years, 11–15 years, and 15 years and above). Drawings depicted whole and half tablets as well as the various age categories. In addition, drawings also illustrated various personal protection and environmental control methods with statements such as: "Stop malaria before malaria stops you," "Close your window shutters," "Use mosquito nets," "Don't leave standing water near your house," and "Remember to see the doctor/health professional if the chloroquine tablets are finished and you are not feeling better." The central panel of the poster displayed a simple calendar and a new poster was produced annually, for each year of the project. Around 4000 malaria calendars were distributed throughout the District.

These simple malaria calendars were well-received among mothers, drug vendors, and traditional healers, who continued to keep them on their walls after the project was completed. This approach was so effective that it gave rise to a similar maternal health calendar during the third year of the project. MIHV also produced caps and T-shirts with messages about malaria such as: "I use a bed net—do you?"

Malaria calendars were well-received among mothers, drug vendors, and traditional healers, who continued to keep them on their walls after the project was completed.

Project Staffing/Costs

Because staff were involved in multiple disease areas and projects, it is not possible to disaggregate staff time specifically for the malaria interventions. Implementation of MIHV's child survival activities was possible using a small team of core technical staff based in Uganda, consisting of: an expatriate Project Director, a Program Coordinator, a Maternal Child Health/Family Planning Coordinator, an Administrative Coordinator, a Malaria Control Coordinator, a Health Education Coordinator, a Community Development Coordinator, and a Microfinance/Income Generation Activities Coordinator. Level of effort for all staff was 48 person-months except for the Microfinance/IGA Coordinator, who was hired for 12 person-months and was a Peace Corps volunteer. The project enjoyed good staff retention, since all of the technical staff had been with the project for at least five years. The project also received significant technical, administrative, and financial backstopping from MIHV headquarters. International volunteers from MIHV, PATH Canada, and the Peace Corps also participated in the project.

For activities in Ssembabule District for the period September 1996-August 2000, MIHV received a total of $ 1,000,000 USD from USAID, of which 15% was dedicated specifically to the malaria interventions. MIHV contributed a total of $ 343,592 USD in matching funds from a variety of sources including the Child Health Foundation, the Conservation, Food, and Health Foundation, the Scandia Foundation, Rotary International, and MIHV in-kind services.

Results

The results of the malaria program intervention were measured using indicators from the baseline and final Knowledge, Practice, and Coverage surveys conducted in 1996 and 2000, respectively.[1] A comparison of these two surveys provides an indication of the project's success, which surpassed all of its objectives (see table).

Select Malaria Results: Baseline and Final Knowledge, Practice, Coverage Surveys

Indicator	1996 results (%)	2000 results(%)
Mother's knowledge of causes of malaria		
mosquito bites	45	72
drinking bad water	19	21
rain	6	20
dirty environment	5.5	18
Mother's knowledge of methods of malaria prevention		
use mosquito nets	8	41
cut vegetation	12	29
reduce stagnant water	10	18
spray with insecticide	8	17
take tablets	16	17
malaria can't be prevented	19.5	1
Mother's knowledge of chloroquine use		
correct dosage for adult women	6	41
correct dosage for 0-24 month old child	10	23
Place where malaria treatment was sought for the youngest child in the household		
drug vendor	48	4
traditional birth attendant	10.5	0
traditional healer	0	4
health unit	32	71

1. The KPC survey was modeled after the basic principles contained in the Johns Hopkins University Survey Trainer's Guide for PVO Child Survival Project Rapid KPC Surveys (July 1995 Edition). The methodology used for the baseline survey in 1996 and the final survey in 2000 were consistent with one another. The WHO EPI 30 Cluster sampling method was used to arrive at a sample size of 300 households.

