

**STRENGTHENING UGANDA'S
RESPONSE TO MALARIA (SURMa)
IN MID-NORTH AND KARAMOJA
SUB-REGIONS OF UGANDA**

**Knowledge, attitudes,
practices and behaviours
baseline study**

DECEMBER 2018

Malaria Consortium



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Acronyms

ANC	Antenatal Care
BCC	Behaviour change communications
BOQs	Bills of quantities
CMD	Community Medicine Distributor
DHE	District Health Educator
DHMT	District Health Management Team
FGDs	Focus group discussions
HC	Health centre
HF	Health facility
HW	Health worker
iCCM	Integrated community case management
IEC	Information Education Communication
IPT	Intermittent preventive treatment
IPTp	Intermittent preventive treatment during pregnancy
IRS	Indoor residual spraying
ITN	Insecticide-treated mosquito net
KAPB	Knowledge, attitudes, practices and behaviours
KII	Key informant interviews
LC	Local council
LLIN	Long lasting insecticidal net
MFP	Malaria Focal Person
MoH	Ministry of Health
mRDT	Rapid diagnostic test (for malaria)
NGOs	Non-governmental organisations
OPD	Out-patient department
PACE	Programme for Accessible Health Communication and Education
RDC	Resident District Commissioners
RDT	Rapid diagnostic test
SURMa	Strengthening Uganda's Response to Malaria
UDHS	Uganda Department of Health Statistics
VHTs	Village Health Team members

Acknowledgements

Malaria Consortium would like to thank to all those who contributed to the successful execution of this KAPB baseline study. We are grateful to the various informants from districts, health facilities and community members who provided the valuable information for this baseline. We also thank our staff both in Kampala who supported the study, and espeically our field based team who worked tirelessly to collect data for this study. We are most grateful to UK aid for providing the funding for both the project and this baseline study.

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1 Executive Summary

1.1 Background and objectives

This report presents the findings of a baseline study on knowledge, attitudes, practices and behaviours (KAPB) in relation to malaria control in Mid-North and Karamoja regions of Uganda. The baseline study was conducted as a sub-component of a broader baseline for the Strengthening Uganda's Response to Malaria (SURMa) project, implemented by Malaria Consortium in collaboration with 25 districts in the two regions. The project is funded by UK aid.

The purpose of the KAPB study was to assess health provider and community perceptions towards, and practices relating to, the various interventions to be deployed through the project. The study was expected to provide key information on the context to enable the planning for the project and for the development of an effective communications strategy.

1.2 Methodology

Data for the evaluation was collected during the month of September 2018. The baseline study adopted a cross-sectional design and used both quantitative and qualitative approaches. Data was collected through

- I. structured personal interviews with a sample of 2,270 caregivers of children under five years old and pregnant women
- II. focus group discussions (FGDs) with caregivers of children under five, pregnant women, household decision makers/heads, members of Village Health Teams (VHTs), health workers from health facilities, and local leaders
- III. in-depth interviews with key informants who included members of the District Health Management Team (DHMT), heads of other district departments relevant to malaria control such as agriculture and engineering; medical personnel in charge of health facilities (In-charges); heads of institutions such as police, prisons and schools; road contractors; brick makers; and traditional healers
- IV. observation of household care of mosquito nets; health workers attending to mothers seeking antenatal care (ANC); and health workers managing cases of suspected malaria
- V. review of relevant documents.

1.3 Key Findings

Knowledge about the transmission of malaria

Majority (94.4 percent) of the survey respondents, as well as most VHT participants in FGDs, knew that malaria is caused by mosquito bites. However, this high level of knowledge among caregivers co-exists with the false belief that malaria can also be caused by eating dirty food (10.3 percent) and eating cold food (10.9 percent); these beliefs being more prevalent in the Karamoja districts. Overall, 92 percent of the caregivers of children under five accurately knew that malaria is transmitted through mosquito bites. However, 15 percent believed malaria can be transmitted by other insects such as cockroaches, bedbugs and flies, while 10 percent mentioned other ways of transmission.

Knowledge about symptoms of malaria

Majority of the survey respondents (81.4 percent) could mention fever as a symptom of malaria. Some of the caregivers and family decision makers were able to mention the signs of severe malaria

including loss of energy, paleness and convulsions. However, most caregivers who participated in FGDs could not differentiate between the signs and symptoms of uncomplicated and severe malaria. VHTs across all districts noted that vomiting and convulsions are danger signs of malaria and reported that children with such complications are not supposed to be handled by VHTs but instead should immediately be referred to the nearest health facility.

Knowledge and attitudes towards RDTs

Rapid diagnostic tests (RDTs) as a means of confirming the presence of malaria in one's body were widely known, with 85 percent of the survey respondents mentioning this process. There were generally positive attitudes from caregivers, VHTs and health workers towards VHTs using of RDTs for malaria (mRDTs) to test for malaria. Caregivers and household heads expressed readiness to accept the use of RDTs to test their children for malaria as long as the VHTs were trained. Some of the VHTs who participated in the FGDs also expressed the need for training on how to dispose of used RDTs. Most health workers were happy to use RDTs because they are easier and faster when handling many patients. Health workers pointed out the challenge of convincing patients that it is not malaria if they have malaria-like symptoms but the RDT result is negative. Health workers nevertheless reported that they only treat those whose malaria status has been confirmed with antimalarials.

Knowledge about prevention and treatment of malaria

Across all districts, almost all survey respondents reported that malaria is better treated with western medicines rather than herbal treatments. The overall proportion of respondents reporting this was 98.4 percent. Most caregivers and family decision makers who participated in FGDs knew that Coartem (trade name for anti-malarial medicine) is the recommended first line treatment drug for the treatment of malaria.

Majority of the respondents knew the correct ways of preventing malaria. Those most mentioned were sleeping under a net (78 percent), slashing/clearing bushes and grass around the home (54.3 percent), and denying mosquitoes breeding grounds (39.5 percent) in that order. More than one third of the caregivers (36.2 percent) also specifically mentioned sleeping under an insecticide treated mosquito net. Indoor residual spraying (IRS) was mentioned by 22.6 percent of the respondents. Up to 75.9 percent of the respondents could mention two or more correct ways of preventing malaria.

Pregnant mothers demonstrated high knowledge about malaria prevention during pregnancy. They knew that sleeping under a mosquito net as well as taking Fansidar (IPTp drug brand name) during pregnancy are effective means against malaria during pregnancy. While pregnant mothers who participated in FGDs knew about intermittent preventive treatment in pregnancy (IPTp) for malaria and its importance, some were not sure about the number of times they have to swallow it during a pregnancy.

Knowledge and experience of rectal artesunate among VHTs and health workers

Most VHTs who participated in FGDs have knowledge about the use of rectal artesunate on a child suspected of severe malaria at community level before referral, because they were trained under the integrated community case management (iCCM) programme to offer pre-referral treatment to children under five years. VHTs' attitudes were positive about pre-referral treatment with rectal artesunate because it gives quick relief from fever, and thereby saves lives. But some of the VHTs had not had refresher training for a long time. Health workers and DHMT members are comfortable with the use of rectally administered medicines such as rectal artesunate on children. Many

reported that they have been using rectal medicines such as rectal Valium and some already use rectal artesunate at out-patient departments (OPDs). They also reported that the community would accept the use of rectal medicines, given their experience of using rectal herbal medications.

Caregivers' attitudes towards VHT services

Caregivers appreciated the role played by VHTs especially their accessibility. However, at the time of the survey most VHTs with exception of some districts in Karamoja sub-region did not have Coartem, RDT kits and other supplies such as gloves. Consequently, their role in malaria management was reduced to only providing referral. While it was reported that most caregivers comply with the referral advice of the VHTs, it was also noted that others hesitate to be referred because of several reasons including transport costs, long distances to health facilities and the perceived poor quality of care at the referral facilities.

Caregivers' attitudes towards health facility services

Caregivers and family decision makers who participated in FGDs expressed largely positive attitudes towards seeking care from health facilities. They acknowledged that health facilities offer a level of care that VHTs cannot offer, because health workers are better trained than VHTs and have access to better facilities and equipment, among other reasons. Some caregivers and household heads however expressed their reluctance to seek care from health facilities due to perceived poor quality of services sometimes witnessed in public health facilities, reflected through stock outs of drugs and poor attitudes of health workers.

Attitudes and roles of local leaders and traditional healers

Local leaders in various communities such as cultural, religious and political leaders, were found to be knowledgeable and resourceful, and to hold positive attitudes towards malaria control interventions, including net use, IRS and the roles of VHTs. Local leaders are already playing key roles in malaria control. They also support VHTs in performing their roles.

Traditional healers claimed that they treat common childhood illnesses including malaria, diarrhoea and pneumonia. While some traditional healers knew the cause of malaria and how it can be prevented, others confused the causes of malaria with those of other illnesses such as diarrhoea, talking about dirty food and dirty water. Most traditional healers also claimed that they refer patients including children to health facilities if they think they will not manage them. Others reported that they refer complicated cases to other herbalists. Others yet reported that they send their patients to get tested (for blood, stool, etc.) and then come back for herbal treatment after knowing what they are suffering from. Overall, most traditional healers have positive attitudes towards malaria control and believe people should use long lasting insectidal nets (LLINs) and clear their homesteads of any breeding places for mosquitoes in order to control malaria.

Practices and behaviour in relation to malaria control

The reported actions taken by survey respondents to protect themselves from malaria included sleeping under a net (90 percent), slashing bushes and grass around the homestead (63 percent), draining stagnant water around the home (42 percent), closing windows and doors early (30 percent), and indoor residual spraying (22 percent). Up to 90.7 percent of the survey respondents reported that they used a net the night before the interview. However, observation data show that only 67.6 percent of the nets observed were hanging down from the ceiling/roof of the house over a sleeping space, in a position so as to be used. Of all the observed nets, 34.7 percent showed some holes and in only 44.7 percent of these was there any visible effort to repair the holes.

Barriers to net use were reported to include inadequate nets in households, feeling hot inside nets, itching, as well as social-cultural barriers such as the size and nature of houses and sleeping arrangements, whereby some people sleep on mats placed on floors. Misuse of nets was reported in some communities, with new nets reportedly being used for fishing, for protecting seedlings and young crops, for protecting chicks from predators, for making ropes, for catching white ants, and as bedding.

Less than two thirds (61.7 percent) of the caregivers, whose children aged under five had suffered from malaria in the past three months, reported that they sought treatment within 24 hours. Those who participated in FGDs reported responding quickly in case their children developed malaria symptoms and seeking care outside the home either from the VHTs or health facilities. Key informants also confirmed that caregivers extensively use VHT services in communities where VHTs are trained and equipped.

Re-use and replacement of old nets

Re-use of old nets was widely reported, with most old nets used for fishing, making ropes to tether animals, use as sleeping materials, curtains, catching white ants, for building purposes, for tying firewood, carriers on donkeys, use for scrapping during bathing and washing utensils. Others, particularly women, said they would use old nets for sitting on (in place of a mat), while others reported that they use old nets in the garden to collect sorghum and sunflower, and for sieving crop grains from the chaff, for brewing, and for making chicken houses. Others yet use them for protecting young crops and seedlings.

Household heads and caregivers reported that they would be willing to look for money to replace old nets. However, some reported that they expected the government to give them new nets when the current nets get old.

IPTp use

The coverage of both ANC and IPTp was fairly high, with majority of the pregnant mothers in the survey (81 percent) having attended ANC, with an average of three attendances. Of these, 75 percent had taken IPTp.

Drivers of behaviour

The key drivers of caregiver behaviour in malaria control were found to include caregiver knowledge, distance to the health facility, perceptions and previous experience about the availability of drugs at health facilities, perceptions about the severity of illness, and social cultural and gender factors.

On the other hand, the key drivers of behaviour among VHTs were found to include receipt of training, availability of antimalarials and other necessary supplies, facilitation, level of motivation, and the level of contact/linkage with health facilities and partner agencies.

Potential actors in multi-sectoral malaria control

Other actors, such as schools, police, prisons, agriculturalists and road contractors, acknowledged how their activities contribute to the spread of malaria, and how their members are at risk of malaria. They also acknowledged the need to collaborate in an effort to control malaria. There is therefore a huge potential for Malaria Consortium to collaborate with these actors.

Channels of communication on malaria control

Most participants identified interpersonal channels as the best means to disseminate information about malaria and to influence behaviour change. In particular, it was noted that the main influential agents include local leaders, VHTs, health workers, and political leaders at various levels.

The data on key project indicators is summarised in Table 1 below:

Table 1: KAPB Baseline values on key indicators

Key Baseline objective (by study)	Key indicator / performance measure	Baseline value	Comments
1. Determine and explore the current levels of KAPB; and the drivers of behaviour among: (a) DHMT and health facility staff (b) Community Medicine Distributors (CMDs)/ VHTs and (c) communities in the project region, specifically, family decision makers and parents/caretakers of children under five and pregnant women	1.1 Proportion of people who name mosquitoes as the cause of malaria	94.4%	
	1.2 Proportion of people who know the main symptom of malaria	81.4%	Mentioned fever as a common symptom of malaria unprompted. Highest mentions in Amudat and Nakapiripirit (100%); lowest in Lamwo (57%) and Kitgum (67.2%)
	1.3 Proportion of people who know preventive measures for malaria	78.0%	Mentioned use of nets as best preventive measure
	1.4 Percentage of mothers of children 0-59 months who know how malaria is transmitted	92.0%	
	1.5 Proportion of child caregivers (0-59 month old) who know two or more ways how malaria is prevented	75.9%	Considered those who could mention two or more ways unprompted. The districts where the biggest proportions of respondents could mention two or more ways were Nakapiripirit, Amudat and Kaberamaido. Those with the least were in Lango region
	1.6 Proportion of caregivers for children under five years of age with fever who sought from a recommended person within 24 hours of recognition of fever	Private health facility: 69.0% VHT: 29.0%	

Key Baseline objective (by study)	Key indicator / performance measure	Baseline value	Comments
		Private not-for-profit facility: 4.0%	
		Private clinic: 17.0%	
	1.7 Proportion of CHEWs/VHTs able to state all the key malaria management and control practices/procedures	-	No quantifiable data collected among VHTs at baseline
2 Determine and explore the barriers and facilitators of behavior change and information sources among the (a,b, c) above	2.1 Proportion of people who recall hearing or seeing any malaria message within the last six months	64.0%	
	2.2 Proportion of people who can propose avenues that promote behavior change communication	74%	Considered those who mentioned two or more ways
	2.3 Proportion of people who can identify barriers to behaviour change and information sources	33%	Considered those who mentioned 2 or more barriers
	2.4 Proportion of people who perceive they are at risk of contracting malaria	79.0%	
	2.5 Proportion of people who feel that consequences of malaria are serious	99.1%	
	2.6 Proportion of people who are confident in their ability to perform a specific malaria-related behaviour	<i>See indicators 2.6.1 and 2.6.2</i>	
	2.6.1 Proportion of people who are confident in their ability to prevent themselves from getting malaria	70.8%	
	2.6.2 Proportion of people who are confident in their ability to seek appropriate treatment if they suspect that they have malaria	89.6%	
	2.7 Proportion of people who believe that the recommended	<i>See indicators from 2.7.1 to 2.7.3</i>	

Key Baseline objective (by study)	Key indicator / performance measure	Baseline value	Comments
	practice or product will reduce their risk of getting malaria		
	2.7.1 Proportion of people who believe that sleeping under a net every night will reduce their risk of getting malaria	82.6%	
	2.7.2 Proportion of people who believe that IRS will reduce their risk of getting malaria	70.3%	
	2.7.3 Proportion of people who believe that IPT will reduce the risk of a pregnant woman getting malaria	81.8%	
	2.8 Proportion of people who recall hearing or seeing a message through communication channel 'X' (reported by each specific communication channel)	Health workers: 72.5% VHTs: 59.2% Radio: 42.6% Community meeting / Event: 16.3% Family member / neighbour / friend: 13.6% Local leader: 8.2% Religious /social gathering: 7.6% local government/ NGO extension worker: 5.9%	
	2.9 Proportion of people with a favourable attitude toward recommended malaria control interventions such as LLINs, IRS, and IPTp	LLINs - 82.6% IRS - 70.3% IPTp - 81.8%	
	2.10 Proportion of people with a favorable attitude toward	92.5%	

Key Baseline objective (by study)	Key indicator / performance measure	Baseline value	Comments
	testing for malaria before treatment		
3 Identify influential agents and channels through whom health workers and communities may be able to learn and acquire new information which could influence behaviours	4 Proportion of people who have encouraged friends or relatives to adopt recommended malaria prevention, health seeking and treatment	55.2%	
5 Assess the status of behaviour change communication (BCC) structures/ systems to strengthen for delivery and sustainability of comprehensive BCC activities focus on malaria management and control in the district	6 Proportion of individuals reached with malaria-specific or key family care practice messages through community-based initiatives with DFID support in 23 high burden districts.	0%	At baseline the SURMa project has not yet reached anybody with malaria specific messages

Conclusions

It emerges from the findings that, whereas the knowledge among caregivers that malaria is transmitted through mosquitoes is high, many respondents also believed that malaria is also caused by eating dirty or cold food and that it can also be transmitted by other insects such as bedbugs, flies and cockroaches. Such beliefs are widespread in the Karamoja districts. There are also widespread beliefs in some districts that malaria is airborne and transmitted through physical contact with an infected person. Accurate knowledge of accurate malaria prevention methods is least in the Lango region. The symptoms of malaria are widely known, except in some districts such as Lamwo and Kitgum. But the ability of caregivers to distinguish between uncomplicated and severe malaria is still inadequate.

Pregnant mothers are knowledgeable that sleeping under a mosquito net and taking IPTp during pregnancy are effective means of prevention against malaria during pregnancy, though some are not sure about the number of times they have to take IPTp. VHTs, caregivers and health workers are all comfortable with the use of rectally administered treatments such as rectal artesunate.

The use of mRDTs to confirm the presence of malaria in one's body is already widely known and supported. However, some VHTs and health workers expressed concerns about instances where mRDTs give false results or contradicted microscopy results.

Caregivers of children appreciate the role played by VHTs and prefer their services mainly due to their accessibility. The challenge of in some places stockouts of Coartem, RDT kits and other supplies, such as gloves, remains. While it was reported that most caregivers comply with the

referral advice of the VHTs, it was also noted that others hesitate to be referred for several reasons, including transport costs, long distances and the perceived poor quality of care received.

Caregivers and family decision makers expressed largely positive attitudes towards seeking care from health facilities. Some, however, expressed reluctance due to the perceived poor quality of services sometimes witnessed in public health facilities, reflected through stock outs of drugs and poor attitudes of health workers. Early care seeking for children suspected of malaria is still a challenge, with less than two thirds (61.7 percent) of the caregivers, whose children aged under five had malaria-like symptoms in the past three months, reporting that they sought treatment within 24 hours.

Four categories of influential agents were identified: cultural leaders or elders, district political leaders (Resident District Commissioner, Chairperson of the Local Council V), religious leaders, and VHTs/health workers. They are resourceful and hold positive attitudes towards malaria control interventions and should therefore be used as partners in malaria control.

Net use is high, but net care and repair appears to still be lagging, as evidenced by more than one third of nets observed having holes, and less than half of these had evidence of repair efforts. Barriers to net use include inadequate nets in households, feeling hot inside nets, itching, as well as social-cultural barriers such as the size and nature of houses and sleeping arrangements, whereby some people sleep on mats placed on floors. Misuse of nets was reported in some communities, as well as re-use of old nets. While some household heads and caregiver's express willingness to replace old nets, others expect government to give them new nets when the current ones get old.

The key drivers of caregiver behaviour in malaria control were found to include caregiver knowledge, distance to the health facility, perceptions and previous experience about the availability of drugs at health facilities, perceptions about the severity of illness, and social cultural and gender factors. On the other hand, the key drivers of behaviour among VHTs included receipt of training, availability of antimalarials and other necessary supplies, facilitation, level of motivation, and the level of contact / linkage with health facilities and partner agencies.

Other actors, such as schools, police, prisons, agriculturalists and road contractors, acknowledged how their activities contribute to the spread of malaria, and how their members are at risk of malaria. They also acknowledged the need to collaborate to help control malaria, suggesting that there is huge potential for Malaria Consortium to collaborate with these actors.

Recommendations

Based on the evaluation findings, the following key recommendations are made:

Social behaviour change

- The SURMa project will use local leaders, VHTs, health workers and political leaders as the key agents of behaviour change for malaria control.
- The SURMa project will include in its information, education, communication (IEC)/BCC campaign information about:
 - The transmission of malaria - The campaign should aim to dispel misinformation that malaria is transmitted by other insects, through the air or contact with an infected person.

- The correct ways of preventing malaria - People should be encouraged to protect themselves from mosquito bites (through LLIN use, IRS, and clearing of mosquito breeding sites) as the best way to prevent malaria.
- Recognising the danger signs of malaria and how it can be distinguished from uncomplicated malaria in order to promote appropriate and prompt care seeking.
- The recommended number of times that a pregnant mother should take IPTp.
- The need to complete the prescribed dose of antimalarials, and the dangers of not completing the dose.
- Household care of nets to make them last longer. This will include training on hanging nets, tucking them away during the day, and washing and repairing of torn nets.
- The need to change attitudes of dependency on government and inculcate a sense of willingness to replace old nets. This will entail demonstrating the benefits of replacing nets versus the costs of suffering malaria.
- The project's IEC/BCC interventions will emphasise the importance of pre-referral treatment because it is life saving and can be administered by VHTs.

RDTs

- Training of VHTs and health workers in RDT use will emphasise circumstances under which RDTs may post false results and what to do in such circumstances.

Net access

- The SURMa project will, in collaboration with the Ministry of Health (MoH), undertake focused distribution of nets in road construction camps, prisons and other similar settings in order to promote malaria prevention.

Net use

- The project will provide information and support to encourage all household members to use nets. These will include net-hanging demonstrations and support, net use monitoring, and encouragement to repair torn nets.
- More qualitative and quantitative research is needed to determine the sleeping arrangements, e.g. what is the extent of people sleeping on the floor and how does that impact net use?
- Malaria Consortium will work with other partners to explore the appropriateness of existing LLINs to those who sleep on mats placed on the floor. In case the existing nets are not suited for this sleeping arrangement, it is important to collaborate with net manufacturers to make appropriate nets that suit these contexts.

Malaria treatment and referrals

- The SURMa project in collaboration with districts will engage communities and other stakeholders in malaria control to find appropriate means of enabling communities to seek early care for suspected cases of malaria and to complete referrals.

Partnerships / multi-sectoral approach

- The SURMa project will initiate collaborations with actors in other sectors such as road construction, building construction, agriculture, brick making, schools, police and prisons to undertake joint interventions aimed at malaria prevention and control in these sectors. Such interventions should be tailored to the needs and potentials / resources available within these sectors. They may for instance include:
 - school malaria clubs in schools
 - interventions to prevent exposure to mosquito bites during night duty among armed forces
 - refill of soil excavation pits among construction and brick making workers, etc.
- The bills of quantities (BOQs) for district buildings, roads and other construction works should clearly indicate and include malaria preventive issues as for HIV/AIDS. For example, sensitising affected communities on the minimum malaria preventive package and the consequences of malaria, and requiring mandatory usage of nets by all workers on the construction sites should be clearly spelled out in the BOQs.
- The SURMa project will undertake both collaborative and advocacy activities with Districts and other responsible agencies to ensure that residential premises in institutions such as schools, police and prisons are fitted with wire mesh to prevent entry of mosquitoes.

2 INTRODUCTION AND BACKGROUND

2.1 Introduction

This report presents the findings of a baseline study on KAPB in relation to malaria control in Mid-North and Karamoja regions of Uganda. The baseline study was conducted as a sub-component of a broader baseline for the Strengthening Uganda's Response to Malaria (SURMa) project.

2.2 About Malaria Consortium

Malaria Consortium is an international organisation working primarily in Africa and Asia on communicable disease control. Malaria Consortium works closely with MoH, academic institutions and a range of partners to undertake various interventions aimed at malaria control, ranging from policy and strategy development to implementation, monitoring and evaluation and operational research. Malaria Consortium also works on the control of other communicable diseases, including tuberculosis, diarrhoea and neglected tropical diseases.

2.3 Overview of the SURMa Project

Malaria Consortium, under the guidance of National Malaria Control Programme and MoH, with funding from UK aid and in conjunction with Unicef, is implementing a five-year project 'Strengthening Uganda's Response to Malaria' in 23 districts in Mid-North and Karamoja sub regions of Uganda. The project will support the Government of Uganda to deliver cost-effective interventions to prevent and treat malaria among those most at risk, reducing malaria related illness and death. At sub-national level, the project will compliment DFID support provided through USAID to prevent malaria through IRS in five districts where the prevalence of malaria is highest. It will also expand access to high-quality life-saving treatment at community level through integrated community case management. In addition, the project will work with district health teams to support and strengthen the health system to deliver interventions at the required levels of coverage and quality to be effective. This will include support to the district leading to health system strengthening and support for health facilities to prevent, diagnose and treat malaria and conduct malaria surveillance.

The primary audiences for this project are family caregivers and (economic) decision makers within the household, and health workers, at both health facility and community level, and the DHMTs. Once commodities are available, their uptake and use will depend on behaviour change at the household and individual level. The project will use IEC to increase knowledge on issues around the new tools and commodities and BCC approaches to encourage families and health care providers to believe and act on the new knowledge. DHMTs will also be targeted for the purpose of continuous overall supervision of malaria control and management services in the districts. Therefore, during this project, their capacity and skills will be strengthened to sustain both the project's achievements and results, and to analyse, interpret and develop strategies for sustaining overall district performance.

2.4 KAPB study purpose and objectives

2.4.1 Overall purpose

The purpose of the KAPB study was to assess health provider and community perceptions towards, and practices relating to, the various interventions to be deployed through the project. The study was expected to provide key information on the context of the project to inform the planning for the project and for the development of an effective communications strategy. The results of the study should also help in triangulation of data collected concurrently under other baseline sub-components in the same project area.

2.4.2 Specific objectives and evaluation questions

1. Determine and explore the current levels of knowledge, attitude, practice and behaviour; and the drivers of behaviour among: (a) DHMT and health facility staff; (b) Community Medicine Distributors (CMDs)/VHTs; and (c) communities in the project region, specifically, family decision makers and parents/caretakers of children under 5 and pregnant women.
2. Determine and explore the barriers and facilitators of behaviour change and information sources among the (a,b, c) above
3. Identify influential agents and channels through whom health workers and communities may be able to learn and acquire new information that could influence behaviours.
4. Assess the status of BCC structures/systems to strengthen as needed for delivery and sustainability of comprehensive BCC activities focused on malaria management and control in the district
5. Make recommendations based on the findings of the formative research, which will inform the BCC strategy for the project.

2.4.3 The context

Geographical, social and political context

The SURMa project targets two sub-regions of Uganda, the Northern sub-region and the Karamoja sub-region. These two sub-regions have unique social cultural, political and health characteristics.

The Northern sub-region which consists of Lango and Acholi was, for over a decade, the site for the civil war between Ugandan Government forces and the Lord's Resistance Army led by Joseph Kony. This war devastated infrastructure, including health facilities, and undermined government efforts to provide essential services such as safe water and good roads. It also worsened the poverty situation. Since the end of the war around 2008, the region is now slowly recovering and a lot of infrastructural and social service developments have taken place.

The Lango and Acholi districts have benefitted from IRS, dating from 2009. The last round of IRS took place as recently as April-June 2018 in the districts of Ouke, Amolator, Alebtong, Dokolo and Kaberamaido, and in 2017 in districts such as Pader and Oyam.