Discussion

- *Knowledge about causes of malaria:* There was an appreciable increase in the number of mothers who knew that mosquito bites cause malaria, and there was a three-fold increase in the number of mothers who associated malaria with rainfall. However, one in ten mothers still reported that they did not know what caused malaria, and one in five still believed that malaria was associated with drinking bad water.
- *Knowledge about methods of malaria prevention*: Mothers' knowledge about how to prevent malaria increased for most prevention methods, and only 1% still believed that malaria could not be prevented. However, in the final survey, one in five women said they did not know how to prevent malaria. Although many women knew that mosquito nets could prevent malaria, few households owned a net. Project staff estimated that about 90% of households in Ssembabule did not own a net, with major barriers to ownership being high cost (approximately $ 10 USD) and low availability in the district.
- *Knowledge about chloroquine use*: Although the recommended dosage for chloroquine was revised during the life of the project, significantly more mothers were able to correctly report the dosage needed for themselves and for children less than two years of age.
- *Care-seeking behavior*: Care-seeking behavior for malaria improved markedly as a result of the intervention. At baseline, most mothers sought care for their children from drug vendors. In 2000, the majority of childhood malaria cases were being dealt with at health units. Around one-fifth of cases were still being treated at home, but project staff felt that this was because mothers had increased their confidence in using anti-malarials and were better able to successfully treat uncomplicated cases themselves. It was common in the project area for mothers to store medication for common ailments, including chloroquine, at home.

Considerable additional anecdotal evidence and qualitative data also demonstrated project successes. For example, through interviews with mothers and community leaders, and from referral form data (for traditional healers and drug vendors), the project learned that the referral system resulted in increased attendance at health facilities. Even today, MIHV project staff have reported that many of the malaria calendars produced by MIHV are still hanging in homes and drug shops, long after project completion—an indication that these items were popular in the District.

Training various community members in addition to traditional healers and drug vendors was a sustainable approach. Project-trained community volunteers increased demand for and access to services by educating and counseling clients, providing services, referring clients when necessary, and mobilizing communities to participate in special events and adopt improved health behaviors. Significant numbers have been elected to local (village/parish) council positions, including women. And while there was a predictable level of attrition of these volunteer community health workers, a substantial number served their communities for seven or eight years, and a study of peer educators showed that even those that had finished school continued to counsel peers.

In February 2004, MIHV staff interviewed individuals who had been trained by the project. They recalled the most useful parts of their training as follows:

> Traditional healer: "I was able to refer many malaria patients after the training, and the skills were very useful to me. I was able to train someone else who can help me when I am away at home"
>
> Drug vendor: "One of the most important things about the training was to know about others who are doing the same job [as me] and be updated with information about dosages. Now I can convince someone to take a complete dose [of medication] because in that way it helps both the drug shopkeeper and the client. I was able to refer many cases of malaria after the training and also those who are anemic."

MIHV helped traditional birth attendants in Ssembabule District establish a professional association.

Success Factors

MIHV's project successes are attributable to several key factors.

- Because malaria was recognized by the community as a major cause of death and disease, there was enthusiasm and motivation to address the problem. No matter what the topic of a community presentation or special event, mothers always wanted to learn more about how to prevent and treat malaria.
- Chloroquine, the first-line drug, was easily available, inexpensive, and generally effective at that time.
- Because MIHV was the first and only international private voluntary organization in the district, the project received immense support (partly because the community was not jaded by overexposure to external interventions).
- When MIHV began working in Ssembabule in 1992, during the first phase of a USAID Child Survival project, it was then a sub-district of Masaka District. In 1997, during the project period, Ssembabule was one of six Ugandan districts to be granted autonomy, and it became its own district. Decentralization brought both challenges and opportunities. MIHV project staff assisted the District Health Team in a much larger

capacity than initially planned, because redistricting happened quickly in Ssembabule and without adequate training, staffing, or infrastructure development. Decentralization can cause turmoil, especially when districts and communities are not prepared for sudden increases in responsibility, or when an area was resource-poor before decentralization and its population difficult to reach. However, because there was no entrenched power structure in the region, its emerging leaders—many of whom had ties to the project—were free to act on their own initiative. The project therefore had an opportunity to influence both communities and leadership just when communities were learning to take on greater responsibility.

Lessons Learned

- Given the necessary information and reinforcement through simple home-reference materials (e.g., malaria calendars), mothers with limited education can learn to appropriately recognize and treat malaria. Caregivers should be offered more detailed, scientific information about what causes malaria and how it can be prevented. With this information, they will better understand why, for example, immunizations cannot cause malaria.
- While home-based management of malaria is necessary in remote, rural, and underserved areas such as Ssembabule, future projects must also continue to promote the importance of seeking timely malaria diagnosis and treatment from health facilities — especially as these services expand and develop over time.
- In areas where there are limited sources of entertainment and diversion, community-wide special events (e.g., Malaria Awareness Days) can be extremely effective ways to raise awareness about malaria.
- Community providers such as traditional birth attendants, drug vendors, and traditional healers have an important role to play in identifying community priorities; it is critical to emphasize interventions of importance to them. In the case of Ssembabule, malaria was a clear priority; this contributed to community enthusiasm and efficacy.
- Traditional birth attendants are important, highly respected, community-level practitioners who have a definite role in maternal health, particularly in rural, remote areas where trained health care providers are scarce. Involvement of traditional birth attendants also lends credibility to interventions. If they encourage caregivers to immunize their children, parents are more likely to comply; similar pronouncements by politicians or health care providers may be regarded with suspicion.
- A holistic approach can improve the efficacy of individual child survival interventions. In areas that have multiple, pressing health problems and weak health systems—as was the case in Ssembabule—it makes sense to link interventions and cross-train community members in several diseases. For example, a drug vendor trained in malaria prevention would also be able to answer a mother's questions about diarrhea prevention. In this way, project-trained community members were well-equipped to respond to the broader health care needs of the community. Their responsiveness earned the project much respect, leading to greater openness to interventions such as family planning, which was perceived by the community as being a lower priority.

- Training many volunteer community members is critical because it multiplies the opportunities for caregivers to receive accurate information and advice, while improving compliance. This has since become a core C-IMCI strategy in child survival projects.

Conclusion

Given adequate resources, many of the approaches and tools that MIHV developed in this project could be adapted for replication in other districts in Uganda and/or scaled up to the national level. Since the conclusion of this project in 2000, there have been several developments in malaria policy, both globally and in Uganda, which have implications for the replication and scale-up of the interventions mentioned in this report. Faced with growing resistance of *P. falciparum* to chloroquine, Uganda adopted a new antimalarial drug policy in 2002 which recommends sulphadoxine-pyrimethamine + chloroquine as first-line drugs for treatment. Uganda is also implementing a strategy to improve home-based management of fever/malaria through the provision of first-line antimalarials at the community level. Antimalarials are being provided as pre-packaged combinations of these two drugs, known as "HOMAPAK," for children and women.

Specific adaptations of MIHV's interventions might include an update of the malaria calendars to reflect Uganda's new treatment guidelines and include local terms for malaria used throughout Uganda. In Ssembabule and other districts, community members such as drug vendors and traditional healers could be trained in the up-to-date treatment policy using MIHV's approach. Tools developed by MIHV, such as tailored curricula and monitoring/supervision forms, could be shared with other districts as well. Malaria Awareness Days could be held more widely to raise community awareness about current malaria treatment schedules. These activities could also incorporate current developments such as the use of insecticide-treated mosquito nets and intermittent preventive treatment during pregnancy.

Successful replication and/or scale up to the national level will require greater coordination and partnerships among non-governmental organizations (NGOs) active in Uganda, as well as close collaboration with District Health Teams and the Ministry of Health. NGOs have a unique niche: bridging the gap between communities and health facilities, and bringing years of experience, lessons learned, and best practices in community health to global efforts to reduce malaria morbidity and mortality.

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