The Karamoja sub-region is a large expanse of semi-arid territory covering seven districts in north-eastern Uganda. The area is largely remote with very poor roads and social services. Despite a number of NGOs and other development partners being present in the region, social services remain poor and access is largely constrained by long distances to sources of services. The population, which

is primarily dependent on cattle keeping, is also characterised by following a nomadic lifestyle. Additional factors are generally low levels of education and high levels of poverty.

Both sub-regions have, like the rest of the country benefited from the mass LLIN distribution that took place in 2017 to 2018. Administratively, some of the districts have recently been split to create new districts. These include Nakapiripirit district, which has been split to create Nabilatuk, and Apac split to create a new district of Kwanja effective July 1st, 2018.

The burden of malaria in the project area

Uganda is one of the 13 high burden countries for malaria and accounts for an estimated four percent and three percent of the global number of cases and deaths, respectively¹. In the project area, according to the Uganda Demographics Health Survey 2016, malaria prevalence among children 0-59 months was highest in the three sub regions: 70.5 percent (Karamoja), 62.2 percent (Acholi) and 62.8 percent (Lango) and the national target is to reduce it to seven percent. The national malaria prevalence rate for this sub population was 30.4 percent.

Associated with malaria disease is anaemia. At national level, the prevalence of anaemia among children under five years is 52.8 percent. In the same sub regions, anaemia prevalence rates in children under five years were highest compared to other sub regions of the country. According to the report, Acholi had the highest anaemia prevalence of 70.8 percent followed by Karamoja with 67.6 percent and then Lango with 61 percent.

Use of insecticide-treated mosquito nets

The use of insecticide-treated mosquito nets (ITNs) is a primary health intervention designed to reduce malaria transmission in Uganda. The average number of insecticide treated mosquito nets per household was reportedly low, below two in Mid-North and Karamoja sub regions. According to the Uganda Department of Health Statistics (UDHS) 2016 report, Lango had an average of 1.9 ITNs per household followed by Acholi with 1.7 and last Karamoja with 1.0. The desired coverage is at least one ITN per two people in the household. The percentage of children under five years that slept under an ITN the previous night was 70.9 percent for Karamoja, 78.7 percent for Lango and 80.5 percent for Acholi.

Health seeking behaviour

Health seeking simply refers to actions taken by the care giver/parent when a child seems not feeling well or shows symptoms of a disease in an attempt to get the child recover from any disease or condition.

According to UDHS 2016 report, among children under five who had symptoms of acute respiratory infection, the percentage for whom advice or treatment was sought is at 83.9 percent for Karamoja, 82.7 percent for Lango and 94.6 percent for Acholi. Also among children under five who had diarrhoea during the two weeks preceding the survey, the percentage for whom advice or treatment was sought stands at 82.9 percent for Karamoja, 84.7 percent for Lango and 77.1 percent for Acholi. Finally, among children under five who had fever in the two weeks preceding the survey, the percentage for whom advice or treatment was sought stands at 89.7 percent for Karamoja, 82.4 percent for Lango and 85.1 percent for Acholi.

¹ WHO (2016), World Malaria Report

Malaria testing for children under five years is key to eventual management of the disease. According to UDHS 2016, the percentage of under-five who had blood taken from a finger or heel for testing was at 68 percent for Karamoja, 49.3 percent for Lango and 66.8 percent for Acholi sub region. The national performance was at 49 percent.

In summary, the current coverage of malaria, childhood illness and maternal indicators still needs significant level of action in order to improve the health outcomes of children under five years. The population in these sub regions needs to know and implement the basic practices that yield better results in malaria prevention, management and reporting.

3 METHODS

3.1 Overall design and approach

The baseline study adopted a cross-sectional design by which collected data referred to a single point in time. Both quantitative and qualitative approaches were used to undertake this KAPB baseline study. The qualitative methods helped to make an in-depth exploration of the actors' perspectives, views and behaviours in relation to malaria control. It also allowed paying attention to factors at personal, social, cultural and institutional levels that are relevant to people's behaviour. The quantitative approach entailed use of a structured questionnaire to interview a sample of household respondents. The quantitative approach helped to collect quantifiable data about key indicators.

3.2 Data sources and study participants

Study participants included the following:

Parents/caregivers of children under five – The focus on this group considers their primary responsibility for the day to day welfare of children and catering for the children's needs. Caregivers are often the first to notice if a child is ill, they are the ones that bring children to seek health care, and they also have some decision-making authority such as regarding when to seek medical attention and where to seek it from.

Family decision makers/household heads in households with children under five – This study will therefore target heads of households as key decision-makers in the health-care seeking for children under five. The household head is often the key decision-maker with regard to health-care seeking for children, often also controlling financial, transport and other resources necessary for health-care seeking.

Pregnant women – Pregnant women were enrolled into this study, considering that they constitute one of the population sub-groups most at risk to the effects of malaria.

Village Health Teams– VHTs play a key role in the control of malaria at the village level, educating community members about malaria prevention, promoting use of nets, and treating children with malaria. In some of the districts covered by this study, VHTs were trained in iCCM and they are supplied with medicines and commodities such as RDTs to test and treat children with malaria, pneumonia and diarrhoea. VHTs were engaged in this study through participation in FGDs.

Health facility staff – These participants consisted of medical staff working in health facilities at different levels of Uganda's health care system; namely, regional referral hospitals, district hospitals, health centre IVs, health centre IIIs, and health centre IIs. Such staff included doctors (medical officers), clinical officers, midwives, nurses and nursing assistants. A sample these grades of health facilities was visited for this study and both key informant interviews and FGDs were conducted.

District Health Team members – These included key district health technical staff such as the District Health Officer, District Health Educator (DHE) District Nursing Officer, Malaria Focal Person (MFP) and District VHT coordinator. They were targeted for the study because they are responsible for the planning and management of all health interventions in their districts, they are responsible for supervising and supporting health service provision in both health facilities and communities, and

they are also important sources and agents of key information about diseases and their prevention and management.

Heads of other district departments relevant to malaria control – The team also collected data from Heads of District Departments such as Education, Agriculture, and Engineering because of the relevancy of their work to malaria control.

Heads of Institutions – Data was also collected from heads of institutions such as police, prisons and schools which have a big population in institutional settings. These were included because of the risk of malaria that their members could be exposed to, as well as the potential role they could play in malaria control.

Private sector enterprises/companies – These included road contractors hired by districts and brick makers. Their work involves excavating soil and creating open places where water can collect and mosquitoes breed. They were interviewed about their awareness of the risks of malaria and the potential role they could play in malaria control.

Local leaders – Local leaders included in the study consisted of Village Local Council Chairpersons and Village Secretaries for Women. These were included because of their leadership role and their influence on their communities.

Traditional healers – Traditional healers such as herbalists represent one of the sources of care for the management of common, as well as complicated, illnesses in Uganda. People often visit herbalists and other traditional therapists as the first point of contact in seeking health attention. Others may continue to use traditional therapies alongside modern medicines obtained from health facilities. Traditional healers were therefore included in this study to provide information about the extent to which they are consulted by caregivers with children suspected of malaria or with malaria-like symptoms and how they address these.

3.3 Sampling Procedures

The KAPB baseline study was conducted in 23 districts in Mid-North and Karamoja sub-regions, which make up the project area with an estimated population of about 4.7 million people.²

Quantitative survey sample

Given the focus of the project, the survey targeted households with a pregnant woman or a child under the age of five, as these are usually the main targets of malaria interventions. For the survey, we studied a sample of 2,270 caregivers of children under five and pregnant women (see Annex 1 for details of sample size estimation). Of the 2,270 sample members, 600 were pregnant mothers. Only one person was interviewed in each sampled household.

Qualitative samples

The qualitative samples consisted of participants in FGDs and key informant interviews as listed in Table 2.

² UBOS population projections, 2017

Table 2: Sample sizes and sampling methods

Type of sample by method of data collection	Category of study participants	Sample size covered	Selection Criteria
Sample for the survey	Caregivers of children under five and pregnant women	2,270	Presence of a child under five or a pregnant woman in the household. Cluster and multi-stage sampling and systematic sampling at community level
Sample for FGDs	Caregivers of children under five	23	One FGD per district
	Household decision makers	23	One FGD per district
	Pregnant mothers	23	One FGD per district
	VHTs	23	One FGD per district, alternating male and female
	Health workers	35	One FGD per HCIV where they exist; HCIII and II in 12 districts
	Local leaders	23	One FGD per district
Sample for Observations	Household care of mosquito nets	101	4 to 5 households per district
	Health workers attending to suspected cases of malaria	87	3 to 4 cases per district
	Health workers attending to ANC mothers	67	2 to 3 cases per district
Sample for key informants	DHMT members	46	2 per district
	In-charges of health facilities	35	1 – 2 per district

	Other district heads of departments	15	One in about a half of the districts
	Road Contractors	10	One in about a half of the districts
	Heads of Institutions (schools, police, prisons)	15	5 per category
	Leaders of farmer groups	1	One in districts where there was resistance to IRS
	Traditional healers	10	One in about a half of the districts

3.4 Methods of data collection

Data for the KAPB baseline was collected through household interviews, observation, in-depth interviews with key informants, and focus group discussions.

Below is an elaboration of the different methods used:

Review of documents

A review of documents was started during the planning/preparation for this baseline to allow the team to understand the project and to prepare for the task. Documents reviewed included project background and government policy documents, and published and grey literature on malaria control in Uganda and other countries. The review also included national surveys and other studies on malaria.

Household survey – interviews with caregivers

Structured interviews were conducted in order to collect data that can be used to measure the quantitative indicators in the KAPB study. Structured interviews were administered to caregivers of children under the age of five and pregnant women in the sample households. Only one interview was conducted in each sampled household. In cases where some questions required information from other household members, such as that about use of mosquito nets, the respondent was allowed to consult other household members. Interviews lasted between 30 – 45 minutes. A structured questionnaire was used.

In-depth interviews with key informants

In-depth interviews were carried out with key informants, including DHT members, other district heads of department, In-charges of district hospitals and Health Centre IVs, traditional healers, road contractors, school administrators and heads of other institutions. These interviews consisted of one-to-one unstructured answer-question interactions between a member of the research team and the interviewee. Interviews with district health officials, health facility staff and other key informants were conducted in English, while those with traditional healers were mostly done in the local languages as appropriate. Open-ended interview guides were used.

Observation

Observation as a method of data collection was used to assess the following behaviours:

a) Observation of the care for mosquito nets

To observe the care for mosquito nets, Research Assistants identified households with mosquito nets and asked for consent to look at the nets. After gaining consent, they asked to enter the sleeping room(s) and look at the mosquito net, to check whether it is folded up during the day, whether it has any open or sewn up holes, and whether there is evidence of washing in the past few months. Follow up questions were also asked about the observed nets. Net observations were conducted in a total of 101 households, covering an average of 4-5 households per district. Most households had two nets, and a total of 219 nets were observed in the 101 households.

b) Observation of health workers managing cases of children with suspected malaria

During this observation, the study team sought to assess health workers' ability to recognise danger signs and provide prompt management and care for children with severe malaria. The key behaviour of interest was whether health workers carry out appropriate diagnosis to determine the severity of malaria, and whether they recognise the symptoms of severe malaria..

An average of 3-4 cases of children with suspected malaria were observed in each district, with a total of 87 observations. Observations were conducted in a total of 45 health facilities across the 23 districts. The assigned team member, after gaining permission from health centre authorities and getting consent of the health worker, sat in the health worker's room as clients came in. Using the observation tool, the team member then watched to see if, when a case was suspected, the relevant questions were asked and tests done to confirm the presence of malaria and determine its severity. The team member also observed the immediate action taken to address the symptoms and asked about the treatment prescribed. A follow-up interview was conducted with the health worker.

c) Observation of pregnant women during their ANC visit

The aim of these observations was to assess whether pregnant women are appropriately attended to, advised about malaria prevention, and given malaria control medicine in form of IPTp.

To conduct this observation, the entry point was the health centre ANC clinic. A research assistant liaised with the health worker to gain consent and sit in the health worker's room. They observed whether key questions were asked, malaria prevention was discussed and IPTp was administered. A total of 67 observations were conducted, with an average of 2-3 per district. A follow up interview was also conducted with the health worker and pregnant woman.

Focus group discussions

FDGs were used to collect data on community/group perceptions, beliefs and behaviours and held with the following groups:

- (i) Caregivers of children under five
- (ii) Family decision makers/household heads
- (iii) Pregnant women
- (iv) VHTs
- (v) Health workers (nurses and midwives) at health facilities
- (vi) Local leaders - consisting of LC1 chairpersons and secretaries for women affairs

FGDs consisted of 8-12 participants per group. FGDs with health workers were conducted in English, while those with the rest of the sub-groups were conducted in the local languages spoken in the respective communities. Each FGD was facilitated by two members of the research team; one to moderate the discussion, and the other to record the discussion. All the discussions were digitally recorded. In addition, handwritten notes were taken to back up the recordings. FGDs lasted between one to two hours. Discussion guides (checklists of topics and questions for discussion) were used to facilitate the group discussions.

3.5 Data processing and analysis

Quantitative data

Field editing was done for each completed questionnaire immediately after the interview to ensure that it was properly and adequately completed. Further editing was done after each day's work. Open-ended questions were post-coded and all the questionnaires were entered into the computer using EpiData software. Data was then analysed using Statistical Package for Social Scientists (SPSS). Data analysis mainly consisted of descriptive and bi-variate analyses. Key variables are disaggregated by district.

Qualitative data

Data analysis was run concurrently with data gathering in a reflexive and iterative process (Marshall and Rossman, 1989). Following data collection, notes from key informant interviews (KIIs) and FGDs were transcribed, assembled and typed out. Data processing and analysis involved the key steps of familiarisation, identification of themes, data coding, assembling coded data, and interpretation. The notes were read thoroughly and coded manually. Relevant verbal citations (*quotes*) have been identified and where appropriate integrated into this report.

3.6 The Study Team

The study team consisted of district health staff, and graduate research assistants recruited to assist in collection of field data. These were trained on quantitative and qualitative data collection methods, the objectives of the study, study procedures, ethical considerations in research and the tools for data collection. They were fluent in the local languages spoken in the 23 districts. The team was divided into sub-teams for efficient conduct of fieldwork and supervision. The field team was overseen by Malaria Consortium staff.

3.7 Ethical considerations

This KAPB baseline study adhered to all relevant ethical requirements for undertaking research among human subjects. The measures taken included but were not limited to: informed consent, voluntary participation, confidentiality and anonymity, and respected the privacy of the study participants.

4 RESULTS

4.1 Introduction

This section presents the findings of the KAPB baseline and is structured around the specific objectives outlined in the terms of reference. These include: levels of knowledge about malaria control, attitudes towards malaria prevention and control, practices in relation to malaria prevention and control, and IEC/BCC structures and activities. The section, however, starts with a description of the socio-economic characteristics of the survey respondents.

4.2 Characteristics of survey respondents

A total of 2,270 respondents comprising male and female caregivers of children under five and pregnant women were interviewed during the survey. Table 3 below shows their social and demographic characteristics.

Table 3: Socio-demographic characteristics of household survey respondents

Characteristic	Percentage	Frequency (N=2270)
Sex of respondent		
Male	10.4	235
Female	89.6	2,035
Age of respondent		
16-19	8.7	198
20-29	50.7	1,150
30-39	30.0	682
40-49	7.7	174
50-59	1.5	35
60+	1.0	23
Age not stated / don't know	0.4	8
Highest level of education attained by respondent		
No formal education	20.5	466
Primary not complete	44.8	1,017
Completed primary	13.7	311
Secondary not completed	12.6	285
Completed secondary	3.5	80

Post-secondary	4.9	111
Main occupation of respondent		
Peasant farmer	71.6	1,626
Housewife	10.4	235
Business / trader	6.0	137
Skilled salaried worker	3.9	88
Skilled/semi-skilled artisanal worker	2.9	65
Casual worker	1.7	39
Unemployed	1.6	37
Student	0.2	5
Other	1.7	38
Current marital status of respondent		
Married / cohabiting	90.2	2,047
Single / never married	4.1	92
Divorced / separated	4.1	92
Widowed	1.7	39
Religious affiliation of respondent		
Roman Catholic	60.9	1,383
Anglican Protestant	27.0	614
Pentecostal	4.8	110
Born Again	4.4	100
Muslim	1.4	31
Seventh Day Adventist	0.3	7
Other	1.1	25
Total number of people who usually live in household		
1-4	35.2	800
5-8	49.9	1,132
9+	14.9	338

Number of children under five who usually live in household		
0	7.4	169
1	45.2	1,026
2	35.5	805
3+	11.9	270
Number of people aged 5+ who usually live in household		
1-4	60.4	1,372
5-8	34.3	778
9+	5.3	120

The data in Table 3 show that the majority (89.6 percent) of the survey respondents were female, compared to 10.4 percent who were male. This is expected given that females more commonly play the caregiving role for children. Moreover, the survey sample also included 635 pregnant women. Slightly over a half of the respondents (50.7 percent) were aged between 20–30, followed by those who were aged 30–39. This is also expected since these are the age groups when people are more likely to have children.

In terms of education, close to a half of the respondents (44.8 percent) had attended primary school but not completed primary seven. One fifth (20.5 percent) had no education at all. Those who some secondary schooling or beyond totalled about 21 percent. These low levels of education have implications for the kind of IEC/BCC channels that may be appropriate for reaching this audience. Peasant farming was the main reported occupation for the majority (71.6 percent) of respondents. This was followed by 10.4 percent, who reported their major occupation as being a housewife.

The majority of the respondents (90.2 percent) reported that they were married or cohabiting. This implies that the majority households have at least two adults, one of them a male. This may have implications for household decision-making about malaria control and health care seeking in general. Given that Uganda is a patriarchal society, such decisions are mostly made by the men. Roman Catholicism was found to be the dominant religion followed by Anglican Protestantism. In terms of household size, most respondents reported between five to eight people in the household, with 45.2 percent reporting one child under five in the household.

4.3 Levels of knowledge about malaria

One of the objectives of this KAPB baseline included determining the current levels of knowledge about malaria and malaria control among different actor groups, including caregivers of children under five, family decision makers and VHTs. This sub-section of the report reports the findings about knowledge levels of these different groups.

4.3.1 Levels of knowledge about malaria among caregivers of children under five

Caregivers and family decision-makers' knowledge about causes and transmission of Malaria

Having accurate knowledge about the cause of malaria is essential if people are to protect themselves and their family members effectively from malaria. In this study we asked survey respondents what they thought caused malaria. Table 5 shows the results by district.

Table 4: Reported causes of malaria

District	Mosquito bites	Dirty environment /poor sanitation & hygiene	Cold /changes in weather	Eating cold food	Eating dirty food	Drinking dirty/ unboiled water	Getting soaked with rain	Eating maize/ mangoes /sugar cane	Don't Know	Other	Number
ABIM	85.7%	30.6%	40.8%	12.2%	16.3%	10.2%	2.0%	.0%	.0%	10.2%	49
AGAGO	94.1%	37.0%	14.3%	5.0%	8.4%	12.6%	.8%	.0%	1.7%	6.7%	119
ALEBTONG	96.0%	30.6%	29.8%	8.1%	4.8%	4.0%	1.6%	.0%	.0%	4.0%	124
AMOLATAR	93.4%	6.6%	7.9%	.0%	2.6%	1.3%	3.9%	1.3%	.0%	.0%	76
AMUDAT	100.0%	43.8%	16.7%	14.6%	14.6%	4.2%	14.6%	2.1%	.0%	2.1%	48
AMURU	95.0%	11.0%	20.0%	4.0%	4.0%	3.0%	2.0%	1.0%	.0%	1.0%	100
APAC	91.4%	35.0%	42.1%	5.6%	9.6%	3.6%	6.1%	3.0%	1.5%	4.6%	197
DOKOLO	97.9%	11.5%	28.1%	5.2%	2.1%	1.0%	2.1%	1.0%	1.0%	2.1%	96
GULU	93.9%	34.5%	20.9%	4.1%	6.1%	4.7%	2.0%	.7%	2.0%	8.8%	148
KAABONG	92.6%	45.7%	32.1%	16.0%	29.6%	6.2%	7.4%	2.5%	1.2%	19.8%	81
KABERA-MAIDO	99.0%	3.8%	8.7%	1.9%	1.0%	2.9%	.0%	.0%	.0%	.0%	104
KITGUM	93.9%	21.9%	31.6%	15.8%	15.8%	16.7%	14.9%	6.1%	4.4%	8.7%	114
KOLE	97.7%	19.8%	45.8%	5.3%	7.6%	3.8%	.8%	.0%	.0%	5.3%	131
KOTIDO	76.1%	53.5%	35.2%	32.4%	29.6%	5.6%	4.2%	.0%	4.2%	21.1%	71
LAMWO	97.5%	31.6%	22.8%	13.9%	6.3%	3.8%	5.1%	2.5%	.0%	25.3%	79
MOROTO	100.0%	83.6%	38.2%	60.0%	58.2%	5.5%	9.1%	1.8%	.0%	.0%	55
NAKAPIRI-PIRIT	97.3%	42.5%	9.6%	13.7%	6.8%	8.2%	13.7%	6.8%	.0%	4.1%	73

NAPAK	91.0%	80.6%	34.3%	62.7%	34.3%	4.5%	4.5%	.0%	.0%	.0%	67
NWOYA	93.1%	27.8%	37.5%	5.6%	9.7%	1.4%	1.4%	.0%	1.4%	6.9%	72
OMORO	94.0%	12.0%	25.3%	7.2%	4.8%	2.4%	6.0%	2.4%	1.2%	2.4%	83
OTUKE	96.6%	10.2%	33.9%	3.4%	5.1%	1.7%	1.7%	1.7%	1.7%	15.3%	59
OYAM	97.7%	19.7%	20.7%	5.6%	4.2%	8.9%	2.3%	1.4%	.0%	1.9%	213
PADER	91.1%	31.1%	20.0%	8.9%	3.3%	5.6%	4.4%	4.4%	4.4%	10.0%	90
Total	94.4%	29.2%	26.9%	10.9%	10.3%	5.6%	4.4%	1.7%	1.1%	6.4%	
Number*	2,123	657	604	246	232	125	98	38	25	144	2,249

* Multiple response allowed

The data in Table 4 show that a big majority (94.4 percent) of the survey respondents knew that malaria is caused by mosquito bites. The mention of mosquito bites as a cause of malaria was highest in the districts of Amudat and Moroto, where all (100 percent) of the respondents mentioned mosquito bites as a cause of malaria.

Up to 29.2 percent reported that malaria is caused by living in a dirty environment characterised by poor sanitation and hygiene, while 26.9 percent reported exposure to the cold or changes in weather conditions. These two reported causes, though not a direct cause of malaria, could be associated with malaria since they might be linked to the breeding of mosquitoes. However, there were respondents who reported causes that are not linked to malaria, such as eating cold food (10.9 percent), eating dirty food (10.3 percent), drinking unboiled water (5.6 percent), and getting soaked by rain (4.4 percent). Eating foodstuffs such as maize, mangoes and sugar cane were also regarded by 1.7 percent of the respondents as a cause of malaria. Eating cold food and dirty were most mentioned as a cause of malaria in the districts of Napak, Moroto, Kaabong and Kotido. It is surprising that in a district like Moroto, there is a very high knowledge of mosquito bites as a cause of malaria, but this knowledge co-exists with the false belief that malaria can also be caused by eating dirty and cold food. These results suggest that there is need to further efforts to provide accurate information about how malaria is caused. Only when people know the correct cause will they be able to effectively control malaria.

The survey data is also corroborated by the data from the FGDs with caregivers of children under five and family household head, which equally shows that almost all caregivers knew that malaria is caused by mosquito bites. Whereas most caregivers knew the cause of malaria as any mosquito bites, a few specifically pointed out that it's a female mosquito bite that causes malaria.

“Another common disease here is malaria of the mosquito and the thing which causes it is the female mosquito which bites someone if they don't sleep in a mosquito net” (FGD Caregivers, Amudat District).

“Malaria is caused by the mosquito bites, which is brought about if we don’t sleep under mosquito nets. Also when we leave the grass to grow around our houses and mosquitoes end up breeding in those places” (FGD household heads, Lokopo Sub County, Napak District).

“When a female anopheles’ mosquito bites you, you suffer from malaria” (FGD Caregivers Bobi, Sub County, Omoro District).

“When you don’t hang your net properly on the bed, mosquitos can enter and spread malaria to you and your other household members” (FGD Caregivers, Lokopo Sub County, Napak District).

However, specific in Amolator district, there was also belief that malaria is caused by eating cold mangoes and cold food in the morning. Similarly, there were some HH heads particularly in Gulu district who associated malaria with cold weather, eating dirty food and living in a dirty environment.

“Malaria is also caused by coldness, eating dirty food and living in a dirty environment”, (FGD household heads, Patiko Sub county, Gulu District).

We also asked the survey respondents how malaria is transmitted. The results are shown in Table 5.

Table 5: Proportion of caregivers of children under five who know how malaria is transmitted

District	Mosquito bites	Other insects	Others	Don’t know	Number
ABIM	69%	9%	38%	4%	54
AGAGO	87%	16%	25%	6%	111
ALEBTONG	100%	5%	5%	0%	97
AMOLATAR	100%	2%	2%	0%	57
AMUDAT	100%	28%	0%	0%	60
AMURU	99%	1%	1%	0%	86
APAC	87%	12%	10%	7%	190
DOKOLO	96%	0%	0%	4%	79

GULU	92%	3%	10%	3%	130
KAABONG	82%	22%	53%	0%	116
KABERAMAIDO	100%	4%	0%	0%	88
KITGUM	92%	66%	5%	2%	170
KOLE	96%	3%	5%	2%	114
KOTIDO	77%	19%	42%	3%	88
LAMWO	96%	14%	10%	1%	86
MOROTO	100%	64%	0%	0%	74
NAKAPIRIPIT	98%	35%	2%	0%	85
NAPAK	95%	28%	3%	0%	76
NWOYA	97%	10%	3%	3%	67
OMORO	91%	0%	2%	6%	67
OTUKE	87%	2%	23%	4%	55
OYAM	91%	2%	4%	8%	179
PADER	89%	40%	5%	4%	110
Total	92%	15%	10%	3%	
Number	1718	282	181	58	2239*

* Multiple responses allowed

**Note that this table excludes other respondents, e.g. pregnant women who were not caregivers of children under five

Overall, 92 percent of the caregivers of children under five accurately knew that malaria is transmitted through mosquito bites. However, 15 percent believed malaria can be transmitted by other insects such as cockroaches, bedbugs and flies, while 10 percent mentioned other ways of transmission. The mention of mosquitoes as the route through which malaria is transmitted was most mentioned in Alebtong, Amolator, Amudat, Kaberamaido, and Moroto, where all (100 percent) of the respondents mentioned mosquito bites as the way through which malaria is transmitted. The least mention of mosquitoes as ways of transmitting malaria was in Abim (69 percent). It is worth noting that in some districts such as Moroto, Nakapiripit, Napak, Pader, Amudat and Kitgum, although the mention of mosquito bites as a means of transmission was high, respondents also mentioned other insects and other ways which they thought transmit malaria.

Further, in some districts such as Abim, Agago, Kaabong and Kotido, there were a big number of respondents who reported that malaria is airborne, transmitted through breath: through contact with an infected person and through a dirty environment. This calls for dissemination of accurate information in these districts about how malaria is transmitted.

Caregivers' knowledge about symptoms of uncomplicated and complicated/severe malaria

Annex T1 shows the proportion of survey respondents who could spontaneously (without prompting) mention the common symptoms of uncomplicated malaria. The most commonly mentioned symptoms were fever (81.4 percent), nausea and vomiting (63.4 percent), headache (37.2 percent) and pale eyes (36.9 percent) in that order. Others mentioned included feeling cold, diarrhoea, loss of appetite, general weakness, joint pains and dizziness. It is important to note that the biggest proportion of respondents could mention fever, the most common symptom of malaria. Fever was mentioned as a common symptom of uncomplicated malaria by all (100 percent) of respondents in Nakapiripirit and Amudat, 98.2 percent in Moroto, and 94 percent in Napak. All these three districts are in the Karamoja region. The high knowledge levels among caregivers about the symptoms of uncomplicated malaria in the Karamoja region can partly be attributed to the iCCM programme being implemented in this sub-region. The lowest mentions of fever as a symptom of malaria were in Lamwo (57 percent) and Kitgum (67.2 percent).

Data from FGDs with caregivers and household heads also shows that whereas they knew about many symptoms of malaria, high body temperature/hot body emerged as the most known symptom by almost all caregivers of children below five years. Almost all the participants in the FGDs associated high body temperature with malaria, even though this manifestation could also be for other infections such as boils and flu.

"For me, I can tell that the child has malaria if there is high temperature" (FGD Caregivers, Lakopo Sub County, Napak District).

"When the body temperature is not normal probably higher than usual then you will suspect that a child has malaria" (FGD household heads, Atiak Town Council, Amuru District).

"When you touch the child, you find that the body is very hot and when we see such a sign, we know that it might be malaria disturbing my child" (FGD caregivers, Amudat District).

Other signs and symptoms of malaria mentioned by caregivers in FGDs were headache, vomiting, shivering, loss of appetite, stomach ache and diarrhoea.

Survey respondents were also asked to mention some of the signs and symptoms of severe malaria. Some of the caregivers and family decision makers were able to mention the signs of severe malaria including loss of energy, paleness and convulsions.

... you see a child with a very high fever ... and you realise a child's eyes have turned and s/he cannot move them ... the child has no energy (FGD caregivers, Namakora Sub-county, Kitgum District).

A child starts being restless ... also a child starts convulsing (male caregivers, Bobi Sub-county, Omoro District).

“There is another type of malaria that presents with convulsions and, to this severe malaria, children always succumb. They do not survive; they usually die. This type of malaria even the VHT cannot handle. You have to rush the child to the main hospital direct to Kalongo to get admission so that they quickly put in an IV”, (FGD family decision makers, Wol Sub-county, Agago District).

Most caregivers who participated in FGDs could not differentiate between the signs and symptoms of uncomplicated and severe malaria. There is therefore need to educate people about how to make that distinction.

Caregivers’ knowledge about the diagnosis of malaria

Using RDTs as a means of confirming the presence of malaria was widely known, with 85 percent of the survey respondents mentioning this technique. Only 14 percent of the respondents mentioned testing with microscopy as a means of confirming the presence of malaria parasites. This could be attributed to the recent wide use of RDTs by VHTs as well as facility-based health workers in the diagnosis of malaria.

In FGDs, most caregivers knew that VHTs and health workers first administer a test to confirm malaria before treatment is prescribed. They knew about the RDT for malaria and many have seen it being used by VHTs or health workers administering it to their children.

“I know the RDT. It is used to test malaria so that the VHT can tell you if child has malaria or not”, (FGD caregivers, Oyam Town Council, Oyam District).

“I have seen it being used by the health workers and VHTs to test children for malaria when they are sick. And I witnessed when the VHT used it to test my child when he was sick”, (FGD caregivers, Lokopo Sub-county, Napak District).

Caregivers and family decision-makers’ knowledge about the appropriate treatment for malaria

Across all districts, almost all survey respondents reported that malaria is better treated with western medicines rather than herbal treatments. The overall proportion of respondents reporting this was 98.4 percent. Most caregivers and family decision makers knew that Coartem is the recommended first line treatment drugs for malaria. They mentioned Coartem and Panadol (brand name paracetamol) as the drugs used to treat uncomplicated malaria.

“We know it is Coartem and Panadol because that is what they give us. They give instructions, like for Coartem give in the morning and evening and for Panadol it’s three

times a day - in the morning, after lunch and in the evening” (FGD caregivers, Nadunget Sub County, Moroto District).

“There is this medicine called Coartem which is given by the VHTs to our children. It is really good and our children get better” (FGD household heads, Kaabong District).

This high level of knowledge about the appropriate treatment for malaria could be partly because Coartem is available at community level with VHTs in most communities who often are the first point of contact when children are suspected of malaria. Caregivers are therefore often told the drug that has given to their children in case the RDT turns out positive.

Caregivers were appreciative of Coartem as an effective drug for uncomplicated malaria in both children and adults.

“We give Coartem to the child who has malaria and this one is the best medicine so far for the malaria which has just started because in just three days the child is back to normal condition” (FGD caregivers, Amudat Sub County, Amudat District).

While many caregivers and family heads across several districts knew about Coartem and Panadol for uncomplicated malaria, there were some who reported that sometimes when malaria is severe, quinine injection and artesunate are the most effective drugs.

“Coartem is given if the malaria is uncomplicated, but normally my child and other children are given a drip, artesunate and other drugs if the malaria is severe” (FGD caregivers, Bobi Sub-county, Omoro District).

Caregivers and family decision makers’ knowledge about the prevention of malaria

Caregivers who participated in the survey were asked what they thought were the best ways to prevent malaria. Table 6 below shows the responses.

Table 6: Reported best ways to prevent malaria

District	Sleeping under a mosquito net	Slashing bushes/ grass around the home	Deny mosquitoes breeding grounds	Sleep under an LLIN	IRS	Close windows /doors early	Take preventive medicine	Other	Don't know

ABIM	83.7%	38.8%	24.5%	30.6%	4.1%	10.2%	8.2%	22.9%	.0%
AGAGO	83.2%	54.6%	34.5%	27.7%	7.6%	6.7%	5.0%	10.4%	.8%
ALEBTONG	79.8%	42.7%	30.6%	58.9%	46.0 %	5.6%	10.5%	9.2%	.0%
AMOLATAR	60.5%	25.0%	22.4%	55.3%	57.9 %	3.9%	5.3%	6.8%	.0%
AMUDAT	79.2%	91.7%	77.1%	39.6%	.0%	39.6%	39.6%	2.2%	.0%
AMURU	83.0%	66.0%	52.0%	44.0%	16.0 %	16.0%	10.0%	18.8%	.0%
APAC	66.0%	60.4%	42.6%	36.0%	29.4 %	11.2%	9.6%	21.7%	.5%
DOKOLO	99.0%	46.9%	27.1%	3.1%	19.8 %	3.1%	1.0%	8.6%	.0%
Gulu	75.7%	62.8%	52.7%	30.4%	19.6 %	26.4%	8.1%	10.8%	.7%
KAABONG	58.0%	60.5%	25.9%	54.3%	1.2%	19.8%	27.2%	43.1%	2.5%
KABERA-MAIDO	81.7%	34.6%	26.0%	46.2%	65.4 %	8.7%	9.6%	4.0%	1.0%
KITGUM	86.2%	57.4%	51.7%	62.1%	25.9 %	18.3%	8.8%	7.3%	.0%
KOLE	74.8%	53.4%	38.2%	29.0%	26.7 %	6.1%	5.3%	21.8%	.0%
KOTIDO	59.2%	62.0%	22.5%	47.9%	1.4%	8.5%	16.9%	38.6%	2.8%
LAMWO	96.2%	40.5%	44.3%	12.7%	12.7 %	8.9%	6.3%	8.3%	1.3%
MOROTO	47.3%	76.4%	49.1%	58.2%	14.5 %	10.9%	36.4%	5.5%	.0%
NAKAPI-RIPIRIT	74.0%	71.2%	50.7%	37.0%	5.5%	39.7%	34.2%	2.9%	1.4%

NAPAK	59.7%	73.1%	44.8%	46.3%	3.0%	26.9%	14.9%	5.2%	1.5%
NWOYA	59.7%	66.7%	52.8%	36.1%	15.3%	5.6%	6.9%	18.5%	1.4%
OMORO	92.8%	60.2%	50.6%	30.1%	24.1%	20.5%	9.6%	18.8%	.0%
OTUKE	89.8%	50.8%	42.4%	23.7%	44.1%	15.3%	10.2%	19.6%	1.7%
OYAM	89.7%	39.0%	23.9%	9.9%	20.2%	8.5%	15.0%	4.8%	.9%
PADER	88.9%	53.3%	50.0%	52.2%	17.8%	15.6%	.0%	16.9%	1.1%
TOTAL	78.0%	54.3%	39.5%	36.2%	22.6%	13.5%	11.6%	13.6%	.7%
NUMBER	1,755	1,222	889	814	509	304	260	286	16

As can be seen from Table 6, the most mentioned ways of preventing malaria were sleeping under a net (78 percent), slashing/clearing bushes and grass around the home (54.3 percent), and denying mosquitoes breeding grounds (39.5 percent) in that order. More than one third of the caregivers (36.2 percent) also specifically mentioned sleeping under an insecticide treated mosquito net. IRS was mentioned by 22.6 percent of the respondents. Use of insecticide treated nets was most mentioned in the districts of Kitgum, Alebtong, Amolator, Kaabong, Moroto and Pader. On the other hand, IRS as a preventive measure against malaria was most mentioned in the districts of Kaberamaido, Alebtong and Amolator. Up to 75.9 percent of the respondents could mention two or more correct ways of preventing malaria. Overall, therefore, the majority of the respondents knew the correct ways of preventing malaria. The districts where the biggest proportions of respondents could mention two or more ways of preventing malaria were Amudat (93.6 percent), Nakapiripirit (84.1 percent) and Kaberamaido (91.8 percent). The districts with the lowest number of respondents that could mention two or more ways were in Lango region, namely, Dokolo (53.2 percent), Oyam (56.1 percent), Kole (69.4 percent), Agago (66.3 percent) and Abim (60 percent).

It should however be noted that the responses in the category “others” included some misinformation, for instance those who reported that malaria can be prevented through washing hands, avoiding coldness, maintaining personal hygiene and cleanliness, drinking safe water or not eating raw mangoes. Such responses were common in the districts of Abim, Amuru, Apac, Kole, Kaabong and Kotido.

The quantitative findings above are also in line with those from the FGDs. Given that most caregivers knew that the cause of malaria is mosquito bites, when asked about how they can prevent themselves from malaria, most caregivers reported avoiding any mosquito bites. Most caregivers

rightly knew that sleeping under a mosquito net was one sure way to prevent malaria. Awareness about malaria prevention among family decision makers was also found to be fairly high.

“The way I prevent malaria is by making all my children and people at home to sleep under mosquito nets all the time. Even when a visitor comes to my home, I also make sure that he or she sleeps under a mosquito net” (FGD caregivers, Kotido District).

“Sleeping under a mosquito net prevents mosquito bites but also recently we agreed to have our houses sprayed with insecticides to kill the mosquitoes. It is also important to slash the grass and bushes around our houses to deny mosquitoes a chance to hide there, and so is draining all stagnant water in our compounds”, (FGD household heads, Ogwete Sub-county, Otuke District).

Besides the use of mosquito nets, caregivers and family heads also mentioned IRS, clearing all bushes around the house and draining all stagnant water to deny mosquito breeding grounds, and closing windows and doors early to prevent entry of mosquitoes into the house. Family heads also mentioned spraying inside the house with insecticides sold in shops and supermarkets.

“Clearing mosquito breeding places and closing doors and windows early enough” (FGD caregivers, Laroo Division, Gulu District).

“Removing all containers around the house to get rid of mosquito breeding places” (FGD caregivers, Bobi Sub County, Omoro District).

“We also prevent malaria by avoiding having stagnant water in the compound since the stagnant water attracts mosquitoes, and slashing the grass around the house to avoid mosquito breeding places” (FGD caregivers, Lakopo Sub County, Nepak District).

The above findings indicate that some community members are aware of the dual protection offered by LLINs and IRS. In some districts such of Karamoja region, caregivers also noted the planting of a grass called “Lothiru” helps to chase away mosquitoes from the compound.

4.3.2 Levels of knowledge about malaria among pregnant women

Pregnant mothers’ knowledge about causes, transmission and prevention of malaria

Pregnant mothers who participated in FGDs largely knew the causes and transmission of malaria. Mosquitoes were mentioned as the means by which malaria is transmitted from one person to another. Like other targeted groups of this survey, pregnant mothers demonstrated high knowledge

about malaria prevention. They knew that the sleeping under a mosquito net, as well as taking Fansidar during pregnancy are effective means against malaria during pregnancy.

...the nurse advises us to sleep under mosquito nets and we have experienced that when you are pregnant and you refuse to sleep under the net you become sick and sometimes the sickness during the pregnancy can cause abortion or low birth weight of the child during delivery (FGD, pregnant mothers, Loroo Parish, Amudat District).

“We are also given Fansidar to take whenever we come for antenatal visits and this helps to prevent malaria” (FGD pregnant mothers Myene Sub-county, Oyam District).

Even before prompting about malaria control, pregnant mothers in most FGDs easily mentioned sleeping under a net to avoid malaria when asked what they do to have a safe pregnancy. They also knew that for mosquito nets to be effective in the prevention of malaria, they must be used consistently.

“You have to use it (a net) all nights to keep safe from malaria”, (FGD pregnant mothers, Bobi Sub-county, Omoro District).

Pregnant mothers also knew that everyone in the household needs to use a mosquito net to guard against malaria.

“Everyone must sleep under the net because malaria affects everybody not only children or pregnant women” (FGD pregnant mothers, Amuru Sub-county, Amuru District).

While pregnant mothers knew about IPTp and its importance, some were not sure about the number of times they have to take it during a pregnancy.

“The number of times you go for ANC is the number of times you take it” (FGD pregnant mothers, Oyam Town Council, Oyam District).

“I went once for ANC and was given Fansidar but I don’t know how many times I should take it” (FGD pregnant mothers, Bobi Sub-county, Omoro).

“For Fansidar, one should take it during each antenatal visit at the health facility and they normally give for four times per pregnancy” (FGD pregnant mothers, Lokopo Sub-county, Napak District).

Besides the use of mosquito nets and Fansidar, pregnant mothers also knew other preventive actions. These included denying mosquito any breeding grounds in their compounds, closing windows and doors early enough and spraying with insecticides. In Karamoja region, they also mentioned smoking the house with local herbs.

“Another way that I can prevent myself and my family members from getting malaria is by keeping my home always clean and slashing the grass around the compound and clearing the stagnant waters around my house. I also ensure that the doors and the windows of my house are closed early in the evening so as to prevent the mosquitoes from entering my house” (FGD pregnant mothers, Lokopo Sub-county, Napak District).

“Your house should be sprayed to kill and scare away mosquitoes that would later bite in the night and infect you with malaria” (FGD pregnant mothers Amuru Sub-county, Amuru District).

“Any pot or container that holds rain water near the home should be broken because it will attract mosquitoes. Bushes around - slash them down. And things you use should be clean starting from your room up to your compound” (FGD pregnant mothers, Wol Sub-county, Agago District).

Pregnant Mothers Knowledge about the dangers of malaria during pregnancy

Pregnant mothers who participated in FGDs were well aware of the danger of getting malaria while pregnant. They talked about the risk of miscarriage or premature births, anaemia, persistent weakness, delivering an underweight baby, and even death as some of the dangers of malaria in pregnancy.

The most dangerous thing about getting malaria when you are pregnant is that you can easily have a miscarriage and you can easily lose the womb if not managed well by the health workers, and it can easily cause death. ...Also when you get malaria when you are pregnant you can even lose the blood from the body and become anaemic and yet it is the same blood that should assist your child in the womb and you can easily die if not managed well. I think another issue is that you can even give birth to a premature baby which is very bad because this premature child can die any time (FGD pregnant mothers, Lokopo Sub-county, Napak District).

Some pregnant mothers gave testimonies of how they had had premature deliveries and miscarriages due to malaria during pregnancy.

In my first pregnancy it [malaria] caused an abortion and when I was taken in the health facility I was given a drip;

...For me I had was at risk of abortion;

In my last pregnancy it caused yellowish water to come out of the birth canal and I gave birth before nine months;

My previous baby I gave birth while on a malaria drip and I bled, almost dying, and I was given blood as well as the baby;

[If you have malaria] the baby you have is very sickly and malaria will be its sickness for life (FGD, pregnant mothers, Kotido District).

Overall, the findings show that across all districts, pregnant mothers knew the dangers of malaria in pregnancy and took them seriously.

Pregnant mothers' knowledge about ways of managing malaria during pregnancy

Most pregnant mothers reported that the best way to manage malaria in pregnancy is to seek medical attention from qualified health workers, rather than self-medicating at home. Asked what would be the first thing they would do if they thought they had malaria while pregnant, FGD participants had this to say:

P2: For us when we are pregnant we do not take drugs and the only thing one does is to organise and go to the health facility. But in case you have headache and fever we only take Panadol;

P10: Fever is always it's a very bad sign during pregnancy ... I always advise other women that if you complain about fever to go to the health facility immediately (FGD, pregnant women, Loroo Parish, Amudat District).

P1: There is nothing much I can do, apart from going to facility [where] they test my blood for malaria. If I am positive they start treating me for malaria and I follow the doctor's advice (FGD pregnant women, Wol Sub-county, Agago District).

To tell the truth, malaria in pregnancy is not like other times, you have to act faster. You should know two people are the ones suffering and you are the one dying first (FGD pregnant mothers, Kotido District).

Pregnant mothers in particular were more likely to seek prompt care in case of malaria because it affects not only them but their unborn babies as well.

4.3.3 Levels of knowledge about malaria among village health team (VHT) members

For some time now in Uganda, VHTs have been central in the health care delivery and exist in almost every village in Uganda. As per the current MoH health policy, VHTs are the first level of health service delivery. Their activities range from advising communities on health care seeking and general hygiene to treatment of some of the common childhood illnesses including malaria especially among children under five years.

Overall, VHTs exhibited high knowledge levels about malaria. They knew it as the main cause of both morbidity and mortality especially among the under-fives. They appreciated that one of their key roles was address the malaria problem at community level in terms of diagnosis and treatment of uncomplicated malaria cases and referring children with severe malaria and other conditions to the nearest health facilities for proper management.

VHTs' knowledge of the causes of malaria

All the VHTs interviewed during this survey knew the cause of malaria as mosquito bites. Some even singled out that it is the female mosquito.

"For malaria it is a mosquito, female precisely and causes malaria once it has bitten a person with malaria, it is able to transmit it to another person whom it bites" (FGD VHTs Padibe Sub-county, Lamwo District).

VHTs' knowledge of the signs and symptoms of malaria

Similarly, VHTs knew the symptoms of malaria as: a high fever/hot body/shivering, headache, dizziness, loss of appetite, vomiting and convulsions, among others.

"You get the child feeling cold all the time. The child wants to be under sunshine all the time" (FGD VHTs Kapedo sub-county, Kaabong District).

"For me if there is headache, shivering, vomiting then I suspect malaria" (FGD VHTs Lalogi Sub-county, Omoro District).

"Another very common sign is very high temperature among the young children and also you find that the child feels very cold, shivering even when the day is hot" (FGD VHTs, Kakomongole Sub-county, Nakapripiti District).

VHTs' knowledge of the danger signs of malaria

VHTs across all districts noted that vomiting and convulsions are danger signs of malaria and reported that children with such complications are not supposed to be handled by VHTs but instead

should immediately be referred to the nearest health facility. They further noted that children with these symptoms are only given first aid / dose when drugs are available and immediately referred to the nearest health facility for appropriate management.

“If the child gets convulsion, we cannot handle such cases. We refer straight away. Children who vomit everything all the time and are not breast-feeding nor eating anything, we refer the child right away” (FGD VHTs, Patiko Sub-county, Gulu District).

“Sometimes when the child begins to collapse and the eyes turn yellow and sunken, you notice that child really has no blood in the body. For such a case, we cannot even touch. The best we can do is to give some pain-killers and quickly refer to the nearest health facility for appropriate management” (FGD VHTs, Kakomongole Sub-county, Nakapripiti District).

VHTs’ knowledge of the appropriate treatment for malaria

All VHTs knew the treatment for uncomplicated malaria as Coartem accompanied by Panadol to relieve the fever. Certainly, this is no surprise given that VHTs were trained and given this drug to treat uncomplicated malaria in their villages.

...we were trained on how to give these children Coartem, the dose depending on body weight. They also told us if we fail to handle any disease at community level, we should always refer;

R7: *We were told that coartem is the first line to treat malaria, if you see no changes, you make refferals (FGD VHTs, Olum XXX, Otuke District).*

Malaria is treated ...with Coartem, once tested positive with RDT (FGD VHTs, Ogom Sub-county, Pader District).

VHTs also emphasised that the treatment for malaria should only be given if the presence of malaria has been confirmed through testing with an RDT. VHTs also knew that for severe or complicated malaria, they are not supposed to treat, but to refer to a health facility for appropriate management.

VHTs’ knowledge about pre-referral treatment

As noted earlier, VHTs were trained under the iCCM programme to offer pre-referral treatment to children under five. VHTs therefore have knowledge about the use of rectal artesunate on a child suspected of severe malaria at community level before referral.

“We know about it [rectal artesunate] as the treatment a patient first gets before being taken to the health facility and it is given to mostly children and of course it is we the VHTs who are in charge of this treatment” (FGD VHTs, Kakamongole Sub-county, Nakapripiti District).

Some VHTs acknowledged that they knew about rectal artesunate because they were trained on using it, although it was never given to them to administer.

“We were trained on how to use rectal artesunate on children with severe malaria but it was not given to us for use. I think it was not stocked ... we were supposed to insert it in the rectum of a severely ill child with malaria and then write a referral form” (FGD VHTs Oyam District).

VHTs’ knowledge of malaria prevention

VHTs were trained not only to treat and manage malaria related cases, especially among children under five, but also to play a key role in educating caregivers and the rest of the community about malaria prevention among other diseases. Discussion revealed that indeed VHTs appreciate the key strategies of consistent use of mosquito mosquito nets and IRS, and ensuring environmental hygiene and sanitation around households to deny mosquitos breeding grounds in malaria prevention.

We normally advise the community to sleep under treated mosquitoes nets, drain stagnant water around home, clear bushes around home in order to prevent malaria (FGD VHTs, Amida Sub-county, Kitgum District).

The high knowledge levels about malaria among VHTs could be attributed to their training. VHTs acknowledged having undergone/attended some trainings organised by the MoH in partnership with the respective districts and the various partners including PACE, NUMAT, Nu-hites and Sustain for Acholi and Lango sub-regions, and Unicef, International Rescue Committee and Mercy Corps for Karamoja sub-region.

“We got training from PACE. We learnt how to treat malaria using Coartem and also pneumonia using amoxicillin tablets. This was in August 2017” (FGD VHTs, Lalogi Sub-county, Omoro District).

“We were trained by some health facility staff and some implementing partners like Nu-hites, PACE Uganda and Sustain” (FGD VHTs, Otuke District).

While VHTs acknowledged having received training, they felt it had been a long time ago and proposed refresher trainings to enhance their knowledge about malaria management and prevention.

“We had training on this kind of treatment and that was around three years ago in our first days of being VHTs. Now ... the district has never organised any other major training for us on how to best treat these common diseases, and as a human being, you can easily forget some things...” (FGD VHTs, Kakomongole Nakapiripirit District).

Similar sentiments were expressed by VHTs from other districts such as Gulu and Amolator.

VHTs’ Knowledge about testing for malaria using RDTs

In a bid to promote the test and treat policy in Uganda, the MoH with partners trained some VHTs in use of mRDTs. This survey noted for most of Acholi and Lango sub-regions, the training of VHTs in mRDTs was undertaken last year (2017) and was supported by various partner agencies including PACE, NUMAT, Nu-hites and SUSTAIN, while in Karamoja sub-region, VHTs activities were supported by Unicef, International Rescue Committee and Mercy Corps among others. All VHTs acknowledged having seen mRDTs and to know how to use it, having received training in its use.

“We have all seen it (mRDT kit) and used it because we underwent a training on how to use it” (FGD VHTs, Lalogi HV IV, Omoro District).

“We know how to use RDT to test for malaria very well and before the test, you do not give the child any malaria drug” (FGD VHTs, Oyam Town Council, Oyam. District).

“We have got knowledge. We get a blood sample from child suspected of having malaria and drop it on the RDT then we drop the buffer. When there are two lines, it shows that the person is malaria positive” (FGD VHTs, Atiak Town Council, Amuru District).

However, some of the VHTs expressed the need to be trained further on how to dispose of used RDTs.

VHT’s knowledge about when to refer a child

VHTs are trained to offer treatment for uncomplicated malaria and not severe malaria. VHTs who participated in FGDs demonstrated awareness about at what point they should make referrals.

***P7:** When a child has a difficulty in breathing, such cases cannot be handled by me so I just refer such a child to a more qualified medical personnel for better treatment*

P1: *When the child is very sick with a severe disease whereby he doesn't eat or breastfeed, I will have no option but to refer the child to a hospital*

P3: *When I get a child is shivering and fainting then such cases are really bad so they are just referred. Similarly, when the child is sweating profusely and can't talk but only crying (FGD VHTs, Kapedo Sub-county, Kaabong District).*

R2: *For me, I can know through danger signs for example if it is high fever, it could also be convulsions, vomiting everything they have eaten, that is a danger sign*

R3: *It might be that a child's condition could have failed to improve despite your earlier attempts to treat it, so that is when you can know that it is a referral case (FGD VHTs, Alerek Sub-county, Abim District).*

4.4 Attitudes towards malaria prevention, diagnosis and treatment

4.4.1 Attitudes among caregivers of children under five and family decision-makers

Attitudes of caregivers and family decision-makers towards the use of mosquito nets in the prevention of malaria

As noted above, caregivers and family decision-makers appreciated the use of mosquito nets in the prevention of malaria.

As will be covered later in this report, 82.6 percent of the survey respondents agreed with a statement that "sleeping under a mosquito net every night is one sure way to prevent malaria". Of these, 43.2 percent strongly agreed with this statement.

However, those who participated in the FGDs also acknowledged that there are other caregivers and community members who dislike sleeping under nets for different reasons:

"There are other people who do not want to sleep under a net because of the chemicals on the net that itches their body" (FGD caregivers, Oyam Town Council, Oyam District).

"Other people say they feel hot when they sleep under a mosquito net or it itches their body" (FGD caregivers, Laroo Division, Gulu District).

"There are other people who say mosquito nets suffocates them" (FGD caregivers, Adok Sub-county, Dokolo District).

Caregivers' attitudes to mRDTs

As noted above, caregivers knew about RDTs for malaria. Caregivers and family decision-makers appreciated mRDTs because they improved the provision of appropriate treatment. mRDTs were noted to help VHTs and health workers confirm whether a patient has malaria or not, and prescribe the right treatment accordingly.

"It is important because it makes you know whether you have malaria or you don't. Then you decide on what to do next, either treatment or you test for other diseases" (FGD caregivers, Adok Sub-county, Dokolo District).

"RDT makes you take the right drug. What if you do not have malaria and you start on a wrong drug anyhow?" (FGD caregivers, Laroo Division, Gulu District).

"The RDT test is very important because that is the only way you can know that you have malaria so that you don't treat what you don't know" (FGD household heads, Laroo Sub-county, Amudat District).

Caregivers also pointed out other benefits of mRDTs such as avoiding wastage of anti-malarials. Others specifically pointed out that there are illnesses, other than malaria, which present with fever.

"Even cough brings fever, and other diseases also bring fever. So by testing for malaria is when one can confirm that it is malaria" (FGD caregivers, Namakora Sub-county, Kitgum District).

Some caregivers were supportive of the use of mRDTs because they knew that VHTs had been trained in how to use them.

"We will definitely allow our children to be tested by the VHTs because they have been trained by the government and been given medicine that means they know what they are doing" (FGD caregivers, Amudat Sub-county, Amudat District).

Moreover, some argued, VHTs live and work within their communities, and this saves the caregivers money and time that would otherwise be spent seeking malaria testing services from far away.

“It’s also good for the VHTs to use this test here because they are with us here in the village so we don’t have to move for a long distance to the health centre, they also save time and the malaria can be treated very early” (FGD caregivers, Kotido District).

Despite the importance of RDTs in malaria management, especially among children under five, there were challenges that caused some caregivers to question the acceptability of the results. For example, some caregivers hold a negative perception that RDTs give negative results. This usually occurs when the child continues to have fever, even though the test for malaria is negative. Some caregivers do not appreciate that there are many causes of fever, not just malaria.

“I may agree with results of the RDT but sometimes the RDT also tells lies. There was a time I took my child to the VHT and the test was negative. But when I went to the health centre the child was found with malaria. If a child has fever at times a child tests negative and you really get confused” (FGD caregivers, Atiak Town Council Amuru District).

“At times, they tell you the results are negative yet the child is having fever” (FGD caregivers, Bobi Sub-county, Omoro District).

Attitudes of caregivers and family decision-makers towards the role of VHTs in malaria management

VHTs exist in every village in Uganda, and caregivers were aware of them and the important role they play in providing care and treatment to their under-five children. Caregivers appreciated the role played by VHTs, and reported that they often first seek care or advice from them in case their children are sick with malaria. One of the most notable attributes appreciated by caregivers about VHTs was that they live within their communities and are therefore easily accessible. The effectiveness of VHTs as providers of treatment to under-fives at the community level is enhanced by, among other things, their closeness to the people they serve, and their desire to serve their own people. They were reported to be more than willing to serve them even at night.

“The VHTs are important because, once we take a child to them, they give us immediate assistance since they are near us” (FGD caregivers, Namakora Sub-county, Kitgum District).

“VHTs provide drugs in the community and are reachable in our villages any time of the day, especially at night” (FGD caregivers, Kaabong District).

In districts where VHTs have rectal artesunate, the VHTs were also praised by caregivers for their ability to offer pre-referral treatment and monitoring to referred children, which enables them to reach the facility and receive the attention they need.

“Why VHTs are good they even give the pre-referral medicine to the children when they refer, so that the child can reach to the health facility for better treatment and management by the health workers. And they ensure that they monitor the children who are on treatment to complete their doses” (FGD caregivers, Lokopo Sub County, Napak District).

Caregivers appreciated that VHTs are volunteers and work without pay. VHTs were also commended for reducing congestion at public health facilities. This is because the patients are handled at community level by the VHTs.

“It is also a good idea to have VHTs because they have reduced the issue of people congesting in the health centre. So it has eased the work of the health workers, since they only handle severe cases with complications because uncomplicated cases are being managed by the VHTs in villages. It is only now when they lack medicine that we go to the health centre to receive treatment” (FGD caregivers, Lokopo Sub-county, Napak District).

Last but not least, VHTs were appreciated for educating people about malaria prevention, especially the importance of sleeping under mosquito nets, as well as general domestic hygiene and sanitation.

“The VHTs even advise us to be sleeping under the mosquito net, to prevent the mosquitoes from biting us and causing malaria to us and our children. They tell the pregnant mothers to ensure sleeping under the mosquito nets daily and always advise them to go for antenatal care visit” (FGD caregivers, Lokopo Sub-county, Napak District).

Despite the important role played by VHTs, a number of challenges were noted that compromised their ability to fulfil their mandate:

- Stock-out of drugs and RDT kits. At the time of the survey most VHTs, with the exception of some districts in Karamoja sub-region, did not have Coartem and RDT kits. Consequently, their role was reduced to only providing a referral letter and proceed to the nearest health facility. *“They do not have drugs now. We just go there to get a prescription and go to buy drugs from the clinics and drug shops” (FGD caregivers, Bobi Sub-county, Omoro District).*
- VHTs were reported as not only lacking drugs and RDT kits, but also other essential supplies such as gloves, which are important to guard against the transmission of infections between a sick child and the VHT.
- Drunkenness of some VHTs. Some VHTs were reported as being always drunk, which had a negative impact on their performance. Caregivers wondered how a drunk VHT could administer an RDT. Some caregivers wondered whether a drunk VHT could interpret results correctly in order to be able to prescribe treatment.

Attitudes of caregivers and family decision-makers to pre-referral treatment with rectal artesunate

A few caregivers and family decision-makers knew about rectal artesunate because they had seen it being administered to their children with severe malaria, or they had heard about it, but a large number of caregivers did not know about it. However, when it was explained to them and how it works, they were all positive about it and were willing to allow the VHTs to administer it to their sick children with severe malaria. Those who have witnessed its administration to their children applauded its benefits in giving quick relief to the patient.

“For most children whom I have seen undertaking the treatment, it is a fast relief from fever, and so I support it and will accept my child to be treated with it” (FGD caregivers, Laroo Division, Gulu District).

“For me, I have seen it and I have experience with the medicine when my nephew was severely ill. So the moment I brought him to the health facility then the nurse put this medicine in the anus of the child, so the child came back to his normal senses and they started giving other treatment, so the child is now alive up to today. We shall accept the VHTs to treat our children with this medicine” (FGD household heads, Lokopo Sub County, Napak District).

Caregivers and household heads expressed readiness to accept the use of RDTs to test their children for malaria. Some, however, cautioned that VHTs should first receive adequate training if they are to allow their children to be administered rectal artesunate.

“Our VHTs still need a lot of knowledge about drugs and training on how to handle people, but if they are trained to insert the drug (artesunate), it will be okay and I will allow my children to get the drug” (FGD caregivers, Kaabong District).

The issue of further training for VHTs was a particular concern in the Karamoja region, where it was reported that most VHTs have low levels of education.

Attitudes of family decision-makers towards the role of VHTs in their communities

VHTs were very much appreciated by family household heads. They were hailed as important because they do not only treat children suffering from malaria, but also because, when faced with cases they cannot handle, they advise or refer them to appropriate referral centres where they can be best handled. In addition, they mobilise communities for preventive health programmes.

“They are good because they make home visits and when people are sick they advise them accordingly” (FGD household heads, Nadunget Sub-county, Moroto District).

“VHTs are very important in that when an illness starts, you quickly look for them and if they have medicine they will give it to the child, and when the condition is beyond them they refer to the health centre” (FGD household heads, Palabek Gem Sub-county, Lamwo District).

Most FGD participants particularly liked the fact that the VHTs are more accessible than health facility-based health workers, especially if the child falls sick at night.

“They are very important because even if at night the child has any fever, VHT test blood and give you medicine. They give you this for the night, then in the morning you take the child to the facility. VHTs are very important because the facility may be of distance (3-4km); you can reach a VHT and ask them to assist you with first aid so that the child can have energy to reach the facility” (FGD, caregivers, Alerek Sub-county, Abim District).

“These VHTs are very important. They do what health workers are not able to do for us in very difficult times like coming to help us out in the middle of the night. They give like first aid that is in the night, then in the morning they can refer you to the nearest health facility if they feel they will not be able to handle [the case]” (FGD household heads, Lokopo Sub-county, Napak District).

The fact that VHTs are able to test for malaria first before referral was also a reason for their acceptability among community members.

“What makes these people important; first of all, they first test the child from home, and after testing, they see signs and confirm the disease the child is suffering from. Then they give you some medicine for that day and when there is no improvement, you go back to them and they may refer you to the health centre” (FGD household heads, Alerek Sub-county, Abim District).

“They are important in the sense that not all people stay in the centre where there is a health facility, because when sickness comes at night then you reach for them to help” (FGD household heads Atiak Town Council, Amuru District).

Despite appreciation of the important role played by VHTs, participants noted a number of challenges they encounter while seeking care from the VHTs. These included VHTs sometimes running out of drug stocks, and in some communities the long distances to reach VHTs' homes.

Attitudes of caregivers and family decision-makers towards referral for their children

As earlier noted, VHTs give referrals to caregivers whose children have been tested for malaria using an RDT and the results are negative, or when the child has been assessed to be seriously sick. Such children usually manifest symptoms such as vomiting or convulsing. Caregivers who participated in

FGDs appreciated the fact that VHTs make referrals if they cannot handle a particular case, or if they assess that it is a case of severe malaria.

“They offer us referrals if they cannot handle a case” (FGD caregivers, Bobi Sub County, Omoro District).

“VHTs are good because they monitor the condition of the children who they treat in the villages to see if they are improving or catching up with the treatment, and if the child persists with the sickness they refer to other health facilities” (FGD caregivers, Lokopo Sub-county, Napak District).

Some caregivers reported that they usually comply with referral by the VHTs because they want to save the life of their children. They appreciate the referral because they trust the advice of the VHTs. They therefore quickly take the children to the referred facilities.

“If the VHT refers my child to the health facility, I will be willing to go because my child is ill so I will not delay, I will take him/her immediately” (FGD caregivers, Lokopo Sub-county, Napak District).

“I will take her/his advice but I will also ask her/him to accompany us, especially for a child under five years, as if you go direct to the health centre without going to the VHT they will tell you that your drugs are with the VHT” (FGD caregivers, Kaabong District).

Caregivers also knew that VHTs write a referral form to a referred patient and give it to caregivers to quickly proceed to the nearest public health facility. They first discuss with the caregivers about their preferred facility choice. The referral form serves two main purposes: to specify what treatment the child has received from the VHTs; and to indicate that it is a referral, and therefore requires quick attention by the health workers at the facility.

Some caregivers, however, hesitate when they are referred for several reasons, including transport costs, long distances to health facilities, and the perceived poor quality of care at the referral facility. Some caregivers therefore prefer to remain with the VHTs even when referred.

“Distance between the villages and health centre is so far that we do prefer just to remain with the VHTs” (FGD caregivers, Kotido District).

“Another problem is that these emergencies come when there is no money and even if it is there, it may not be enough to help you with the bills. For example, many boda boda riders here do not understand when it is an emergency, and there is no money present. They will first want to confirm that you have money by even telling you that they have no fuel in the bike. Also in the hospital, you can go and the nurses can tell you to buy a cannula or any other medicine and you may not have money to hand” (FGD caregivers, Amudat Sub-county, Amudat District).

“At times you can be very sick and you have been referred, but you may not have money to help you proceed, so this is among the things that can prevent you from reaching the health centre early” (FGD caregivers, Atiak Town Council, Amuru District).

“At times when you go to the health centre in the evening hours the nurses tend to ignore you even though the child is very ill” (FGD caregivers, Kotido District).

Attitudes of caregivers and family decision-makers towards seeking care for malaria from health facilities

Most caregivers and family decision-makers acknowledged that health facilities offer a level of care that VHTs cannot offer. For instance, they reported that health workers are able to manage complicated malaria better than a VHT. They also cited cases where the patient needs to be put on a drip, or admitted, or given a blood transfusion. Others reported that health facility workers are better trained and there are several of them, with the opportunity to consult each other.

However, some caregivers and household heads expressed their reluctance to seek care from health facilities. This reluctance was mainly rooted in the perceived poor quality of services in public health facilities, reflected through stock-outs of drugs and the poor attitudes of some health workers.

“There is also a problem of delays by the health workers to respond to emergencies. You can rush to the health unit with someone who is very badly ill and when you reach there, the people in charge take their own time which is really very annoying because sometimes this brings about the loss of people’s lives” (FGD caregivers, Amudat Sub-county, Amudat District).

“Stock-out of drugs is so common in our health centres that even if you go you will find the drugs not there. They instead refer you to go and buy drugs from the clinic” (FGD caregivers, Adok Sub-county, Dokolo District).

These sentiments were also confirmed by district key informants, who reported that some of the factors affecting people’s choice of where to seek care for childhood illnesses included accessibility, availability of medicines at health facilities, and perceptions about health worker attitudes. In the particular case of Karamoja region, the issue of access in terms of distance to health facilities was reported to be critical. In some places, people can only find a health facility about 60kms away. The long distances deter many people from going to health facilities, and instead they seek care from drug shops and traditional healers including traditional birth attendants (TBAs).

“When patients go to PNFs [private-not-for-profits], they get all the medicines available, so they say: ‘If I go to these PNFs, I get all the medicines I want even if they charge me but sometimes when I go to a government health facility, you are told to go and buy.’ That is why some of them go to PNFP facilities. Then others prefer to go to government facilities because they offer free services, and our people are still poor...” (KII, Malaria FP, Otuke District).

4.5 Attitudes towards malaria prevention, diagnosis and treatment

4.5.1 Attitudes among caregivers of children under five and family decision-makers

Attitudes of caregivers and family decision-makers to the use of mosquito nets in the prevention of malaria

As noted above, caregivers and family decision-makers appreciated the use of mosquito nets in the prevention of malaria.

As will be covered later in this report, 82.6 percent of the survey respondents agreed with a statement that “sleeping under a mosquito net every night is one sure way to prevent malaria”. Of these, 43.2 percent strongly agreed with this statement.

However, those who participated in the FGDs also acknowledged that there are other caregivers and community members who dislike sleeping under nets for different reasons:

“There are other people who do not want to sleep under a net because of the chemicals on the net that itches their body” (FGD caregivers, Oyam Town Council, Oyam District).

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Caregivers’ attitudes towards mRDTs

As noted above, caregivers knew about RDTs for malaria. Caregivers and family decision-makers appreciated mRDTs because they improved the provision of appropriate treatment. mRDTs were noted to help VHTs and health workers confirm whether a patient has malaria or not, and prescribe the right treatment accordingly.

“It is important because it makes you know whether you have malaria or you don’t. Then you decide on what to do next, either treatment or you test for other diseases” (FGD caregivers, Adok Sub-county, Dokolo District).

“RDT makes you take the right drug. What if you do not have malaria and you start on a wrong drug anyhow?” (FGD caregivers, Laroo Division, Gulu District).

“The RDT test is very important because that is the only way you can know that you have malaria so that you don’t treat what you don’t know” (FGD household heads, Laroo Sub-county, Amudat District).

Caregivers also pointed out other benefits of mRDTs such as avoiding wastage of anti-malarials. Others specifically pointed out that there are illnesses, other than malaria, which present with fever.

“Even cough brings fever, and other diseases also bring fever. So by testing for malaria is when one can confirm that it is malaria” (FGD caregivers, Namakora Sub-county, Kitgum District).

Some caregivers were supportive of the use of mRDTs because they knew that VHTs had been trained in how to use them.

“We will definitely allow our children to be tested by the VHTs because they have been trained by the government and been given medicine that means they know what they are doing” (FGD caregivers, Amudat Sub-county, Amudat District).

Moreover, some argued, VHTs live and work within their communities, and this saves the caregivers money and time that would otherwise be spent seeking malaria testing services from far away.

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Despite the importance of RDTs in malaria management, especially among children under five, there were challenges that caused some caregivers to question the acceptability of the results. For example, some caregivers hold a negative perception that RDTs give negative results. This usually

occurs when the child continues to have fever, even though the test for malaria is negative. Some caregivers do not appreciate that there are many causes of fever, not just malaria.

“I may agree with results of the RDT but sometimes the RDT also tells lies. There was a time I took my child to the VHT and the test was negative. But when I went to the health centre the child was found with malaria. If a child has fever at times a child tests negative and you really get confused” (FGD caregivers, Atiak Town Council Amuru District).

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Caregivers appreciated that VHTs are volunteers and work without pay. VHTs were also commended for reducing congestion at public health facilities. This is because the patients are handled at community level by the VHTs.

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Last but not least, VHTs were appreciated for educating people about malaria prevention, especially the importance of sleeping under mosquito nets, as well as general domestic hygiene and sanitation.

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Despite the important role played by VHTs, a number of challenges were noted that compromised their ability to fulfil their mandate:

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- VHTs were reported as not only lacking drugs and RDT kits, but also other essential supplies such as gloves, which are important to guard against the transmission of infections between a sick child and the VHT.
- Drunkenness of some VHTs. Some VHTs were reported as being always drunk, which had a negative impact on their performance. Caregivers wondered how a drunk VHT could administer an RDT. Some caregivers wondered whether a drunk VHT could interpret results correctly in order to be able to prescribe treatment.

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children with severe malaria. Those who have witnessed its administration to their children applauded its benefits in giving quick relief to the patient.

“For most children whom I have seen undertaking the treatment, it is a fast relief from fever, and so I support it and will accept my child to be treated with it” (FGD caregivers, Laroo Division, Gulu District).

“For me, I have seen it and I have experience with the medicine when my nephew was severely ill. So the moment I brought him to the health facility then the nurse put this medicine in the anus of the child, so the child came back to his normal senses and they started giving other treatment, so the child is now alive up to today. We shall accept the VHTs to treat our children with this medicine” (FGD household heads, Lokopo Sub County, Napak District).

Caregivers and household heads expressed readiness to accept the use of RDTs to test their children for malaria. Some, however, cautioned that VHTs should first receive adequate training if they are to allow their children to be administered with rectal artesunate.

“Our VHTs still need a lot of knowledge about drugs and training on how to handle people, but if they are trained to insert the drug (artesunate), it will be okay and I will allow my children to get the drug” (FGD caregivers, Kaabong District).

The issue of further training for VHTs was a particular concern in the Karamoja region, where it was reported that most VHTs have low levels of education.

Attitudes of family decision-makers towards the role of VHTs in their communities

VHTs were very much appreciated by family household heads. They were hailed as important because they do not only treat children suffering from malaria, but also because, when faced with cases they cannot handle, they advise or refer them to appropriate referral centres where they can be best handled. In addition, they mobilise communities for preventive health programmes.

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Most FGD participants particularly liked the fact that the VHTs are more accessible than health facility-based health workers, especially if the child falls sick at night.

“They are very important because even if at night the child has any fever, VHT test blood and give you medicine. They give you this for the night, then in the morning you take the child to the facility. VHTs are very important because the facility may be of distance (3-4km); you can reach a VHT and ask them to assist you with first aid so that the child can have energy to reach the facility” (FGD, caregivers, Alerek Sub-county, Abim District).

“These VHTs are very important. They do what health workers are not able to do for us in very difficult times like coming to help us out in the middle of the night. They give like first aid that is in the night, then in the morning they can refer you to the nearest health facility if they feel they will not be able to handle [the case]” (FGD household heads, Lokopo Sub-county, Napak District).

The fact that VHTs are able to test for malaria first before referral was also a reason for their acceptability among community members.

“What makes these people important; first of all, they first test the child from home, and after testing, they see signs and confirm the disease the child is suffering from. Then they give you some medicine for that day and when there is no improvement, you go back to them and they may refer you to the health centre” (FGD household heads, Alerek Sub-county, Abim District).

“They are important in the sense that not all people stay in the centre where there is a health facility, because when sickness comes at night then you reach for them to help” (FGD household heads Atiak Town Council, Amuru District).

Despite appreciation of the important role played by VHTs, participants noted a number of challenges they encounter while seeking care from the VHTs. These included VHTs sometimes running out of drug stocks, and in some communities the long distances to reach VHTs’ homes.

Attitudes of caregivers and family decision-makers towards referral for their children

As earlier noted, VHTs give referrals to caregivers whose children have been tested for malaria using an RDT and the results are negative, or when the child has been assessed to be seriously sick. Such children usually manifest symptoms such as vomiting or convulsing. Caregivers who participated in FGDs appreciated the fact that VHTs make referrals if they cannot handle a particular case, or if they assess that it is a case of severe malaria.

“They offer us referrals if they cannot handle a case” (FGD caregivers, Bobi Sub County, Omoro District).

“VHTs are good because they monitor the condition of the children who they treat in the villages to see if they are improving or catching up with the treatment, and if the child persists with the sickness they refer to other health facilities” (FGD caregivers, Lokopo Sub-county, Napak District).

Some caregivers reported that they usually comply with referral by the VHTs because they want to save the life of their children. They appreciate the referral because they trust the advice of the VHTs. They therefore quickly take the children to the referred facilities.

“If the VHT refers my child to the health facility, I will be willing to go because my child is ill so I will not delay, I will take him/her immediately” (FGD caregivers, Lokopo Sub-county, Napak District).

“I will take her/his advice but I will also ask her/him to accompany us, especially for a child under five years, as if you go direct to the health centre without going to the VHT they will tell you that your drugs are with the VHT” (FGD caregivers, Kaabong District).

Caregivers also knew that VHTs write a referral form to a referred patient and give it to caregivers to quickly proceed to the nearest public health facility. They first discuss with the caregivers about their preferred facility choice. The referral form serves two main purposes: to specify what treatment the child has received from the VHTs; and to indicate that it is a referral, and therefore requires quick attention by the health workers at the facility.

Some caregivers, however, hesitate when they are referred for several reasons, including transport costs, long distances to health facilities, and the perceived poor quality of care at the referral facility. Some caregivers therefore prefer to remain with the VHTs even when referred.

“Distance between the villages and health centre is so far that we do prefer just to remain with the VHTs” (FGD caregivers, Kotido District).

“Another problem is that these emergencies come when there is no money and even if it is there, it may not be enough to help you with the bills. For example, many boda boda riders here do not understand when it is an emergency, and there is no money present. They will first want to confirm that you have money by even telling you that they have no fuel in the bike. Also in the hospital, you can go and the nurses can tell you to buy a cannula or any

other medicine and you may not have money to hand” (FGD caregivers, Amudat Sub-county, Amudat District).

“At times you can be very sick and you have been referred, but you may not have money to help you proceed, so this is among the things that can prevent you from reaching the health centre early” (FGD caregivers, Atiak Town Council, Amuru District).

“At times when you go to the health centre in the evening hours the nurses tend to ignore you even though the child is very ill” (FGD caregivers, Kotido District).

Attitudes of caregivers and family decision-makers towards seeking care for malaria from health facilities

Most caregivers and family decision-makers acknowledged that health facilities offer a level of care that VHTs cannot offer. For instance, they reported that health workers are able to manage complicated malaria better than a VHT. They also cited cases where the patient needs to be put on a drip, or admitted, or given a blood transfusion. Others reported that health facility workers are better trained and there are several of them, with the opportunity to consult each other.

However, some caregivers and household heads expressed their reluctance to seek care from health facilities. This reluctance was mainly rooted in the perceived poor quality of services in public health facilities, reflected through stock-outs of drugs and the poor attitudes of some health workers.

“There is also a problem of delays by the health workers to respond to emergencies. You can rush to the health unit with someone who is very badly ill and when you reach there, the people in charge take their own time which is really very annoying because sometimes this brings about the loss of people’s lives” (FGD caregivers, Amudat Sub-county, Amudat District).

“Stock-out of drugs is so common in our health centres that even if you go you will find the drugs not there. They instead refer you to go and buy drugs from the clinic” (FGD caregivers, Adok Sub-county, Dokolo District).

These sentiments were also confirmed by district key informants, who reported that some of the factors affecting people’s choice of where to seek care for childhood illnesses included accessibility, availability of medicines at health facilities, and perceptions about health worker attitudes. In the particular case of Karamoja region, the issue of access in terms of distance to health facilities was reported to be critical. In some places, people can only find a health facility about 60kms away. The long distances deter many people from going to health facilities, and instead they seek care from drug shops and traditional healers including traditional birth attendants (TBAs).

“When patients go to PNFs [private-not-for-profits], they get all the medicines available, so they say: ‘If I go to these PNFs, I get all the medicines I want even if they charge me but sometimes when I go to a government health facility, you are told to go and buy.’ That is why

some of them go to PNFP facilities. Then others prefer to go to government facilities because they offer free services, and our people are still poor...” (KII, Malaria FP, Otuke District).

4.5.2 Attitudes among pregnant women

Attitudes of pregnant women towards the use of mosquito nets

As earlier reported, pregnant women knew that sleeping under a mosquito net is an effective way to prevent malaria.

“...when the nets are still new, the medicine in the net even kills the mosquitoes before they even enter inside” (FGD, Pregnant Mothers, Kakomongole Sub-county, Nakapiripirit District).

“For me, I am so used to sleeping under a net that if I don’t sleep under it I cannot have a good night” (FGD, Pregnant Mothers, Amuru Sub County, Amuru District).

Pregnant mothers also noted that the nets have other advantages such as preventing other insects and crawling creatures such as snakes from getting onto one’s bed.

“I have the net and I must sleep under it every night because it also helps to prevent snakes from entering the bed” (FGD Pregnant Mothers, Amuru Sub-county, Amuru District).

“I have to use a net on a daily basis; in fact I don’t feel comfortable without a net, it keeps me warm and keeps me safe from crawling insects that might bite me at night and spoil my sleep” (FGD Pregnant Mothers, Bobi Sub-county, Omoro District).

Attitudes of pregnant women towards IPTp2

As has previously been noted, pregnant mothers reported that Fansidar is one of the most appropriate and effective antimalarial preventive medicines to take during pregnancy. Most, if not all, of the pregnant women surveyed knew about it, and many reported having taken it during previous pregnancies or their current pregnancy. Mothers appreciated IPT2 because it protects them from malaria which they knew can result in miscarriage and even lead to the death of the mother. They appreciated it and expressed willingness to always take it whenever they are pregnant because it protects them and their unborn child against malaria.

“For me, I am happy with it because they first sensitised us to the importance of Fansidar for pregnant women” (FGD Pregnant Mothers, Amuru Sub County, Amuru district).

“Every time I go for an antenatal care visit I am given this medicine called Fansidar. I take it because it is a very good medicine. It prevents one from getting malaria” (FGD Pregnant Mothers, Lokopo Sub County, Napak District).

Some of the women surveyed expressed a willingness to continue taking IPTp in future because of the protection it offers them against malaria. Others urged their colleagues to always take Fansidar whenever they are pregnant.

“We shall continue taking it again next time because it really protects a pregnant mother from getting malaria, and if taken in the right way during pregnancy you even do not suffer from malaria” (FGD Pregnant Mothers, Amudat District).

“These tablets (ie Fansidar) are very good for us pregnant mothers. Every time you are given them, please make sure you take them because they help so much to protect us from malaria” (FGD Pregnant Mothers, Kakomongole Sub-county Nakapiripirit District).

The appreciation of Fansidar by pregnant mothers is partly due to the awareness created about its importance by health workers. The survey noted that health workers have continuously educated pregnant mothers about its importance during pregnancy.

Pregnant mothers also appreciated the practice of taking IPT2 from the facility because it not only ensures total compliance by pregnant mothers but also enables any negative side-effects to be managed by the health workers promptly.

“It is good to take Fansidar at the health facility because other women when they take the medicine at home they don’t swallow it” (FGD Pregnant Mothers, Adok Sub-county, Dokolo District).

“Even when the mother reacts to it, at least the health worker can solve the problem of the drug” (FGD Pregnant Mothers, Amudat District).

4.5.3 Attitudes among VHTs

Attitudes of VHTs towards malaria rapid diagnostic tests

VHTs expressed positive attitudes to the mRDT. VHTs appreciate that mRDTs not only enhance the ability to give appropriate treatment by confirming whether the patient has malaria or not, but also save on wastage of anti-malarial drugs that would otherwise be given to patients who do not have malaria, but present with similar symptoms. When test results are positive, anti-malarial drugs such

as Coartem are prescribed. If they are negative, VHTs refer the patient to the nearest health facility for further investigations and management. There was also an appreciation that mRDT results are obtained quickly, and this helps to guide treatment.

“It’s a good test because it helps you to confirm if the sickness is malaria or not. If it is malaria, then you give drugs but if the test is negative then you refer the patients immediately to the health centre” (FGD VHTs, Patiko Sub-county, Gulu District).

“This test is a very good idea. We thank the government for introducing this kind of test especially for us who are deep in the villages because when a child begins getting the signs of malaria, it becomes very hard for us to run with the child to the hospital, which may be around 10 to 15kms from the village. But now, since we have the testing kits around the villages, we immediately test the child and if the results are positive, we treat there and then. If the results are negative and the child has such symptoms, we immediately refer the child to the nearest health centre because we have the referral forms” (FGD VHTs, Kakamongole Sub-county, Nakapiripirit District).

“It’s good because some mothers whenever the children get fever they begin asking for Coartem straight away but RDT helps to determine whether the child is suffering from malaria or not” (FGD VHTs Lalogi Sub-county, Omoro District).

Others like RDTs because they are easy to use.

“RDT is quite easy to use because it contains three lines and when you pour the water from the buffer after drawing the blood into the RDT, after a short period of time if it shows two lines, then the result is positive meaning that the child has malaria parasites, but if it shows one line, then the test is negative meaning that the child has no malaria parasites” (FGD VHTs, Kakamongole Sub-county, Nakapiripirit District).

While most VHTs considered conducting an mRDT as a simple and easy procedure, there were noted gaps, and some VHTs confessed to having difficulty interpreting the results.

“But at times these RDT test results confuse me. A child can have malaria but it will show negative. But if you refer the child, they again test and find that the child is positive” (FGD VHTs, Patiko Sub County, Gulu District).

P8 “I don’t trust the RDT because when I use it I get negative or positive results but when they bring [the patient] to health centres the result is different with a microscope.

P2 “I confirm that it works very well but if you don’t keep it at the normal temperature it doesn’t work well.”

P7 “To me it works very well.”

P6 “Sometimes I don’t trust it so well. One time I tested someone negative but when she went to the health centre they used a microscope and she tested positive”

(FGD, VHTs, Aboke Sub-county, Kole District).

However, other VHTs noted that such situations can occur especially when the child has just taken some treatment before the mRDT is done. Others were not able to compare RDTs and microscopy since, as they reported, they had never used the microscope.

The knowledge gaps in mRDT administration and interpretation of results by VHTs consequently calls for further training of VHTs. Indeed, VHTs expressed the desire to attend the training because this would enable them to be more competent in administering and interpreting mRDT results, as well as learning appropriate management of malaria including referral. There has been recruitment and replacement of VHTs who require orientation and training if they are to fulfil their mandate.

Attitudes of VHTs towards pre-referral treatment with rectal artesunate

Overall, VHTs’ attitudes were positive about pre-referral treatment with rectal artesunate because they appreciate its benefits to the children with severe malaria characterised by high temperature. They reported that when administered, it quickly gives relief to the patient. VHTs hailed pre-referral treatment because it has not only saved lives of children but also brought the much-needed services closer to the caregivers, given that VHTs reside within the communities.

“That medicine was a saviour to the children under five in the villages. That medicine was real medicine because a mother would bring a child really badly off here, I mean in some cases convulsing, and the moment you insert the rectal artesunate into the baby’s behind, you would see improvement in the child after around 30 minutes. The caregivers get so happy” (FGD VHTs, Kakomomgole Sub-county, Nakapiripirit District).

“That drug helps children to recover quickly. I have experienced three children I administered this rectal treatment to, and they all responded well, even the child of my friend here, who was a one-year old child, the other child was two years old. I inserted two drugs. The child was brought unconscious but this drug helped her and she was able to reach the health centre. Another one, the father brought with the same story but all these children became well” (FGD VHTs, Nadunget Sub-county, Moroto District).

Some VHTs in districts such as Gulu, Lamwo and Omoro reported that they had been trained to administer rectal artesunate, though they had never actually administered it. However, they knew that rectal artesunate was being used at health facilities to give relief to children with very high fever and those that would be convulsing.

In the Karamoja sub-region, especially in the districts of Kotido, Kaabong and Nakapiripirit, only a few VHTs reported that they were ever supplied with rectal artesunate following the training, and it was later withdrawn owing to poor administration by some VHTs.

4.5.4 Attitudes among DHMT and Health Facility Workers

Attitudes of DHMT and Health Facility Workers towards RDT use

Most health workers were happy to use RDTs because they are fast and can easily be used when handling many patients.

Health workers pointed out the challenge of convincing patients that it is not malaria if they have malaria-like symptoms but the RDT result is negative. They also reported the challenge that RDTs may post negative results even if the child has malaria and the microscope tests post positive results. Some argued that the RDT does not detect all species of malaria parasites. Health workers and DHMTs also like the RDT because it is easy to use, and can be used by VHTs, including those with low levels of education.

Other DHMT members reported very low levels of education in some of their communities, such as in Karamoja region and in parts of Otuke District. They noted that in some villages, there is hardly anybody with O-Level education, and that in such cases, it may be very difficult to get competent VHTs that can be trained to use RDTs.

Others raised concerns over lack of supervision of VHTs who administer RDTs, and expressed the fear that some of the VHTs may not be doing it right.

Attitudes of DHMT and health facility workers towards rectal medicines

Health workers and DHMT members are comfortable with the use of rectally administered medicines such as rectal artesunate on children. Many reported that they have been using rectal medicines such as rectal Valium and they had not found any challenges. Others such as those in hospitals reported that they already use rectal artesunate in the outpatient department to reduce fever among children who come with severe malaria. They also reported that the community would accept the use of rectal medicines. It was reported that in communities, there are herbal medications that are administered rectally, and so this would not be a strange form of administering treatment.

However, in some places such as Nwoya District, it was reported that rectal artesunate is usually not included in the medicines they receive, and therefore it was not being used in pre-referral treatment.

4.5.5 Attitudes of local leaders

Local leaders in various communities, such as cultural leaders, religious leaders and political leaders, are already playing key roles in health promotion generally, as well as in malaria control. Local leaders who participated in this study reported that they urge and mobilize their communities to

improve hygiene and sanitation, keep clean homes, take children for immunization, and seek treatment for children and themselves when ill. Many also reported that they influence behaviours of others by being good role models. Religious and political leaders reported that they use all platforms available to them to pass on health messages to their audiences.

Most local leaders surveyed were supportive of the idea of VHTs being trained and equipped to treat malaria at the community level.

“The idea of VHTs diagnosing and treating malaria is a very good idea, especially in the remote and inaccessible villages where the health centre is far away; they are always there to rescue the young children from these diseases” (FGD, Local leaders/Elders, Kakomongole Sub-county, Nakapiripirit District).

Local leaders also explained how they support VHTs, and expressed willingness to continue supporting them.

P3 “We support these village doctors of ours by advising and encouraging them to work with one heart even though the work is voluntary because health is meant for everyone and so it is everyone’s responsibility to make sure that the community where he or she is staying is healthy. We also share our experiences with them about how the nature of work we do as LC1s is almost similar to theirs because neither of us have a monthly salary.”

P6 “We also work with them, especially during mobilisation and sensitisation of people about various messages like family planning, gender-based violence and health issues. We simply do this to show them that we are a united team.”

P8 “We support these people by even taking our own children for them to test and treat malaria. This clearly shows that we trust them with our children and this makes them happy”

(FGD, Local leaders/Elders, Kakomongole Sub-county, Nakapiripirit District).

R7 “Sometimes we organise community meetings and invite VHTs to come and sensitise the community about health, because other people tend to forget about prevention and treatment of diseases, they do not know what to do, they need to be sensitised against malaria and diarrhoea.”

R5 “We ensure that there is cleanliness or good hygiene at home, even bushy areas are slashed”

(FGD, Local Leaders, Oyam Town Council, Oyam District).

Asked what they tell people about use of nets, local leaders demonstrated both the knowledge and the positive role they play in malaria control.

R7 “We tell them to sleep under a mosquito net because the government gave it freely so as to prevent them from getting malaria”

R3 “[We tell them:] Do not use a mosquito net for a different purpose like using it for bathing shelter, or making ropes. If you are found misusing a net you can get arrested”

R5 “We advise them to take good care of nets they received from the government. You should wash it with soap and water”

R8 “We advise them to hang the net every night throughout the year, and all the time”

(FGD, Local Leaders, Oyam Town Council, Oyam District).

Local leaders also articulated what role they should play to ensure malaria is prevented:

P1: *“To me, what we are supposed to do in order to ensure we are healthy is to bring people to the health centre to treat malaria... We have to ensure we provide awareness to community about malaria so that people sleep under the mosquito net, and when there are government programmes concerning spraying houses with insecticide to eliminate malaria, we have to ensure all houses are sprayed and people cooperate during this exercise to prevent malaria.”*

P7: *“To me, we have to ensure areas like trading centres where we fetch water is slashed out, this helps to avoid mosquitoes from being within our households. Not only that, we have to ensure the mosquito nets distributed by the government are used, not just thrown away every time during dry season, because there are mosquitoes that attack us during this period.”*

P2: *“To ensure malaria is prevented, what we are supposed to do as local leaders is to also ensure people hang and sleep under the mosquito net so that they do not have a chance of a mosquito biting them. We also ensure government programmes of mosquito spraying are done yearly. We talk to people who do the spraying to ensure everyone’s house is sprayed during this exercise.”*

(FGD, local leaders, Ogwette Sub-county, Otuke District).

Overall, local leaders were found to be knowledgeable, resourceful and holding positive attitudes towards malaria control interventions, including net use, IRS and the roles of VHTs.

4.5.6 Attitudes and practices of traditional healers

In this study we interviewed different types of traditional healers including herbalists, traditional birth attendants and divine healers.

Some traditional healers claimed that they treat common childhood illnesses including malaria, diarrhoea and pneumonia, and enumerated various herbal plants that they use to treat these diseases.

“[I treat] very many diseases, I treat malaria, I treat diarrhoea, I treat epilepsy, then I treat aah born aching and then heavy cough and easy cough and this cough - how do you call it? - whooping cough” (Interview, Traditional Healer, Dokolo District).

“I give local herbs like ‘ekorete’, ‘emekui’, ‘loderekai’, ‘ethiapo’ and all that cures malaria, and ‘ekapelimien’ for diarrhoea, and also ‘ekale’ for pneumonia” (Interview, Traditional Healer, Rupa Sub-county, Moroto District).

While some traditional healers knew the cause of malaria and how it can be prevented, others confused the causes of malaria with those of other illnesses such as diarrhoea, talking about dirty food and dirty water.

Several traditional healers reported that patients come to them because they are effective, more accessible, and cheaper. They said that they also usually have the medicines, unlike the health facilities, which run out of stocks of drugs.

“For those diseases which they have tried medicine and they have failed and they are not cured, they normally come here. When they come to me they get cured. I am cheaper and whenever they come, they get cured and I give them proper treatment but when they go to medical unit, at times they are given just Panadol they say there are no drugs in the hospital” (Interview, Traditional Healer, Dokolo District).

Traditional healers praise themselves, talking about how no child has ever died in their hands, how their medicines are effective and how a child gets better in one day after taking their medicines.

Most traditional healers also claim that they refer patients including children to health facilities if they think they will not manage them. Others reported that they refer complicated cases to other herbalists. Others reported that they send their clients to get tested (for blood, stool, etc) and then they come back for herbal treatment after knowing what they are suffering from. On the other hand, some reported that patients come to them after they have tried modern medicine and it has failed to cure them.

Some traditional healers reported that they respect modern healthcare. So if a patient comes to them after he or she has been to a health facility, they advise that patient to first complete the medicine from the health facility before they administer their own.

Most traditional healers have positive attitudes towards malaria control and believe people should use LLINs and clear their homesteads of any breeding places for mosquitoes in order to control malaria.

4.6 Practices and behaviour in relation to malaria prevention, diagnosis and treatment

In this study we investigated the behaviour and practices of various categories of actors in malaria control. In this sub-section, we discuss the practices of caregivers of children under five, pregnant women, VHTs and health workers.

4.6.1 Practices and behaviour of caregivers of children under five

Malaria prevention practices

In this study we asked caregivers of children under five and pregnant mothers who participated in the survey what they were doing to protect themselves from malaria. Table 7 shows the results of the reported actions.

Table 7: Reported actions taken by respondents to protect themselves from malaria

District	Sleeps under a net	Slashes bushes / grass around home	Drains stagnant water	Closes windows / doors early	IRS	Taken IPTp	Sprays with insecticide	Other	Nothing	Number
ABIM	88 %	40%	40%	18%	4%	6%	0%	27%	2%	50
AGAGO	91%	52%	37%	18%	5%	7%	4%	12%	4%	120
ALEBTONG	85%	52%	28%	19%	53%	12%	4%	8%	2%	124
AMOLATAR	91%	32%	18%	16%	63%	12%	4%	2%	3%	76
AMUDAT	94%	94%	52%	60%	0%	33%	0%	2%	0%	48
AMURU	87%	76%	68%	42%	28%	10%	1%	17%	2%	100
APAC	90%	60%	33%	30%	21%	9%	3%	21%	4%	197
DOKOLO	98%	67%	47%	26%	12%	3%	4%	2%	3%	96
GULU	94%	66%	53%	47%	21%	11%	9%	15%	1%	151
KAABONG	86%	74%	36%	41%	0%	33%	1%	43%	2%	81

KABERAMAIDO	95%	43%	38%	18%	76%	11%	5%	3%	0%	104
KITGUM	94%	78%	57%	53%	26%	9%	4%	7%	2%	116
KOLE	95%	56%	39%	22%	22%	5%	2%	19%	2%	131
KOTIDO	86%	69%	37%	20%	0%	27%	6%	41%	7%	71
LAMWO	85%	54%	47%	29%	10%	9%	0%	17%	8%	79
MOROTO	82%	77%	42%	12%	5%	16%	7%	9%	5%	60
NAKAPIRIPIRIT	89%	78%	60%	52%	4%	30%	3%	8%	3%	73
NAPAK	87%	86%	54%	45%	0%	19%	0%	3%	1%	73
NWOYA	78%	64%	39%	29%	10%	4%	1%	22%	6%	72
OMORO	91%	64%	62%	28%	31%	7%	0%	12%	5%	86
OTUKE	95%	69%	44%	17%	49%	12%	3%	15%	2%	59
OYAM	92%	54%	29%	21%	9%	6%	6%	10%	4%	213
PADER	90%	72%	48%	30%	19%	1%	0%	16%	4%	90
Total	90%	63%	42%	30%	22%	11%	3%	14%	3%	
Number	2042	1417	960	674	487	253%	76	301	68	2270

The reported actions taken by respondents to protect themselves from malaria included sleeping under a net (90 percent), slashing bushes and grass around the homestead (63 percent), draining stagnant water around the home (42 percent), closing windows and doors early (30 percent), and indoor residual spraying (22 percent). Women also reported taking IPTp (11 percent). Use of nets as a preventive measure against malaria was most reported in Dokolo (98 percent), followed by Kaberamaido, Kole and Otukey, all at 95 percent. The district where use of nets was least-reported was Nwoya at 78 percent. The high reported use of nets can be attributed to the recent mass distribution of nets across the country, which took place in these regions in early 2017.

Slashing around the homestead was most reported in Amudat (94 percent) and Napak (86 percent); draining of stagnant water was most reported in Amuru (68 percent) and Omoro (62 percent), while closing windows and doors early was most reported in Amudat (60 percent). IRS was most reported in Kaberamaido (76 percent), Amolator (63 percent) and Alebtong (53 percent). These districts are some of the most recent recipients of IRS, with the last round done in 2017. IPT was most reported in the six Karamoja districts of Amudat, Kaabong, Kotido, Moroto, Nakapiripirit, and Napak.

We further asked the respondents about their net use behaviour, specifically whether they usually slept under a net and whether they had slept under a net the night before the interview. The results are shown in Table 8.

Table 8: Net use behaviour among survey respondents

District	Sleeps under a net				Slept under a net last night			
	Yes	Sometimes	No	Number	Yes	Partly	No	Number
ABIM	84%	8%	8%	50	92%	0%	8%	48
AGAGO	87%	3%	10%	115	88%	3%	10%	115
ALEBTONG	85%	0%	15%	123	83%	1%	17%	115
AMOLATAR	86%	4%	11%	76	89%	3%	8%	64
AMUDAT	94%	0%	6%	48	95%	0%	5%	44
AMURU	89%	2%	9%	98	88%	1%	11%	85
APAC	92%	0%	8%	195	94%	0%	6%	187
DOKOLO	97%	0%	3%	96	98%	0%	2%	95
GULU	91%	1%	8%	147	95%	0%	5%	128
KAABONG	84%	5%	10%	77	90%	1%	8%	73
KABERAMAIDO	97%	0%	3%	101	90%	0%	10%	98
KITGUM	90%	0%	10%	112	92%	0%	8%	103
KOLE	95%	0%	5%	130	94%	0%	6%	125
KOTIDO	84%	3%	13%	69	92%	2%	6%	66
LAMWO	83%	5%	12%	77	89%	1%	10%	73
MOROTO	78%	7%	15%	55	83%	4%	13%	47
NAKAPIRIPIT	86%	1%	12%	72	89%	3%	8%	62
NAPAK	91%	1%	7%	68	88%	0%	12%	60
NWOYA	78%	0%	22%	67	87%	0%	13%	55
OMORO	85%	0%	15%	86	84%	0%	16%	70
OTUKE	95%	0%	5%	58	95%	0%	5%	56
OYAM	92%	0%	8%	213	91%	1%	8%	211
PADER	84%	0%	16%	90	89%	0%	11%	85

Total	88.9%	9.7%	1.3%		90.7%	8.6%	0.8%	
Number	1,977	216	30	2,223	1,872	177	16	2,065

The results in Table 8 show that 88.9 percent of the respondents reported that they usually use nets, while 9.7 percent reported that they sometimes used nets. Consistent with these findings, 90.7 percent reported that they used a net the night before the interview. On the other hand, 8.6 percent reported that they use the net only part of the night.

From FGD data, most caregivers and household heads acknowledged that they had mosquito nets in their homes, and reported that they have adopted a culture of using them in a bid to prevent malaria.

“For me I sleep under the net every day and I make sure that all members in my home sleep under the nets every day” (FGD caregivers, Lokopo Sub-county, Napak District).

“The way I prevent malaria is by making all my children and people at home sleep under mosquito nets all the time. Even when a visitor comes to my home, I also make sure that he or she sleeps under a mosquito net” (FGD caregivers, Kotido District).

“As for me, I ensure that all my houses are sprayed and all the family members must sleep under mosquito nets” (FGD household heads, Patiko Sub-county, Gulu District).

However, some caregivers reported that they did not have enough nets in their homes. They reported that while everyone needs to sleep under a net, when they are not adequate, priority is given to children and pregnant women because they are more vulnerable to malaria than any other group in the household.

“All my children below 10 years sleep under a net every day, but because there are not enough for all, some adults especially visitors don’t use nets. I would rather protect my children first since they suffer most from malaria” (FGD caregivers, Laroo Division, Gulu District)

“As a pregnant mother I use a net and my child. The rest can hold on until when we get extra nets. I have more risk and as well my young baby, so the reason we are a priority every day to sleep under a net” (FGD caregivers, Laroo Division, Gulu District).

On the other hand, while most caregivers reported that they have nets, some also reported that some of their household members do not use them even when they are available in their homes. There are various reasons advanced for not using nets, including drunkenness, especially of men; complaints that nets itch them; and a perception that the house has just been sprayed and therefore there are no mosquitoes. Others say that the chemical in the net gives them a cough, it suffocates them or they get breathing difficulties. Other caregivers reported that they feel hot when they sleep under a net during certain seasons, particularly the dry seasons. Others reported that they find nets uncomfortable to sleep under, while others hold the perception that the chemical in the nets is dangerous to their health.

“I do not sleep under a net because I missed getting one the last time they were being distributed. I was not around; that is why I do not sleep under a net” (FGD household heads, Ogwete Sub-county, Otuke District).

“I use it mainly during rainy seasons, but during dry seasons, I do not use it because it is hot” (FGD household heads, Patiko Sub-county, Gulu District).

“There was one person who once told me that when he sleeps under a net it makes him think that he is sleeping in a grave” (FGD household heads, Adok Sub-county, Dokolo District).

Other practices such as alcohol consumption were also reported to interfere with the use of nets. The drinkers either forget to put the net up, or their spouses don't bother to put up the nets in the fear that the drunkard will tear the net or fail to enter the bed.

“Once in a while when I drink alcohol I realise in the morning that I have not slept under a net” (FGD household heads, Oyam Town Council, Oyam District).

Some key informants also reported that the social-cultural context of their societies influences the adoption of malaria prevention practices such as net use. It was reported, for instance, that the nature of houses in Acholi and Lango sub-regions are not appropriate for hanging nets over beds. The grass-thatched round huts are too short and small. The bedrooms are also small.



Photo 1: A net hanged for use in Moroto: The poor quality of housing is a constraint to effective net use

It was further revealed that in most cases, because the bedrooms are small, the beds are also small (single size), so husbands do not share beds with their wives throughout the night. Instead, the wife is invited to the husband's bed to perform her conjugal duties, and thereafter retreats to sleep on the mat placed on the floor with the children. Use of nets for those who sleep on the mat/floor is difficult as the net may not reach the floor and leave enough for tucking under the mat. The nets used on mats are also likely to develop holes quite quickly owing to the sharp and prickly ends of the papyrus that the mat is made of. It is important therefore for Malaria Consortium and other partners to study these aspects of the social cultural context in detail in order to inform the design of nets and design of interventions that are suited to such contexts.

Net ownership

One of the factors that determine the use of nets is household ownership of nets. Figure 1 shows that the ownership of at least one net was high across all the districts, with the highest level of net ownership being in Kaberamaido at 100 percent, and the lowest being reported in Nakapiripirit, which was also quite high at 79.5 percent.

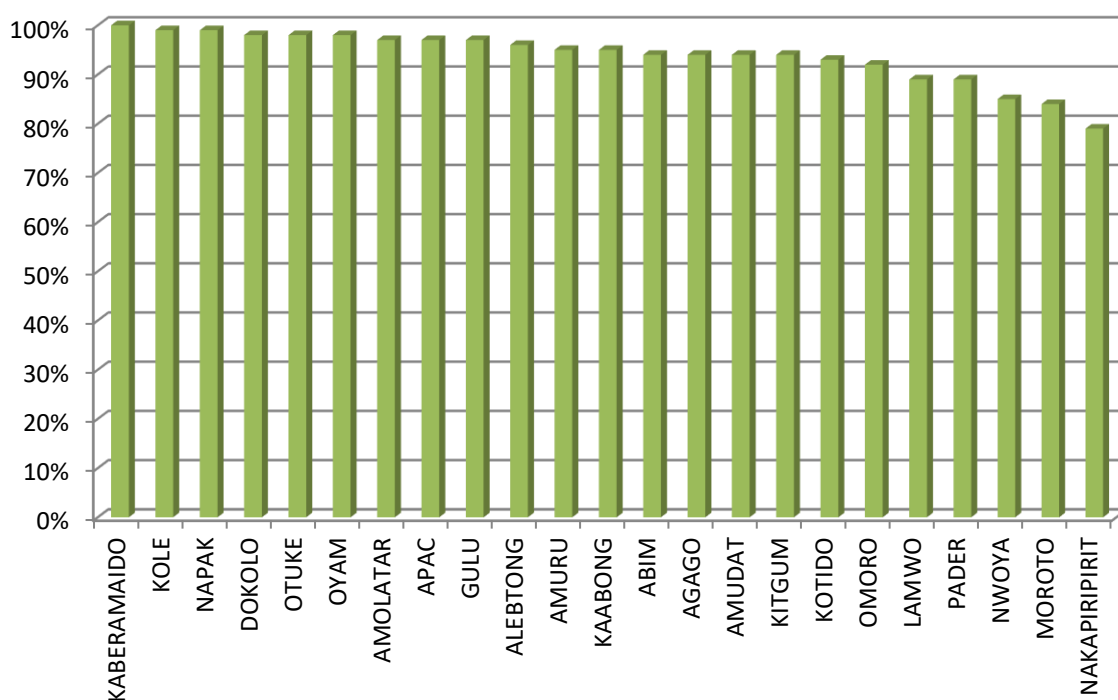


Figure 1: Proportion of households reported to possess mosquito nets by district

The high levels of net ownership can be attributed to the recent mass net distribution by the Government of Uganda, which covered all districts. It has also been sustained by the routine mosquito net distribution through other channels such as ANC attendance and immunisation.

Observation data on nets

In order to further understand the household practices regarding nets, we conducted observation of nets in a sample of households. Observation was conducted in 101 households, and a total of 219 nets were observed during the survey.

Type of Nets

Figure 2 shows the type of nets found in the observed households.

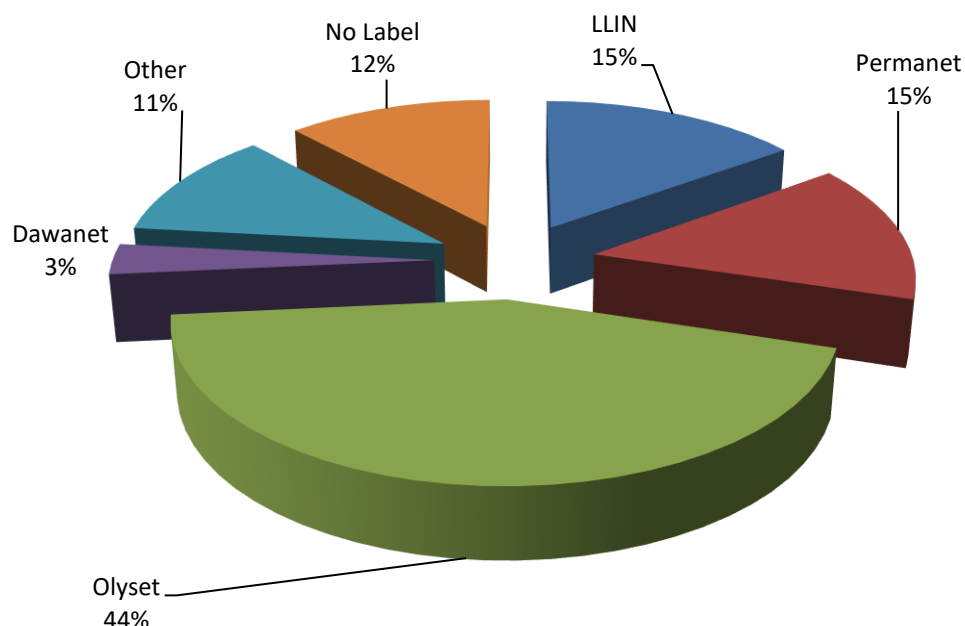


Figure 2: Type of net found in observed households

(N=219)

As can be deduced from the data in Figure 2, the majority of the nets found in the observed households were LLINs, considering that those that were labelled LLIN, Permanet, Olyset, and Dawanet are all LLINs, totalling up to 77 percent. It can also be noted that most of the observed households most likely received nets during the mass net distribution by the government, considering that the LLINs distributed under the mass campaign were of two brands, namely Olyset and Permanet, which constitute the biggest percentage observed in Figure 2.

Household Care for Nets

The data shows that 67.6 percent of the nets observed were hanging down from the ceiling/roof of the house over a sleeping space, in a position so as to be used. On the other hand, 32.4 percent were not hanging. Thus, whereas about 90 percent of the respondents reported that they used a net the night before, the proportion of the nets observed which were hanging in a use-position were far fewer³.

Of the nets that were hanging, 64.2 percent were tucked away during the day, a practice that is recommended to protect the net from getting accidentally spoilt if it is left hanging freely. As part of the BCC campaign, household members should be taught about caring for their nets, including tucking them away during the day.

³ Please note that observation was done in a smaller sample of households compared to survey interviews.

Of all the observed nets, 34.7 percent were observed to have some holes. In only 44.7 percent of these cases had any visible efforts been made to repair the nets. It is important that household members are encouraged to repair their torn nets before the holes get bigger.

Misuse of nets

There were, however, reports that some community members were misusing nets, including the LLINs received from the government mass net distribution. Nets were reportedly being used for fishing, for protecting seedlings and young crops, for protecting chicks from predators, for making ropes, for catching white ants, and as bedding. Whereas some of the community members surveyed reported that only old nets were being put to such uses, others and even key informants reported that even new nets were subject to abuse.

“Another thing that we also noticed, this is not culture but maybe poverty, they turn the nets into bedding, i.e. bedsheets and blankets. ‘Instead of putting the net rightly, I put the net down and I throw myself on it or I get the net and then cover myself [laughter].’ People have also found those nets good for catching white ants. They go and cover the anti-hill with the net in order to capture the white ants. Yeah, and even fishing. Even for construction, they make ropes out of those nets... for construction and even to tie goats. You find a blue rope in the goat’s neck along the way, that is the net. Even for charcoal, they make those tinny tinny ropes for tying and covering the bag of the charcoal - making sure the charcoal doesn’t fall out. So, they are doing all sorts of things” (Malaria Focal Person, Pader District).



Photo 2: A new net used as bedding in Kole

Other malaria preventive methods used by caregivers and family heads

Besides the use of nets, caregivers and household heads also reported that they were using other methods to prevent malaria. These included IRS, clearing all bushes around the house and draining all stagnant water to deny mosquito breeding grounds, closing windows and doors early, and burning certain types of grasses.

“We also prevent malaria by avoiding stagnant water in the compound since the stagnant water attracts mosquitoes, and slashing the grass around the house to avoid mosquito breeding places” (FGD caregivers, Lakopo Sub-county, Napak District).

“We also clear the bushes around our homes to prevent mosquitoes from hiding in the bushes” (FGD caregivers, Amudat Sub-county, Amudat District).

“Locally, we burn some type of grass in the house and the smell chases away mosquitoes. That is used in case you do not want to sleep under a net; then you will notice that mosquitoes did not succeed to enter the house because the smell disorients them and does not allow them to enter the house” (FGD household heads, Ogwete Sub-county, Otuke District).

“For me, I have painted my wall all white because I have realised mosquitoes fear white things” (FGD Male caregivers, Patiko Sub-county, Gulu District).

They also noted the planting of a grass called “lothiru” which chases away mosquitoes from the compound, and this was done particularly in the Karamoja sub-region.

Caregivers and family decision makers’ practices for treatment of suspected malaria

In this study we investigated the practices of caregivers of children under five and the household heads in the management of malaria. First, we asked the caregivers in the survey if any of their children aged under five had suffered from malaria in the three months preceding the study. Figure 3 shows the proportion of caregivers that reported a child with malaria in the past three months.

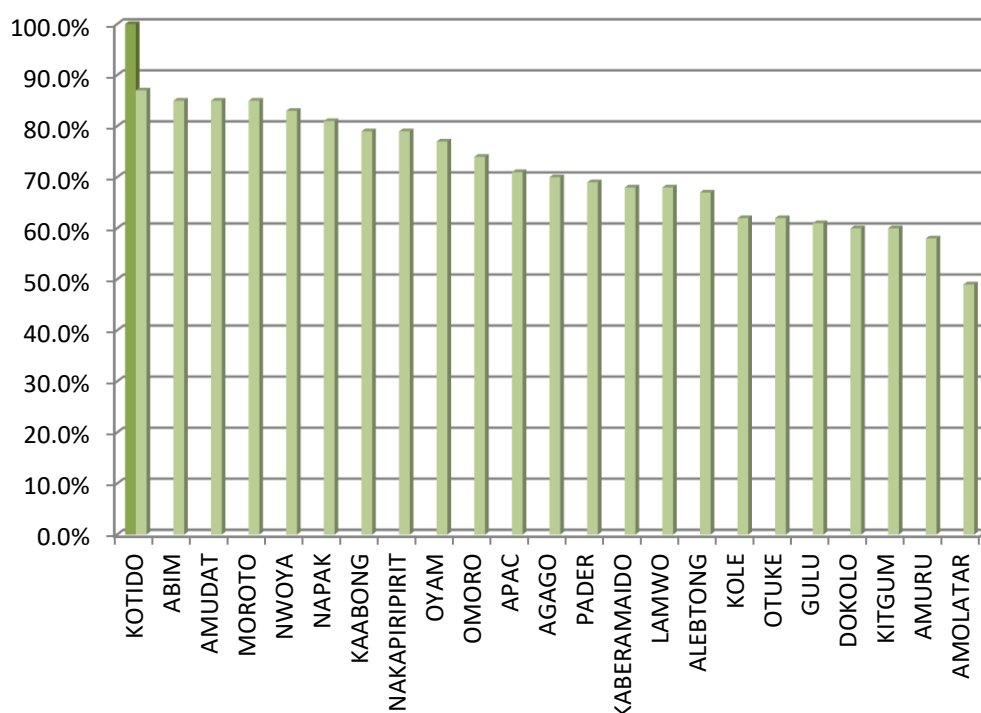


Photo 3: Proportion of households with a child under five who suffered from malaria in the past three months by district

Overall, 70 percent of the caregivers of children under five in the survey reported that a child under five in their household had suffered from malaria in the past three months. The highest reports of malaria in the past three months were recorded in Kotido (87.1 percent), Abim, Amudat and Moroto, all in Karamoja sub-region. Other Karamoja districts, Napak, Kaabong and Nakapiripirit also reported high incidences of malaria. In other regions, Nwoya, Oyam and Apac reported high incidences of malaria.

Seeking healthcare for children suspected of malaria

Various actions are taken by caregivers and household heads when they suspect that their children have malaria. They range from quickly consulting the VHTs, administering any drugs in the home, tepid sponging, and seeking care from health facilities. The type of action taken was reportedly also influenced by a number of factors, including: perceived severity of the suspected malaria case, availability of money at the time in the home, time of day, distance to the nearest health provider, etc. A majority (61.7 percent) of the caregivers whose children under five had suffered from malaria in the past three months reported that they sought care for the children within 24 hours; 33 percent sought care within two to three days; while 5.3 percent sought care in four days or more.

Table 9 shows the sources from which caregivers sought care for their under-five children during the most recent episode of suspected malaria.

Table 9: Sources of care for caregivers who sought treatment within 24 hours for child under five at last episode of suspected malaria

District	Public HF	PNFP	Private Clinic	VHT	Number
ABIM	84%	0%	8%	12%	26
AGAGO	65%	9%	5%	28%	46
ALEBTONG	73%	2%	37%	0%	46
AMOLATAR	80%	0%	30%	0%	11
AMUDAT	100%	6%	19%	25%	24
AMURU	59%	11%	4%	48%	33
APAC	72%	0%	13%	31%	105
DOKOLO	74%	0%	23%	5%	40
GULU	71%	10%	10%	19%	46
KAABONG	87%	7%	3%	23%	36
KABERAMAIDO	41%	0%	47%	0%	28
KITGUM	67%	20%	17%	53%	47
KOLE	65%	18%	47%	47%	87
KOTIDO	94%	0%	12%	24%	44
LAMWO	62%	6%	6%	18%	31
MOROTO	80%	0%	10%	65%	31
NAKAPIRIPIT	93%	0%	3%	21%	34
NAPAK	63%	13%	13%	50%	11
NWOYA	79%	3%	17%	31%	38
OMORO	57%	3%	17%	23%	35
OTUKE	100%	0%	0%	0%	22

OYAM	47%	0%	21%	45%	113
PADER	46%	0%	9%	54%	38
Total*	69%	4%	17%	29%	
Number	563	35	140	234	972

* Multiple responses allowed

As presented in Table 9, a majority (69 percent) of the surveyed caregivers reported that they sought care from public health facilities, followed by those who sought care from VHTs (29 percent).

From the FGDs, caregivers reported that in most cases, whenever their children manifest symptoms for malaria, they quickly consult VHTs for diagnosis and treatment because they are near to them.

“As soon as I have seen any signs that have shown on the child, I immediately go to the VHT”
(FGD caregivers, Namakora Sub-county, Kitgum District).

“For me who is near the VHT when I suspect that my child has malaria, I usually call them on the phone to help me out” (FGD household heads, Bobi Sub-county, Omoro District).

“When a child falls sick, here we first take them to the VHT then you can proceed to the health centre if there is no improvement” (FGD caregivers, Atiak Town Council, Amuru District).

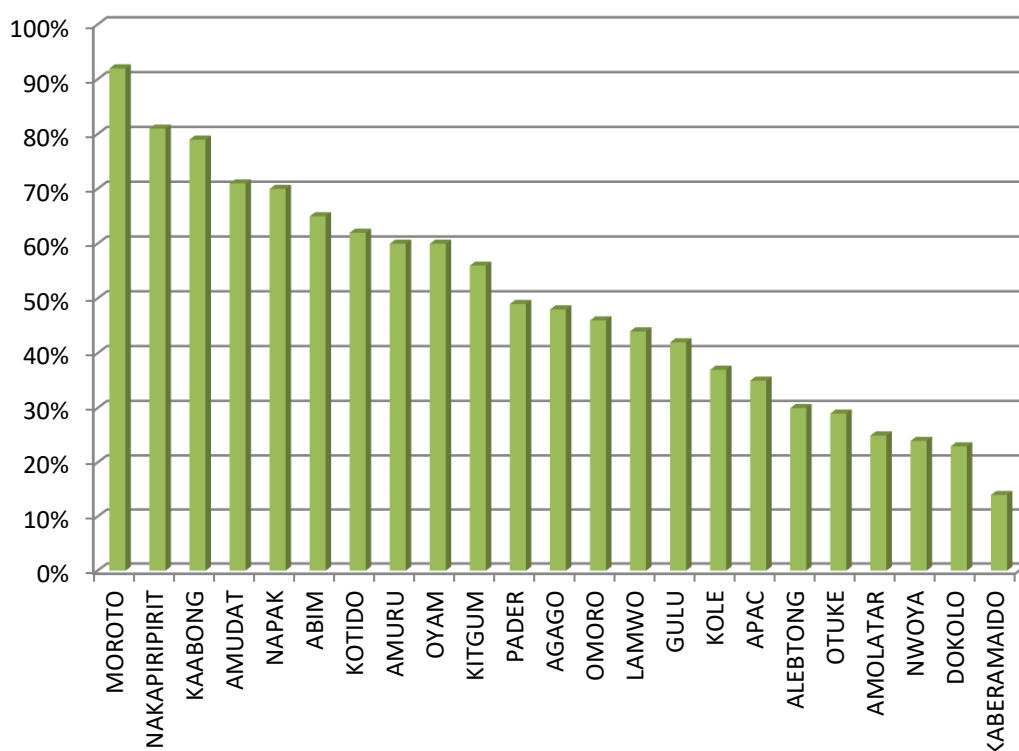


Figure 3: Proportion of caregivers/respondents who consulted a CHW/VHT in the past three months

Seeking the services of VHTs was most reported in the Karamoja districts of Moroto (92 percent), Nakapiripirit (81 percent), Kaabong (79 percent), Amudat (71 percent), Napak (70 percent), Abim (65 percent) and Kotido (62 percent). This could be attributed to the long distances to reach health centres in this region, as well as the fact that the VHTs in these districts have been trained in iCCM and equipped with drugs to manage malaria within the community. Consulting VHTs was least reported in the districts of Kaberamaido (14 percent), Dokolo (23 percent), Nwoya (24 percent) and Amolatar (25 percent).

Other caregivers reported that they first give any available drugs in the home, especially Panadol to first cool down the child's body temperature, and later proceed to the health facility. Others reported delays to seek care for children when they do not have money.

"In case I have some medicine like Panadol, if similar signs like before manifest, of say high fever, I first give the available medicine and monitor for a day before taking the child to the health facility" (FGD caregivers, Bobi Sub-county, Omoro District).

"If it is night time and the child gets signs of malaria, I look for some medicine like Panadol in the house and give it to the baby. Then I look for a motorcycle with the father to take the child to Alakas H/C II where they can give us more treatment" (FGD caregivers, Amudat Sub-county, Amudat District).

There were also some caregivers and household heads who reported that upon suspecting malaria they proceed straight to the health facilities. These are usually those who perceive that the malaria is very serious (child with danger signs) and they do not want to waste time by first consulting VHTs. They also know that this level of malaria would require a drip or admission, which are not available from the VHTs.

“I normally take my child immediately to the health facility because the more you delay with this child the worse the condition becomes. So as soon as the child starts complaining of headaches or anything else I run to the health facility so that tests are carried out to find out what is wrong with the child” (FGD household heads, Ogwete Sub-county, Otuke District).

Caregivers and household heads reported that when they consult the VHTs, they first administer a test for malaria and if the results are negative they immediately refer them to the health facility for appropriate management.

“Before we take the child to the health centre, we first take the child to the village health team at home because the VHT first tests the child for any disease, and if the medicine given by the VHT cannot work then we again go to the nearest health centre, or we will be told by the VHT that the malaria is too much and he will advise us to go to the health centre for medicine” (FGD caregivers, Nadunget Sub-county, Moroto District).

“For malaria, if the VHT is near, I take the child there to be tested but if he/she does not have the medicine, I immediately look for some money by selling a goat and then get a motorcycle and take the child to Loroo Health Centre” (FGD household heads, Laroo Sub-county, Amudat District).

Overall, caregivers and household heads reported that they respond quickly when their children manifest malaria symptoms, and seek care outside the home, either from the VHTs or health facilities. These responses were also influenced by a number of factors, including: time of the day, availability of transport, distance and perceived severity of the case, etc.

The survey noted that while many caregivers sought care outside the home for their children as soon as they noticed malaria symptoms, there were also many others who did not, for a number of reasons. Sometimes they think malaria is not serious and therefore the child can recover on his or her own without treatment, while others are discouraged by the long distance involved to reach the nearest health facility, and the frequent stock-outs of drugs and other supplies. These issues were most pronounced in Karamoja sub-region.

“I wait because of the nature of the sickness of the child because sometimes the child can recover alone. There is also the issue of the distance to the health centre. It is very far from the village and you have to walk about 15kms to reach there. It demoralises us to rush to the

health facility when our children are sick” (FGD caregivers, Lokopo Sub-county, Napak District).

“At least you wait for two days before going to the health centre from the day of the fever; if it improves you leave it, and if it worsens you take them to Lotirir health centre” (FGD caregivers, Moroto District).

“Children here in the community, when they are sick we don’t rush so we just wait. When they are very sick, then we can go to the health facility and find that there are no drugs in stock, so it becomes useless to go and come back bare handed without drugs those are the reasons why we wait”, (FGD caregivers, Lokopo Sub County, Napak District).

Key informants also reported that caregivers seemed to be using VHT services, as fewer cases of severe malaria were being received in health facilities.

“Utilisation has increased because currently at our facility we are no longer receiving so many cases of complicated malaria. Most of our patients are managed by VHTs at community level. These malaria services for the children are well utilised at the community level where we have VHTs managing uncomplicated malaria for the under-fives” (KII, In-Charge, Aduku HCIV, Apac District).

Compliance with VHTs’ treatment advice

This study also inquired into the compliance of caregivers to the treatment prescribed for the sick child. Most caregivers reported administering a full dose as prescribed by the VHTs or health workers because they appreciate its importance.

“I give the whole dose. And I will make sure he or she finishes all the medications given to me” (FGD caregivers, Nadunget Sub-county, Moroto District).

“The child has to complete the dose so that the child does not fall sick again, because the doctor is not stupid to give you that dose. The doctor says you have to make the child to complete the dose so that your child does not fall sick again. So for me I don’t preserve the medicine. I make sure that my child completes the dose given by the health workers” (FGD caregivers, Lokopo Sub-county, Napak District).

“... if the malaria is found and I am given the medicine in the health centre, then I make sure the child swallows the medicine until it is over” (FGD caregivers, Kotido District).

While many comply with the VHTs' or health workers' treatment prescription and administer the whole dose, others reported that they stop administering the dose when the child shows signs of improvement, and they keep the rest of the dose for the next episode of malaria in the home.

"Because the child is now okay you have to stop giving the medicine so that you can preserve for the next time when the child falls sick again. Then you give it, since the medicines are very expensive to buy and there is no money, and also in most cases the medicine runs out of stock at the government health centre so these medicines are very rare that is why I preserve it for the future use" (FGD caregivers, Lokopo Sub-county, Napak District).

"I will give the drugs to my other children when they fall sick or even share them with my neighbour's when their children are sick in the village, so it's the reason why I preserve the medicine for future use so I don't just waste the medicine when the child is feeling better" (FGD caregivers, Lokopo Sub-county, Napak District).

Similar practices were reported in some other districts such as Otuke. The project needs to address these practices.

Health workers also reported that some caregivers do not complete referrals when referred by the VHTs, for several reasons. These reasons include: the belief that the pre-referral treatment offered by VHTs is sufficient; perception that the illness is not that critical; long distances to health facilities in some of the districts, especially in the Karamoja sub-region; lack of transport means; poverty, which fuels the lack of money for transport; prior information that there are no drugs at the health facilities; and sometimes mere negligence or laziness on the part of the caregiver.

"...our people are still poor, they are still trying to recover from the long-standing war from Kony and the cattle raiders. So people prefer free things, but the commonest problem is that alcohol intake is so common among men and women that they do not engage so fully in productive things" (KII, Malaria FP, Otuke District).

Health workers also reported that some caregivers practice self-medication both for themselves and for their children. In such cases, caregivers tend to give medicines bought from drug shops, or kept at home, especially leftovers from previous illness episodes.

"...someone [a caregiver] before coming to the facility tells you that the child is vomiting and there is fever, then when you test the child for malaria with RDT the results will turn negative. Then the mother of the child tells you that before coming to the facility she had given the child some Coartem, then you ask where did you get the Coartem and they tell you

they had reserved some at home. This gives a picture that the antimalarial given them when a child is sick is not completed and they keep it to treat any future malaria” (In-Charge, Pajule HCIV, Pader District).

Drivers of caregiver and household head behaviour

From the above results, it emerges that the key drivers of caregiver behaviour in seeking treatment for malaria in their children include:

- Caregiver knowledge and health education received – for instance, caregivers who have been told by health workers to ensure that the child completes the dose of antimalarials are more likely to do that.
- Long distances to health centres – caregivers in the Karamoja sub-region were more likely to consult VHTs but also TBAs for antenatal advice because the health centres are located far away.
- The time of day/night when the illness is detected – caregivers are more likely to postpone care-seeking until the next morning if the illness is noticed in the evening or at night.
- Perceptions, knowledge and previous experience about the availability of medicines at health facilities – caregivers are unlikely to go to the health facility if they think there are no drugs at the health facility, based on information they have been given or on previous experience.
- Caregiver perception about the severity of the illness – caregivers are likely to postpone care-seeking if they perceive the illness to be mild or unserious.
- Poverty conditions – many may not have transport to travel to health facilities.
- Social cultural and gender factors – In some communities, it was reported that women need permission from their husbands to go to a health facility. In Karamoja region, it was reported that it can be a big challenge if the husbands are far away in the grazing areas.

“...here a pregnant woman might fail to come to the hospital waiting for the husband to come from the kraal to give her permission to come to the health centre” (KII, In-Charge, Kotido HCIV).

- Poor housing facilities and lack of proper beds make it difficult for people to use nets. Some of the houses have ceilings that are too low, while others are too small. Some people sleep on the floor and others sleep on improvised beds, which are not appropriate for net use.
- Fear of side-effects – some caregivers fear the side-effects of malaria prevention and treatment tools such as LLINs and IRS. Others resisted IRS on the grounds that it would interfere with their organic farming practices. It was reported that IRS faced stiff resistance in parts of Alebtong, Dokolo and Lira, especially in the sub-counties of Agali and Amach.

Male involvement in malaria prevention and control

Most family decision-makers reported that they are seriously concerned about malaria, mainly because they not only incur a lot of expenses on treatment when any of their family members falls sick, but also a lot of time is taken off their productive work to care for the sick. They also appreciated that sometimes malaria can be deadly. Consequently, most family household heads reported that they ensure that all the possible preventive means are done to prevent malaria.

“As family heads we ensure that all our people sleep under mosquito nets and we ensure we slash all tall grasses and destroy all the breeding places for mosquitoes” (FGD household heads Patiko Sub-county, Gulu District).

“I first ensure my children are under the nets, then my wife and last is me because sometimes I first go out to have a drink and when I come back I also join and sleep under a net” (FGD household heads, Bobi Sub-county, Omoro District).

The appreciation of the importance of mosquito nets in malaria prevention is further underscored by the willingness of the family decision-makers to buy or replace old nets for their family members, and the care they undertake to keep them safe.

“I roll it up in the morning and if it is dirty I wash it,” another participant added. ‘For me, I make sure I don’t smoke inside the net because it can catch fire’” (FGD HH Male Caregiver, Patiko Sub-county, Gulu District).

“For me I think it is my responsibility to buy new nets in case those ones got old” (FGD household heads, Apala Sub-county, Aleptong District).

This survey further noted that most FGD participants knew that when nets are scarce, children below five years and pregnant women should be prioritised because they are more vulnerable to malaria, owing to their low immunity. Nonetheless, some family heads hold a view that everyone is vulnerable and therefore should sleep under a mosquito net every night.

However, other key informants reported that men played a limited role in malaria prevention and health matters generally.

“I think men, if I am to rate them, it can be like 5 percent because in a day you can see like... if you are to consider children under five years of age, in a day you can see like 50 children but all of them will be brought by the mothers, maybe one father will bring [his children]” (KII, Clinical Officer, Abim Hospital, Abim District).

“In the inpatient ward, attendants for the under-fives are usually women, though a few men do come in to check on them and bring the other missing items like food, and a little money for buying small necessities while at the facility” (KII, In-Charge, Aduku HCIV, Apac District)

Re-use of old nets

Caregivers and household heads reported that they re-use old nets in different ways, including: for fishing, for making ropes to tether animals such as goats, as sleeping materials, as curtains, for catching white ants, for building purposes, for tying firewood, and as carriers on donkeys (reported in Napak). Others reported that they cut them into small pieces and used them as sponges for bathing and washing utensils. Others, particularly women, said they would use old nets for sitting on (in place of a mat).

Others reported that they use old nets in the garden to collect sorghum and sunflower, and for sieving crop grains from the chaff, while others use them in the brewing process and for making chicken houses. Some use them for protecting young crops and seedlings.

Others, however, said that they burn old nets or throw them in the rubbish.



Photo 4: Both old and new nets (in blue and while respectively) used for roofing houses in Amudat



Photo 5: Old net used as a strap / string in roofing a house in Kaberamaido



Photo 6: An old net used to hold grains in Kotido

Net replacement

Household heads reported that they would be willing to look for money to replace old nets. However, many considered that as a last resort and said they would first and foremost use the opportunity of their wives if they got pregnant again to get another free net at the health facility.

Indeed, some of the household heads argued that government should give them new nets when the ones they have get old. They claimed they are too poor to buy nets themselves.

R7: "We are poor, we do not have money, we wait for assistance from the government. The nets we are using were distributed to us freely. So they should help us again, in time before the ones we have get torn."

R6: "I think they should bring mosquito nets and store them at health centre, so that if yours get old you go and replace with the new ones and come back with the old net for making ropes"

(FGD, Male Household Heads, Adok Sub-county, Dokolo District).

The programme will need to address this attitude, and inculcate willingness to replace torn nets.

4.6.2 Practices and behaviour of caregivers of pregnant women

Pregnant women's practices regarding net use

They acknowledged that they have a mosquito net, which they received either at the first ANC visit, through mass distribution or after a DpT3 visit for immunisation of a child. Most, if not all, of them reported sleeping under it every night to guard against malaria.

"I sleep under a mosquito net to protect myself from malaria" (FGD Pregnant mothers Myene Sub-county, Oyam District).

"I make sure I sleep under a mosquito net every night" (FGD Pregnant Women Laroo, Division, Gulu District).

"We use the mosquito nets daily because the health workers say that we should ensure sleeping under the mosquito net daily to prevent the mosquito bites" (FGD Pregnant Mothers, Lokopo Sub-county, Napak District).

Sharing of nets was reported to be a common practice given that the households do not have enough nets for everybody.

"At my home all the members sleep under the mosquito net including young children and adults so the only issue is that we share the mosquito nets since there are not enough" (FGD Pregnant Mothers, Lokopo Sub-county, Napak District).

Pregnant women's practices regarding IPTp use

Under the current government policy, pregnant mothers are supposed to take Fansidar at the health facility (under direct observation by a health worker) whenever they go for ANC. The advantage of this is that it ensures that all pregnant mothers do not skip it, as opposed to before, when mothers would be given Fansidar to take when they got home, and some mothers would not swallow it. Table 10 shows the proportion of pregnant women in the survey and those with a child under three months who reported that they had attended ANC during the current/past pregnancy, and the proportion that took Fansidar for IPTp.

Table 10: Proportion of pregnant mothers and mothers with a child under three months who had attended ANC and taken IPTp

	Attended ANC during current / past pregnancy	Average number of times attended ANC	Taken IPTp during antenatal visits	Average times taken IPTp	Number

District	%	Mean	%	Mean	N
ABIM	68%	2	55%	2	15
AGAGO	63%	3	59%	3	22
ALEBTONG	81%	3	78%	3	43
AMOLATAR	79%	4	79%	2	27
AMUDAT	94%	3	93%	2	15
AMURU	83%	2	68%	2	19
APAC	80%	3	60%	2	49
DOKOLO	89%	2	84%	2	17
GULU	86%	3	77%	2	37
KAABONG	84%	4	94%	2	27
KABERAMAIDO	74%	3	80%	2	35
KITGUM	93%	3	86%	3	70
KOLE	90%	3	77%	2	28
KOTIDO	83%	3	85%	2	35
LAMWO	67%	2	56%	2	20
MOROTO	73%	2	81%	3	11
NAKAPIRIPIT	90%	3	86%	3	26
NAPAK	92%	4	92%	3	24
NWOYA	86%	3	78%	2	18
OMORO	69%	2	62%	4	18
OTUKE	52%	2	43%	3	13
OYAM	63%	3	55%	2	24
PADER	93%	3	86%	3	42
Total	81%	3	75%	2	635

The results in the table show that 81 percent of the pregnant mothers had attended ANC, with an average of three attendances. On the other hand, 75 percent had taken IPTp. Among those who had not attended ANC, the reasons given included lack of time, lack of money and long distances. The reasons given for not taking IPTp included not being given the tablets (31 percent), don't like the tablets (1 percent), not necessary (3 percent), preventing malaria in other ways (2 percent), and other reasons (53 percent). The other reasons included having not yet attended ANC, and that drugs were not available at the health facility.

Nevertheless, it can be noted that the coverage of both ANC and IPTp was fairly high. This could also be reflective of the national picture. The 2016 Uganda Demographic and Health Survey (UDHS) shows that 97 percent of the women who had a live birth in the past five years preceding the survey had received ANC from a skilled provider at least once for their last birth. Similarly, UDHS 2016 reports that 77 percent of the women with a live birth in the past two years preceding the survey had taken at least one dose of SP Fansidar. In the present study, the pregnant women who participated in FGDs reported that today, it is only in rare circumstances that mothers are given the IPT2 tablets to take at home, particularly when there are too sick. The majority of pregnant mothers swallow them at the health facility whenever they visit for ANC.

"They always give us from the health centre with water and then and we take it" (FGD Pregnant Mothers, Nadunget Sub-county, Moroto District).

"We have all swallowed that medicine because for as long as you have gotten pregnant and you go to the health unit, they just give you those three tablets and tell you to swallow from just there when the nurse is watching you. They can't tell you to take home and swallow, no they give you a cup and water from the health unit" (FGD Pregnant Mothers, Kakomongole Sub-county Nakapiripirit District).

"It's a must, you have to take it. If you don't take, then it means you have not gone to the health centre. They must observe you taking it" (FGD Pregnant mothers, Bobi Sub-county, Omoro).

While it is the practice for every ANC mother to swallow Fansidar at the facility, there are some exceptions, and mothers are given it to swallow when they get home. For example, sometimes they complain to the health workers of the side-effects of swallowing it without having eaten anything, etc, so health workers give it to them to swallow when they get home. However, it was reported that there are risks associated with taking the Fansidar away from the facility; for instance, the possibility that some mothers will not swallow it, with some just throwing it away.

4.6.3 Practices and behaviour of VHTs

The behaviour and practices of VHTs must be understood in the context of their assigned roles and mandates. According to the MoH VHT Strategy and Operational Guidelines (2009)⁴, the roles of VHTs include: health promotion and education, mobilisation of communities for utilisation of health services and health action, simple community case management and follow up of major killer diseases (malaria, diarrhoea, pneumonia) and emergencies, newborn care, community information management, and distribution of health commodities (MoH, 2009). Several VHTs who participated in the FGDs during this study discussed their roles specifically in relation to malaria control.

“Our major work as VHTs is to tell people to use mosquito nets in the villages to prevent malaria from attacking the children and their parents then also we tell them to clean around their homes and cutting the bushes to make sure that they maintain proper hygiene and sanitation” (FGD VHTs, Kakomongole Sub-county, Nakapripiti District).

“We prevent malaria through community education telling them to clear all tall grasses around their homes, destroying all breeding places, using mosquito nets and embracing indoor residual spraying” (FGD VHTs Lalogi Sub-county, Omoro District).

“We as VHTs in the community we teach that both children and adults to sleep under mosquito nets. Our surrounding should be clean and stagnant water is cleared to remove breeding grounds, containers or broken pots that hold water must be destroyed and cleared from our environment. Cough/pneumonia, we should take care of the children so that they do not suffer from cold, and for diarrhoea we should take good care of food” (FGD VHTs Padibe Sub-county, Lamwo District).

VHT practices in testing for malaria with RDTs

VHTs reported that they always conduct tests with mRDTs for any suspected case of malaria presented to them before they prescribe any treatment or referral.

I have been trained for iCCM ... we have all the requirements for treating malaria, like drugs, RDT, gloves and if any child under five is sick we first test if I find that the child has malaria then I give the drugs and if the child takes three days I go and visit the child and if there is no improvement then I refer the child to the health centre III (FGD, VHTs, Amida Sub-county, Kitgum District).

As a VHT, when a child is sick, they bring those children to us, we then use RDT test kits to find out the child's condition for malaria, when you find that the results are positive, that is

⁴ Ministry of Health Uganda (2009): Operational Guidelines for Establishment and scale up of village health teams. Kampala.

when you give them treatment and if the results are negative, you can give them a referral if the condition is not well (FGD, VHTs, Alerek Sub-county, Abim District).

Similar reports of VHTs using RDTs and being trained by agencies such as PACE were received in Kaabong, Agago, Nakapiripirit and other districts

Most VHTs who had been trained in using RDTs could easily outline the procedure or steps they follow while testing for malaria using an mRDT.

“When a patient comes what I do is a first touch the child with the back of my hand, if I find fever, I open RDT pack and put on a table, before I pick blood sample I put on hand glove the pricking equipment. I get clean the figure that I want to pick and draw blood. After drawing blood, I drop it in the middle point of RDT and get buffer that will push the blood along the line after some minutes it will bring result in the following ways. The first one you will get one slide that shows negative, then when the line, slide twice that shows the patient is positive. This is how we use RDT” (FGD VHTs Lalogi Sub-county, Omoro District).

“You tear from this corner to remove the RDT, take the alcohol swab and clean around the finger, take the needle and then prick the tip of the finger once and squeeze out the blood. Put blood sample in this hole and add in some liquid I have forgotten the name of the liquid. You make two drops and then wait for about ten to fifteen minutes while you give the caregiver or the parent advice. If it shows two lines, it means malaria is positive but if I show one line then the child is negative or does not have malaria” (FGD VHTs, Patiko Sub-county, Gulu District).

The current malaria treatment regime also emphasises referral of malaria cases with negative mRDT results as well as children manifesting danger signs such as anaemia, convulsions and vomiting to the nearest health facilities for appropriate management. Results of this survey indicated that VHTs are largely complying with this and in addition to writing a referral form, some VHTs are following-up on referred cases. Before referral, VHTs first discuss reasons for referral with the caregiver and encourage them to go immediately. Some VHTs reported following-up on referred cases to see how their clients are faring.

“As VHTS when we treat a child and there is no improvement, we give referral form to the health centres to get support we as VHTS can’t provide, we also make follow up to see how they are improving from sickness” (VHTs Lalogi Sub-county, Omoro District).

“We follow them up to the health Centre to see whether the person reached the health Centre and was given treatment” (FGD VHTs, Patiko Sub-county, Gulu District).

“My work as the VHT includes doing a follow up for instance when I give referral to somebody with malaria to the health centre I make sure I follow up whether that person has reached the facility” (VHT, Amida Sub-county, Kitgum District).

Some of the VHTs (e.g. in parts of Dokolo, Otuke) said they had heard about RDTs but never use them.

VHT practices in the treatment of malaria

VHTs in most districts reported that they had been trained to treat uncomplicated malaria in children using Coartem. They reported that they first test with RDTs before they prescribe or administer Coartem and Panadol to reduce the fever. They refer cases that present signs of severe malaria

When we receive children suspected to be suffering from malaria we test them using RDTs rapid diagnostic test for malaria and when we find that they are positive we treat them with Coartem and Panadol if in case the patient is having severe malaria we refer them to the nearest health facility for proper medication and management (FGD, VHTs, Lokopo Sub-county, Napak District).

“We have Coartem for only young children, those who are under five years of age, (FGD VHTs, Kakomongole Sub-county, Nakapiripiti District).

Some VHTs explained the dosage they follow to administer or prescribe Coartem to children.

...children of one month to two years old then I give the yellow ones (Coartem) One in the morning and one in the evening for three days that is enough and others can add. ... For three years the blue Coartem is given, 2 in the morning and 2 in the evening (FGD, VHTs, Nadunget Sub-county, Moroto District).

The survey, however, noted that in areas such as Acholi and Lango, VHTs do not have stocks of Coartem because PACE, who was supporting iCCM, has closed its operations in the area. VHTs still have some stocks of Coartem in parts Karamoja.

As a result of stock-outs of both Coartem and mRDT kits, most VHTs are not currently offering treatment for uncomplicated malaria cases brought to them. They are instead providing referral for most of the malaria cases that are brought to them.

“We receive but it is on and off. At times you stay for two to three months or even more without drugs but at times you can have it continuously” (FGD VHTs, Patiko Sub-county, Gulu District).

Referrals by VHTs

VHTs who participated in FGDs reported that they usually refer suspected cases of malaria if they cannot handle them. Referral is usually done in cases where VHTs do not have antimalarials, if they suspect severe malaria, or if the illness persists after treatment. They also reported that they refer cases if the patient has other conditions such as anaemia.

For malaria, if you test and realise that the RDT is positive, you treat and if there is danger signs, you refer to the hospital, (FGD, Male VHTs, Alerek Sub-county, Abim District).

When a child begins getting the signs of malaria, we immediately test the child and if the results are positive, we treat there and then and also if the results are negative and the child has such symptoms, we immediately refer the child to the nearest health center (FGD, VHTs, Kakomongole Sub-county, Nakapiripirit District).

Sometimes the child even begins to collapse from nowhere and the eyes turn yellow and sunken, you really notice that the child really looks malnourished and without blood in the body. For such a case, we cannot even tamper to touch it all we can do is to give some pain killers and quickly refer to the nearest hospital for better treatment by the doctors (FGD, VHTs, Kakomongole Sub-county, Nakapiripirit District).

VHTs reported that for every referral, they fill in a referral form or note and hand it to the caregiver to carry along to the referred point. The purpose of the referral note is only to get immediate attention at the referred point but also to indicate what treatment has already been administered to the referred patient to guide further management. The referral note also helps the VHTs know whether the patient reached the referred point. VHTs noted that the referral form or note also enables them to follow up on the referred patients because part of the form is sent back to the VHTs. However, many VHTs reported that they do not have referral forms and instead write the referral advice on any piece of paper they can find.

VHTs noted that when they refer cases to caregivers, they follow up to find out if those referred have received treatment and how they are responding.

“Even if we give referrals, we still follow the child to the health centre to see if they reached and have been helped. Find out if medicine was given and also find out if the dose given has been completed. For example, there was a mother I referred her child to the health Centre but this mother does not always give her child complete doze and when we realise, we made her take the child to the health centre every morning, afternoon and evening so that she does not forget again” (FGD VHTs, Patiko Sub-county, Gulu District).

VHTs noted that they do not only advise on referral but also sometimes go the extra mile to follow up on the referred patients at the point of referral and at home to offer any needed support.

“When I refer a child to hospital, and when the child has been administered these drugs, when they come back home it’s my work to go and visit them so that I make sure that this child has swallowed these medicines and completed the dose” (FGD VHTs Kapedo Sub-county Kaabong District).

“Sometimes, we even accompany them to the health facility to make sure that they have followed our instruction” (FGD VHTs, Kakomongole Sub-county, Nakapiripirit District).

“We usually also follow up to ensure the child is taken to a health facility because other caregivers say we are going home to pick clothes and the refuse to take the child to health facility, we nor usually accompany them immediately to the health facility” (FGD VHTs, Oyam District).

Despite the fact that VHTs first discuss the need for referral with caregivers, they reported that caregivers do not always follow the advice of referral given to them. There are a number of factors responsible for this, including the lack of funds to meet the costs involved in referral, a lack of understanding of the reason why referral has been advised, long distances to the referred point, perceived delay and poor quality of care at the referred point due to stock outs and other such issues.

“Other caregivers don’t comply because of distance; they fail to go because they don’t have money for transport” (FGD VHTs, Patiko Sub-county, Gulu District).

“So when they go there (health facility) they come back and accuse us that we sent them there and yet did not find the drugs”

“Other caregivers are ignorant and even if you refer, they still don’t go; they think the child will recover from home until the child become worst then they go when it’s too late” (FGD VHTs, Patiko Sub-county, Gulu District).

Besides treating uncomplicated malaria cases among children under five, VHTs are also trained to treat diarrhoea using oral rehydration salts and zinc tablets and pneumonia with amoxicillin tablets.

Drivers of behaviour among VHTs

The key drivers of behaviour among VHTs included:

- Training in the various roles and procedures that they need to undertake such as administering rectal artesunate, using mRDTs, and making referrals. Some of the VHTs who were last trained many years ago are not familiar with recent treatment guidelines and procedures, while some have forgotten what they were taught
- Availability of anti-malarials and other supplies such as mRDTs, gloves, etc.
- Ownership of a bicycle or means of transport
- Partner agencies that provide refresher training, facilitation, drugs and supplies
- VHT assessment of the child's condition / severity of illness
- VHT assessment of the possibility/ability of a caregiver to complete referral
- Level of motivation, which is a function of many factors including training, facilitation, and regular contact and supervision by health facility and local government staff.
- Linkages with health facilities and partner agencies

Challenges faced by VHTs

VHTs reported encountering a number of challenges with regards to malaria treatment and prevention

One of the key challenges was stock-outs of both drugs and mRDT testing kits. At the time of the survey, in most districts, VHTs did not have stocks of Cortem and mRDT kits. This was hampering their efforts to serve their communities and as a result, all cases presented to them including those they could handle were instead referred to the health facilities. The same challenge was discouraging caregivers to seek care as VHTs could not provide any services. Reports indicate that in the Lango and Acholi sub-regions, VHTs last received supplies in March of 2018 and by the time of the survey, few or none of the VHTs had any supplies. Some VHTs reported that caregivers sometimes get annoyed with them, or accuse them of stealing the drugs if they do not find the drugs available.

"I face difficulties with some mothers when they come and I do not have any drugs. They don't understand it and they get annoyed with me and begin to ask questions as what is our purpose because we cannot serve them" (FGD VHTs, Padibe West Sub-county, Lamwo District).

"The major problem that I am facing in my village is drug stock out and as I talk there is no drug in my village yet these parents when they bring their children they need treatment from us and when they fail to get medicine they start saying that we have stolen the medicine and yet we have been given drugs in March this year and they got expired and we are no longer using them" (FGD VHTs, Amida Sub-county, Kitgum District).

The failure of VHTs to meet the expectations of caregivers when drugs have stocked out was found to decrease the level of trust and confidence that community members have in VHTs. It also affects the self-confidence of VHTs.

“We were given drugs only once but the community keeps coming to us. So sometime I think my work is worthless ...” (FGD VHTs, Lalogi Sub-county, Omoro District).

“Caregivers trust us but their trust diminishes when they come and do not find drugs. Instead refer them to the health facility. So this is one other challenge we experience” (FGD VHTs, Padibe West Sub-county, Lamwo District).

The absence of means of transport was given as a reason for a decrease in VHTs’ effectiveness, particularly in regards to home visits. Some VHTs are in charge of large villages and have to visit them routinely to advise them on good health practices. Consequently, without means of transport, VHTs were reportedly not reaching out to those who are far away from their residence.

Another challenge is the lack of facilitation in terms of other basic supplies and equipment to improve the VHTs’ work. These include raincoats, gumboots and torches. VHTs complained that some caregivers come to them at night but they do not have light or a torch to attend to them. They therefore often do so in darkness, which may compromise the quality of care given to caregivers.

Another challenge pointed out by VHTs relates to administering an mRDT to children. VHTs felt that there are risks involved because one may prick him or herself in the process and acquire diseases associated with blood drawing such as hepatitis B, HIV etc.

Lack of stationery and other materials such as registers was pointed out as a key challenge for VHTs, including those who implement iCCM in the Karamoja districts.

One major problem we face is that you find that the iCCM registers we were given are all now filled up and we have resorted to writing in ordinary books. Our referral forms also get over and we also just have to write in pieces of paper just to refer these patients. Even writing materials like pens are not provided and this hinders our work (Male VHTs, Kapedo Sub-county, Kaabong District).

Some VHTs live far from the health facility and they complained of the long distance they have to cover in case they have to pick up supplies (drugs and mRDT kits) or attend meetings. They complained that they are not given any means of transport such as a bicycles or a refund to cover the costs of transportation every time they make such trips to the health center. Similar concerns about means of transport were also raised with regard to community mobilisation for health activities where the VHTs have to move from one household to another.

The lack of incentives also featured prominently as a challenge amongst VHTs. They reported that while they play an important role, the government does not appreciate them. They felt that while they work voluntarily, they need to be given some incentives such as airtime, soap etc. A lack of

these incentives was reportedly demoralising VHTs to perform their expected role at community level.

Some VHTs also reported a heavy workload because there are too few of them compared to the number of villages they have to serve. They are consequently left with little time to attend to their other household obligations while working voluntarily

The other challenge relates to the fact that VHTs only offer treatment to children under five but other community members also fall sick. VHTs reported that they are consistently being disturbed by other members of the community who want to know why they are not offered treatment.

“People disturb us they blame us for treating children only. They say diseases do not discriminate whether one is young or not” (FGD VHTs, Lalogi Sub-county, Omoro District).

VHTs and health workers also expressed concerns that most VHTs do not have proper storage facilities for RDTs and other supplies. As a result, it was feared that RDTs may give invalid results if poorly stored.

Lastly, VHTs also reported a lack of community support for them. Communities do not support VHTs other than a verbal ‘thank you’ whenever a service is offered to them. It was reported that community members take it as a right to be served by VHTs. Others think VHTs are paid by the government and there is therefore no need for them to support VHTs.

4.6.4 Practices and behaviour of DHMT and health facility workers

Health worker practices in the treatment of uncomplicated malaria

Health workers also reported that they treat uncomplicated malaria with Coartem after confirming with an RDT or microscopic test. Whereas health workers generally reported that they follow the policy of test and treat, and therefore endeavour to first test with RDT all suspected cases of malaria, some challenges were reported which make it difficult to follow this policy. The major reported challenges revolved around lack of adequate stocks of mRDTs.

“Of recent we used to do RDT for malaria in all the wards including OPD, inpatient, ANC among others. Because our OPD closes at around 5:00pm, so if a patient comes at night or beyond 5:00pm with signs and symptoms of malaria, we would do tests from the inpatient. But currently, we have a reduction in stocks for RDT and we are only doing microscopy. Those who come late, we are referring them to town to do RDT diagnosis and return the results back to us” (KII, In-Charge, Aduku HCIV, Apac District).

“... our budget line cannot allow us to request for enough test kits especially the RDT, to meet the burden of fevers, testing for fevers and so sometimes we are forced to go against the policy of tests and kits and we start treating clinically something which is not acceptable by now. Sometimes we borrow the test kits from the lower facility and then they still get

exhausted and you don't get anything and it is a challenge to us so I don't know how we can be able to address that" (KII, In-Charge, Kotido HCIV, Kotido District).

Health workers practices in managing cases of severe malaria

Health workers reported that they treat children with severe malaria using IV artesunate. Depending on the condition of the child, they may give rectal artesunate to stabilise the child. Health workers were able to discuss what they typically do when they receive a case of severe malaria:

In the management of severe malaria like for the under 5s when a caregiver arrives with a child, we take the history of the illness after the history, we do physical examination, request for laboratory investigations, when it is a confirmed case of severe malaria, we counsel the caregiver about the need of the child being treated under observation of the health work for 24 hours i.e. the need or being admitted. We treat the child using IV artesunate, we also go ahead to manage other conditions like if a child has high fever we give antibiotics and encourage the caregiver to do sponging. For the weak children, we give them dextrose majorly we give 25 percent. If the child is anaemic and we have confirmed from the BS investigations, since we don't do blood transfusion, we immediately refer a client where the service is available (FGD, Health Workers, Aduku HCIV, Apac District).

R.1 We consider it as an emergency, we sort them from the triage, the child is taken to the assessment room and physical examinations are done. Since we don't have a lab at HC/II an RDT is done, if the complications are so severe we immediately refer to HC /III or IV.

R.3 To add on what my colleague has said, if the child has complications, we manage them as the referral is being worked on i.e. if the child has high fever, we give antibiotics, if the child is convulsing, we use anti-convulsing drugs to normalise the condition. Therefore, we give pre-referral treatment.

R.2 Under pre-referral treatment, we use rectal artesunate. We can also use zinc and oral rehydration salts if the child is hydrated because sometimes, severe malaria is coupled with diarrhoea (FGD, health workers, Abwong HCII, Apac District).

In this KAPB survey, we observed 87 incidents of health workers managing a case of suspected malaria. The results are shown in Table 11.

Table 11: Observed health workers' practices in management of cases of suspected malaria in children under five

Health worker actions	Yes (percent)	No (percent)	Number
Asks about the child's illness history	98.9	1.1	87
Asks about the medication already given to the child	70.1	29.9	87
Takes child's weight	62.7*	37.3	87

Takes body temperature of the child	44.2*	55.8	87
Checks the eyes of the child	69.0	31.0	87
Checks/asks for signs of severe malaria	57.0	43.0	87
Requests for lab test for malaria	93.0	7.0	87
Explains the diagnosis made to the caregiver	90.8	9.2	87
Asks if child sleeps under a mosquito net	47.0	53.0	87
Provides first line treatment for malaria if no danger signs are identified	76.7	23.3	87
Explanation made to the caregiver about how to administer the medicine	100.0	0.0	66
Admits child and administers treatment for severe malaria	29.1	70.9	87
Refers severely ill child promptly if unable to treat	25.6	74.4	87
Diagnosis made:			
Uncomplicated malaria	79.1		
Severe malaria	16.3		
Not malaria	4.7		
Not known	1.1		
			87

**Note: Some of these processes were already done at triage stage*

The results in Table 11 show that almost all (98.9 percent) of the health workers who attended to cases of suspected malaria asked about the child's illness history. However, only 70.1 percent asked about the medication already given to the child, and an almost similar proportion (69 percent) checked the eyes of the child. Overall, these results indicate that while a majority of the health workers undertake all the essential procedures in the management of suspected malaria, some do not.

In addition, we in this study observed 67 incidents of health workers attending to mothers that had come for ANC. The results are shown in Figure 4.

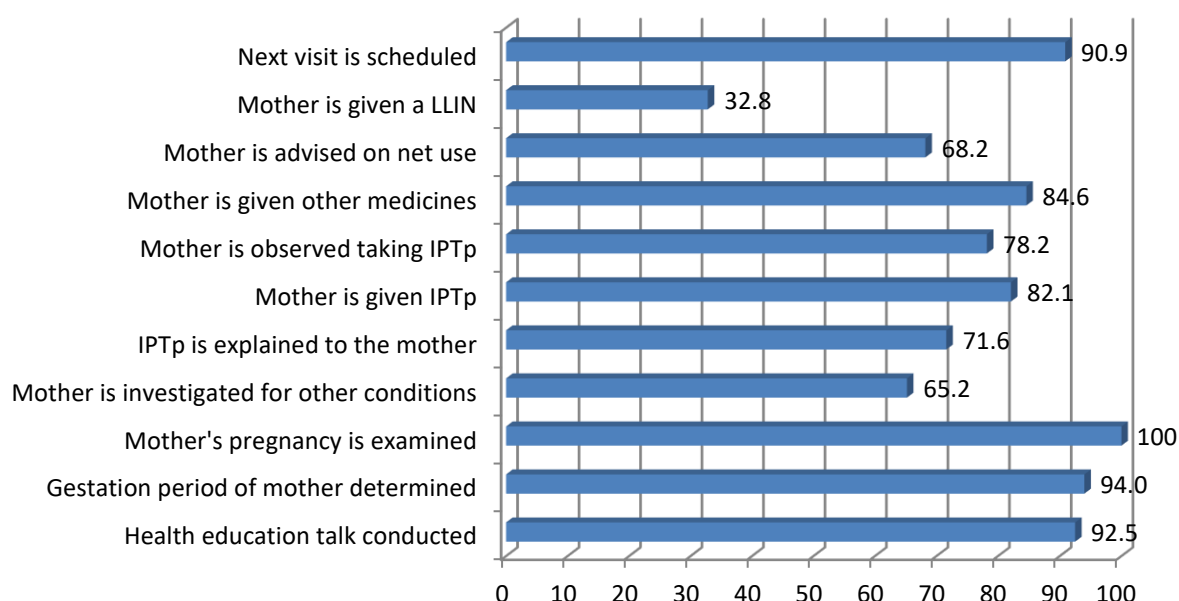


Figure 4: Health workers' practices while attending ANC mothers

(N=67)

The results in Figure 4 show that the majority of health workers who attended to mothers seeking antenatal care performed most of the critical actions expected at an antenatal visit. Nevertheless, there were salient gaps observed. For instance, only 32.8 percent of the mothers were given LLINs. In addition, whereas 82.2 percent of the mothers observed were offered IPTp, only 78.2 percent took the medication under the observation of the health worker.

Drivers of health worker behaviour

Health worker practices and behaviour were found to be influenced by a number of factors. In districts such as Abim, district key informants reported that health services in government health facilities had generally improved over the recent past, due to an increase in the number of health workers, having a network of VHTs, and the availability of diagnostic equipment.

However, in some districts it was reported that not all health workers have been trained in different aspects of malaria management. For instance, it was reported in some districts that some health workers are not trained in managing complicated malaria.

... not all nurses and clinicians in this hospital have received the current updated trainings on handling complicated cases of malaria therefore there is need for that (Clinical Officer, Apac District Hospital).

Another key factor affecting health worker practices was the issue of infrastructure. In several places, health workers and DHMTs reported inadequate or inappropriate infrastructure rendering them unable to do their work.

We don't have a special organised room for our laboratory. Right now some of our buildings are under renovation therefore using a microscope to diagnose malaria is complicated. As well as running a CDC test for pneumonia is hard because we have nowhere to place the equipments, yet most cases of severe malaria are associated with pneumonia (Clinical Officer, Apac District Hospital).

Availability or shortage of supplies is another key determinant. Whereas for instance health workers know that they are supposed to first test all suspected cases of malaria before prescribing treatment, sometimes this is not possible due to a lack of RDTs.

Sometimes we experience stock out of supplies like RDTs and reagents yet by standard guidelines from the MoH. We are not allowed to treat any suspected cases of malaria before diagnosis. Even if you see all the symptoms of malaria you cannot prescribe treatment because it's wastage of drugs and sometimes fever can be due to other illnesses other than malaria (Clinical Officer, Apac District Hospital).

We do run out of stock of artesunate for pregnant women and under-five's, yet quinine has negative effects on them. It becomes a challenge for us to handle complicated cases of malaria since clients cannot afford buying from private clinics (Clinical Officer, Apac District Hospital).

Training was found to be another determinant of health worker behaviour. This study found that there were variations in access to training as well as the type of training received across the 23 districts. In Abim and Moroto for instance, it was reported that health workers had recently received training in integrated malaria control.

Challenges in the referral system

Various challenges in the referral system were reported. These include the lack of transport for patients between referral points, late completion of referrals by caregivers, and cultural beliefs which affect the interpretation of illness. Regarding the latter, for instance, it was reported that in some communities, convulsions due to severe malaria are interpreted as epilepsy, hence delaying care seeking even when referred. In terms of transport, many health facilities reported that they do not have ambulances and therefore advise the caregivers to use public transport. In several cases, the caregivers may not have money for public transport. Health workers also reported that many patients referred to them come with no documentation, making it difficult to know what medicines they have already taken.

4.6.5 Practices and behaviour of other institutional actors

Effective malaria control requires a multi-sectoral and multi-actor approach, by which different actors, whether individuals and institutions (both public and private) work together in a

complementary manner to address the threat of malaria. In this study, we talked to other institutions outside the health sector but whose activities may contribute to the spread of malaria and therefore have a role to play in malaria control. These included heads of schools, police, prisons, road contractors, and heads of the departments for Agriculture, Engineering, and Education at the district level.

Road contractors

Road contractors open up big excavations when they are digging for gravel or stones, opening up road drainages or diverting roads. If these open pits are not refilled, they provide breeding grounds for mosquitoes. Road contractors reported that in many cases, they refill and restore the pits from which they excavate gravel and other materials.

The other thing that we are doing is to restore the barrow pit after excavation of gravel to avoid water logging which would act as a breeding place for mosquitoes (KII, Road Contractors, Kileleshwa District).

However, road contractors also acknowledged that while they make efforts to refill these sites, sometimes the ground does not get levelled and rain water may collect and stagnate in these places. In other cases, the pits and trenches may remain open for a long time before they are refilled. These then provide breeding grounds for mosquitoes.

We contribute to the malaria problem by digging up holes which serve as breeding grounds for mosquitoes. During road construction we dig up trenches which at times we take long to cover and others due to financial constraints we don't cover at all. Some houses and schools or health centres you may dig the foundation but due to financial problems the project is put on hold, so you find that those serve as breeding grounds for mosquitoes (KII, Road Contractor, Kilifi District).

Road contractors also move to places where they have work and set up camps or rent houses for their workers. The road contractors we talked to in this study admitted that in many cases, they never bother about whether their workers in the camps or rented premises have malaria prevention tools such as mosquito nets. The workers without nets end up getting malaria which affects their performance on the sites and ongoing works.

"For us contractors, when we go for construction work, we most times rent for the workers houses and spaces to sleep and some of these places do not have mosquito nets and we are not bothered about the absence of nets and about the surrounding environment like bushes. Some of our own workers end up getting malaria in that process which affects their productivity and output. What helps us is that some of these workers are clever; they carry their own nets whenever we are going for such works that require us to sleep over for many days" (KII, Road Contractor Nwonya District).

Road contractors have no organised malaria control activities. A major gap in the district procurement procedures was identified. It was also indicated that while the bills of quantities (BOQs) categorically state the activities that contractors must undertake to prevent HIV infections, the same BOQs are silent on what contractors need to do to prevent malaria infections. Consequently, contractors are under no contractual obligation to undertake any malaria mitigation measures.

Nevertheless, contractors expressed willingness to incorporate malaria control activities in their work, if the district procurement processes demand so.

“As contractors we are not given specific budget that involves malaria prevention but if district guidelines come out and spell out specific activities we need to do like it is the case for HIV/AIDS at least we can design something in line with malaria control. (KII with the MD of a construction company Abim District).

Police and prisons services

Some of the prison authorities interviewed reported that their cells have ventilations which have no nets, thus allowing mosquitoes in and exposing the inmates to the risk of malaria. The police also reported that their staff are at a great risk of malaria because they are bitten by mosquitoes during night duty but cannot use nets while on duty.

Prison authorities in some of the districts reported that they provide some nets to the inmates. However, in others it is not even possible for inmates to use nets even if they were available because of the small space in the cells and the congestion. Some prisons reported that they have up to 200 inmates in one cell, which makes the use of nets practically impossible. The majority, however, did not have these nets at all. The inmates that have no nets have high chances of getting infected with malaria which the prison authorities thought was not good.

“The prison here serves this whole community and has a confined cell with sometimes up to 200, 180 inmates, but now we have 130. Around April- May, we were given nets and we gave them to the women in the women’s wing ... because the number is small. ...they are 8 women in the women’s wing. The men’s wing has many inmates and there is no way because there is no space and no way can hang the nets” (KII, OC Station, Pader Prison).

Overall, the prison authorities acknowledged the risks for malaria infection that their inmates are exposed to, and requested for support to implement malaria control interventions. Requested support includes nets for ventilators, and support to undertake IRS.

There are also sprays for example those used in indoor residual spraying that exist and which we can access if helped by some of the partners to spray our cells to prevent malaria” (KII with the DPC Amudat).

Schools

It was found that most schools are implementing malarial preventive measures including slashing of grass and bushes around the school, educating pupils / students about malaria and its prevention and control, removing empty containers, and discussing or giving performances about malaria in school health clubs. Boarding schools also ask students to bring mosquito nets. In some of the boarding schools or boarding sections, they have made it a policy for all children coming to school to turn up with a mosquito net among the school requirements. However, children from poor families may not bring nets due to lack of funds to buy a net. Some schools even have their own net campaigns where they encourage children to sleep in nets. This has helped inculcate net usage in schools where these are done.

“Through inspection, we can see that there are preventive measures in schools like slashing the compound and removing empty containers and burning them. Some of the children in the boarding schools come with their own nets. But these would be those from well-to-do families” (KII, DEO Nakapiripirit District).

“In this school it’s a policy for all children in the boarding section to bring a net. On the first day of school when you are coming you have to present your net which is still functional because I remember there was a year when some of them just came with nets that were torn. ... when you go in our dorms there, you will find mosquito nets hanging upon each sleeping space” (KII, Head teacher, Broadway Private Boarding Primary School, Lamwo District).

However, it was reported that many students are careless with their nets and they get torn in one term. Some schools reported that they encourage the students to sew and repair their torn nets.

Most schools also have a clinic and a nurse, whereby students who get malaria are treated. Others invite health workers to come and give talks about malaria.

... medical personnel from the nearby health facility also come to this school and sensitise our children further on among others how to prevent malaria in this community” (KII with the head teacher Ajulu primary school Gulu)

There are some schools with health clubs where students interact and engage each other on ways of preventing diseases including malaria. These clubs sometimes invite resourceful people to discuss various topics to students in assemblies. There are also health parades to ensure the health of their

colleagues. In addition, music dance and drama activities including the use of poems are also being undertaken in many schools and these are normally performed on school open days to sensitise not only the children but also the parents on net usage and other malaria preventive measures that one can undertake in the community. The areas where mosquitoes breed from are well articulated in these activities including the actions that can be taken to prevent malaria.

“We as a school, we compose some music dance, drama and poems, about malaria which are performed during school functions, through which we sensitise children and parents about malaria (KII with the head teacher Ajulu primary school Gulu).

“... we have health clubs where students discuss a number of ways of preventing these other diseases including malaria. Then two as I told you before, we always invite resourceful people in the area of health to advise students on malaria, HIV/AIDs and other diseases. Through assemblies we talk about health related issues on Monday, Fridays. They do health parades to ensure their bodies, sleeping spaces and surroundings are all clean. Those with torn nets are advised to stitch them” (KII with the headmaster Nadunget SS Moroto).

However, no specific malaria clubs were found in schools.

It was however also found that some of the schools are constructed in or near swampy areas, which provide breeding grounds for mosquitoes. For some of the schools constructed in swampy areas, it is possible that their location enhances the threat of malaria if other preventive measures are not implemented.

Some of the schools in the district especially those in the swamps have many cases of their pupils and children suffering from malaria and they fall sick quite often.” KII with the DEO Nakapiripirit

Agricultural sector

Key informants from the agricultural sector revealed that agricultural activities such as reclaiming of wetlands for agricultural purposes and opening up of bushland for farming, including rice farming, interferes with the eco-system and creates open grounds for the breeding of the anopheles mosquitoes. Such activities were reported to be widespread in the survey districts. They also stated that the footmarks of animals such as cows collect rainwater and provide breeding grounds for mosquitoes.

Key informants from the agricultural sector also acknowledged the negative effects of malaria on their sector, and reported that they endeavour to incorporate messages on malaria control and good nutrition into their work.

... we know that if our people are to produce good harvests they should be healthy. We incorporate such information; we do tell our people to avoid malaria because once you have someone who is sick in the family it affects production even if such a person is a child who is not providing any labour in the garden but you will spend a lot of time here and there seeking treatment for the sick household member hence negatively affecting production. Even the little financial resources available in the household will channelled, into clearing the medical bills and other costs. So we tell them that directly or indirectly malaria affects production at household level in a long run (KII, District Agricultural Officer, Apac District).

We are advising our people to have a balanced diet because a person who is not eating well, his or her immunity against malaria is low so we are encouraging our people to have a balanced diet. Or even when a household member has been infected with malaria and is on treatment such a person needs to eat well. So we advise them to grow personal fruits because the sick person will need something to drink. We tell them to grow vegetables and include them on their daily meals. Good nutrition enables the victim of malaria to regain strength and recover within a short time (KII, District Agricultural Officer, Apac District).

Brick-making

Key informants also reported that activities which involve excavation of soil such as brick-making leave open grounds that collect water and provide breeding grounds for mosquitoes. It was noted that activities such as brick-making have increased in recent years, partly as a result of government and non-government economic empowerment programmes that target youth groups and give them support to undertake brick-making.

Overall, actors in other sectors such as road construction and agriculture acknowledge that they contribute to the spread of malaria by providing breeding grounds for mosquitoes. All other actors and institutions also agree that malaria control requires a multi-sectoral effort. The police and prisons request for interventions that can protect their staff while on night duty. The road contractors request for the districts to consider their budgets including a component for malaria control.

4.6.6 Exposure to Information about Malaria

Overall, 64 percent of the respondents in the survey reported that they had seen or heard a message about malaria in the past six months. Figure 6 shows the proportion of survey respondents who had heard or seen such a message in the past six months by district.

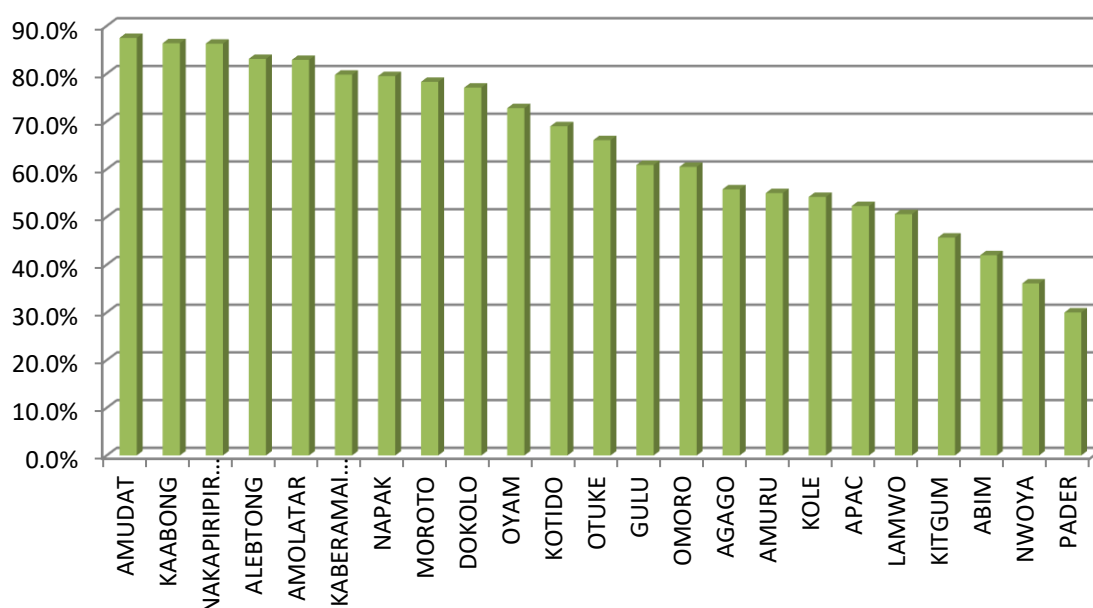


Figure 5: Proportion of respondents who had heard or seen a message about malaria in the past six months

Overall, 64 percent of the survey respondents reported that they had heard or seen a message about malaria in the six months preceding the study. The highest levels of exposure to malaria messages was reported in the three Karamoja districts of Amudat (87.5 percent), Kaabong (86.4 percent) and Nakapiripirit (86.3 percent). The lowest was in Pader (30 percent), Nwoya (36.1 percent) and Abim (42 percent).

4.7 Information sources about malaria

4.7.1 Information sources for caregivers, family decision makers and pregnant women

Table 12 shows the reported sources of information on malaria across the 23 districts.

Table 12: Caregivers' sources of messages on malaria in the past six months

District	A	B	C	D	E	F	G	H	Other	Number
ABIM	61.9%	90.5%	23.8%	14.3%	0.0%	14.3%	0.0%	9.5%	14.3%	21
AGAGO	68.7%	46.3%	34.3%	6.0%	6.0%	7.5%	0.0%	6.0%	10.5%	67
ALEBTONG	81.6%	36.9%	37.9%	14.6%	17.5%	5.8%	5.8%	6.8%	10.7%	103
AMOLATAR	84.1%	34.9%	46.0%	19.0%	12.7%	0.0%	11.1%	3.2%	11.1%	63
AMUDAT	71.4%	81.0%	23.8%	28.6%	4.8%	23.8%	21.4%	7.1%	0.0%	42
AMURU	76.4%	63.6%	41.8%	9.1%	12.7%	5.5%	9.1%	5.5%	18.1%	55
APAC	71.8%	60.2%	44.7%	6.8%	9.7%	2.9%	6.8%	3.9%	7.7%	103

DOKOLO	64.9%	39.2%	51.4%	14.9%	2.7%	1.4%	4.1%	2.7%	6.9%	74
GULU	60.9%	51.1%	56.5%	10.9%	10.9%	3.3%	2.2%	1.1%	40.2%	92
KAABONG	67.1%	78.6%	37.1%	24.3%	35.7%	12.9%	17.1%	17.1%	17.2%	70
KABERAMAID O	78.3%	32.5%	55.4%	10.8%	16.9%	0.0%	7.2%	1.2%	6.0%	83
KITGUM	69.8%	79.2%	18.9%	41.5%	15.1%	34.0%	5.7%	39.6%	11.3%	53
KOLE	69.0%	52.1%	49.3%	11.3%	7.0%	1.4%	4.2%	1.4%	12.6%	71
KOTIDO	79.6%	59.2%	38.8%	28.6%	36.7%	2.0%	10.2%	14.3%	16.2%	49
LAMWO	60.0%	70.0%	32.5%	12.5%	10.0%	5.0%	7.5%	5.0%	0.0%	40
MOROTO	87.2%	72.3%	66.0%	59.6%	27.7%	40.4%	34.0%	6.4%	17.0%	47
NAKAPIRIPIT	79.4%	95.2%	11.1%	15.9%	25.4%	41.3%	20.6%	3.2%	6.4%	63
NAPAK	89.7%	74.1%	43.1%	32.8%	32.8%	6.9%	3.4%	3.4%	17.1%	58
NWOYA	76.9%	42.3%	53.8%	7.7%	15.4%	0.0%	3.8%	0.0%	19.1%	26
OMORO	59.6%	63.5%	55.8%	7.7%	3.8%	1.9%	3.8%	0.0%	13.4%	52
OTUKE	71.8%	64.1%	51.3%	7.7%	5.1%	2.6%	0.0%	2.6%	25.6%	39
OYAM	69.7%	65.2%	45.2%	8.4%	3.2%	0.6%	3.9%	3.2%	2.4%	155
PADER	81.5%	66.7%	33.3%	14.8%	3.7%	7.4%	0.0%	3.7%	3.7%	27
Total	72.5	59.2	42.6	16.3	13.6	8.2	7.6	5.9	12.2%	
Number	1,059	860	619	237	197	119	111	86	177	1,453

Key to column headings

A – Health workers

B – VHTs

C – Radio

D – Community meeting / event

E – Family member / neighbour / friend

F – Local leader / LC official

G – Religious / social gathering

H – Local government / NGO extension staff

I – Other

The data shows that health workers from health facilities were the most reported source of information on malaria control, with people having heard or seen messages on malaria control in the preceding six months. Health workers were mentioned by 72.5 percent of the respondents, followed by VHTs (59.2 percent), and radio (42.6 percent). These three were the dominant sources. Health workers as a source of information on malaria control were most reported in Amolator, Alebtong, Kaberamaido, Kotido, Moroto, Nakapiripirit, Napak, and Pader. On the other hand, VHTs were

mentioned most as a source of messages on malaria control in the Karamoja districts of Abim, Amudat, Kaabong, Nakapiripirit, and Napak, as well as the Acholi district of Kitgum. The districts where exposure to malaria messages was greatest (in Amudat, Kaabong and Nakapiripirit) all had the highest percentages of respondents reporting their source of information as VHTs. This can be attributed to the iCCM programme, which has trained and is supporting VHTs in these Karamoja districts, to disseminate information on malaria and undertake other malaria control interventions.

Local leaders as a source of messages on malaria control were reported by only 8.2 percent of the respondents, indicating a low key role currently played by local leaders such as LC officials. Religious leaders were also mentioned by only 7.6 percent. Local leaders were most mentioned in Kitgum, Moroto, and Nakapiripirit, while religious were most mentioned in Moroto, Nakapiripirit, Kotido, Kaabong, Amudat and Amolator. Gulu district has a large proportion of respondents who reported “other sources” – including TV and newspapers. This is explained by the fact that one of the sample sub-counties studied in Gulu District was urban, i.e. part of the municipality where access to TV and newspapers is high.

4.7.2 Information sources for VHTs

The main source of information on malaria for VHTs was reported to be the trainings that they receive on iCCM or other malaria-related interventions. Some, such as those from Gulu, Amuru and Omoro districts had received training in iCCM from PACE as recently as 2017. As a result, VHTs who had not received any training in a long time were not up-to-date with new developments in malaria control. Other VHTs reported their sources of information to include health facility workers and radio.

4.7.3 Information sources for DHMTs and facility health workers

Health facility workers reported their major source of information to be trainings conducted by the MoH and other partners. These include for instance trainings in iCCM, on new artesunate, etc. Such trainings have been implemented by the MoH and other partners such as PACE and Unicef. Health workers and DHMT members noted that a lot of things have happened regarding management of malaria and therefore more training was needed for the health workers.

4.8 Barriers and facilitators of behaviour change

4.8.1 Barriers and facilitators of behaviour change among caregivers, family decision-makers and pregnant women

Caregivers of children under five and pregnant women who participated in the survey were asked about the barriers they face in using malaria prevention tools such as nets and IRS. Table 13 shows the results.

Table 13: Reported possible barriers to use of malaria preventive measures

District	Lack of money	Lack of malaria control tools	Negligence	Fear of IRS side effects	Don't believe they are useful	Fear of side effects of nets	Fear of IPTp side effects	Other	Don't know	Number
ABIM	44%	16%	6%	2%	2%	12%	0%	9%	20%	50
AGAGO	32%	35%	2%	2%	1%	0%	1%	19%	18%	120
ALEBTONG	72%	48%	11%	16%	6%	2%	3%	10%	4%	124
AMOLATAR	74%	72%	29%	13%	5%	4%	4%	3%	1%	76
AMUDAT	79%	71%	6%	4%	12%	15%	15%	0%	0%	48
AMURU	16%	19%	7%	1%	1%	1%	0%	55%	2%	100
APAC	36%	40%	11%	6%	4%	3%	1%	7%	23%	197
DOKOLO	18%	43%	9%	7%	0%	1%	0%	10%	19%	96
GULU	40%	15%	5%	5%	1%	3%	1%	32%	11%	151
KAABONG	42%	36%	43%	0%	2%	4%	0%	14%	6%	81
KABERA-MAIDO	74%	63%	21%	30%	12%	2%	4%	11%	0%	104
KITGUM	58%	56%	16%	4%	3%	5%	3%	17%	1%	116
KOLE	24%	66%	16%	2%	0%	0%	0%	5%	14%	131
KOTIDO	37%	42%	39%	1%	0%	1%	0%	11%	7%	71
LAMWO	30%	37%	10%	10%	4%	1%	3%	27%	14%	79
MOROTO	77%	72%	19%	7%	0%	12%	2%	0%	0%	57
NAKAPIR-IPIRIT	81%	53%	16%	5%	19%	5%	22%	1%	0%	73
NAPAK	91%	54%	17%	7%	0%	0%	0%	3%	0%	69

NWOYA	29%	54%	18%	4%	6%	0%	0%	6%	19%	72
OMORO	20%	21%	8%	2%	1%	3%	0%	66%	1%	86
OTUKE	20%	42%	0%	0%	0%	2%	0%	42%	0%	59
OYAM	35%	42%	5%	5%	1%	1%	1%	14%	19%	213
PADER	53%	54%	14%	2%	1%	0%	0%	6%	1%	90
Total	44.4%	44.4%	13.3%	6.2%	3.2%	2.7%	2.0%	16.4%	9.5%	
Number	1,005	1,004	300	140	73	61	46	353	215	2,263

The results in Table 13 show that the most reported barriers include lack of money (44.4 percent), lack of malaria control tools (44.4 percent), negligence (13.3 percent) and fear of side effects from IRS (6.2 percent). Lack of money was most reported in the districts of Napak, Nakapiripirit, Moroto, Amudat, Alebtong and Kaberamaido. Lack of malaria control tools was most reported in Moroto, Amudat and Amolator. Fear of IRS side effects was most reported in Kaberamaido, Alebtong and Amolator. Overall, 33 percent of the respondents mentioned two or more barriers (*not shown in table*).

Some of the barriers to behaviour change, and specifically to the use of nets and prevention of mosquito bites were reported to be cultural.

...let me start with the issue of culture. Here in the Northern, we have that culture where people tend to stay out at the fireplace. In the evening, they make up the fire, and sit outside. There, the mosquitoes bite them and by the time you go in the mosquito net, the mosquitos have already given you the dose (MFP, Pader District).

4.8.2 Malaria risk perception among caregivers and pregnant women

The majority (79 percent) of the respondents believed they were at risk of getting malaria, compared to 19.6 percent who said they were not at risk and 1.4 percent that did not know. See Figure 6.

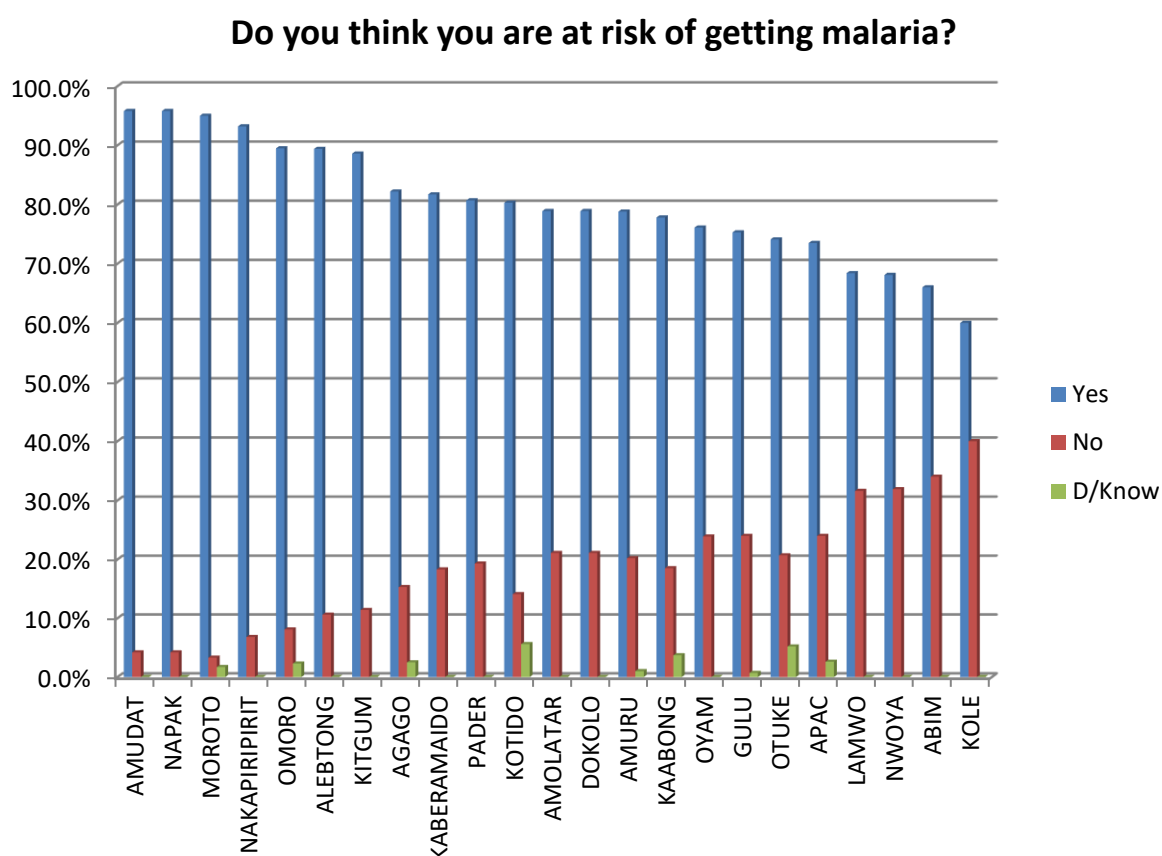


Figure 6: Proportion of survey respondents who perceived themselves to be at risk of getting malaria

We further asked survey respondents to rate their perceived level of risk to malaria infection. The results are shown in Table 14.

Table 14: Perceived degree of risk to malaria infection

District	Perceived degree of risk			Number of respondents
	Very high risk	Moderate risk	Low risk	
ABIM	42.4%	48.5%	9.1%	33
AGAGO	40.2%	46.7%	13.0%	92
ALEBTONG	43.4%	44.3%	12.3%	106
AMOLATAR	43.3%	33.3%	23.3%	60
AMUDAT	15.2%	52.2%	32.6%	46
AMURU	21.3%	48.0%	30.7%	75
APAC	55.9%	31.5%	12.6%	143

DOKOLO	38.4%	31.5%	30.1%	73
GULU	41.8%	43.6%	14.5%	110
KAABONG	37.7%	47.5%	14.8%	61
KABERAMAIDO	40.5%	36.9%	22.6%	84
KITGUM	82.6%	16.3%	1.1%	92
KOLE	29.9%	50.6%	19.5%	77
KOTIDO	52.7%	38.2%	9.1%	55
LAMWO	63.5%	25.0%	11.5%	52
MOROTO	54.7%	20.8%	24.5%	53
NAKAPIRIPIT	29.0%	45.2%	25.8%	62
NAPAK	59.0%	24.6%	16.4%	61
NWOYA	47.9%	37.5%	14.6%	48
OMORO	31.6%	51.3%	17.1%	76
OTUKE	21.4%	52.4%	26.2%	42
OYAM	29.0%	42.0%	29.0%	162
PADER	61.4%	25.7%	12.9%	70
Total	43.1%	38.6%	18.3%	
Number	747	669	317	1,733

Overall, 43.1 percent of the respondents rated their risk of catching malaria as very high, 38.6 percent as moderate, and 18.3 percent as low. The districts with the highest proportions of respondents rating their risk to malaria as very high include Kitgum (82.6 percent), Pader (61.4 percent), Lamwo (63.5 percent), Napak (59 percent) and Apac (55.9 percent).

Those who reported to be at high risk gave different reasons for their risk perception. The most common reason for rating themselves as being at high risk was the presence of lots of mosquitoes (57.4 percent), followed by the belief/fear that they would get malaria from other people (21.6 percent), use of an old/torn net (12.3 percent) and non-use of a net (10 percent). The districts concerned about the number of mosquitoes included Kitgum, Napak, Nwoya and Pader. The districts where non-use of nets was a major reason for the high risk perception included Nwoya, Otukey and Nakapiripit.

4.8.3 Perceptions about the dangers of malaria and efficacy of malaria prevention methods

During the KAPB survey, a number of statements regarding the dangers of malaria and the efficacy of different malaria management methods were read to the survey participants, and they were asked to agree or disagree with the statements. Table 15 shows the perceptions of caregivers and pregnant women about the dangers of malaria and the efficacy of various malaria prevention methods.

Table 15: Respondents' perceptions about the dangers of malaria and effectiveness of malaria prevention methods

Statement	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Malaria is a serious and life-threatening disease	75.6%	23.5%	0.4%	0.5%	0
Anyone can get malaria	62.6%	35.7%	0.8%	0.8%	0.1%
The best way to prevent oneself from getting malaria is to avoid being bitten by mosquitoes	51.0%	43.4%	2.3%	2.9%	0.4%
Sleeping under a mosquito net every night is one sure way to prevent malaria	43.2%	39.4%	7.8%	8%	1.6%
IRS is an effective practice to reduce malaria	31.6%	38.7%	13.9%	9.7%	6.1%
IPTp is effective in preventing malaria amongst pregnant women	44.9%	36.9%	9.9%	5.9%	2.4%
It is necessary to have a malaria diagnostic test before treatment is taken	54.4%	38.1%	3.6%	2.4%	1.5%
It is risky not to complete a dose of anti-malarial drugs completely	48.0%	42.3%	4.2%	3.3%	2.2%

The results in Table 15 show that almost all respondents (a total of 99.1 percent) agree that malaria is a serious and life-threatening disease. Similarly, 98 percent agree that anyone can get malaria, meaning that everyone is at risk. In addition, 94.4 percent agree that the best way to avoid malaria is to avoid mosquito bites. However, only 82.6 percent agreed that sleeping under a net is the best way to avoid malaria and 70 percent agreed that IRS is effective against malaria. In the case of IRS, this could be understandable since some of the districts including those in the Karamoja region have not had IRS. Indeed, cross-tabulation by district shows that perception of IRS as effective control against malaria was lowest in the Karamoja sub-region districts. The majority (92.5 percent) of respondents believed that it is important to take a test before treatment for malaria is taken; 90.3 percent agreed that it is risky not to complete a treatment of anti-malarials.

Overall, these results show positive attitudes and perceptions that can serve as enablers to the adoption of malaria control behaviours and interventions.

4.8.4 Respondents' self-efficacy for malaria control

Survey respondents were also tested for self-efficacy for malaria control. Two statements were read to them and they were asked if they agreed or disagreed with these statements. Table 16 shows the results.

Table 16: Respondents' levels of self-efficacy for malaria prevention and treatment

Statement	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I am confident that I can prevent myself from getting malaria	23.7%	47.1%	9.0%	16.4%	3.9%
I am confident that if I suspect that I have malaria, I can seek appropriate treatment	43.3%	46.3%	6.0%	4.2%	0.2%

The results show that 70.8 percent believed that they could prevent themselves from getting malaria. This leaves almost one third who lack the self-efficacy for malaria prevention. On the other hand, 89.8 percent believed they could seek appropriate treatment for malaria if they suspected to be infected were higher at The SURMa programme will need to strengthen people's beliefs and abilities for the control of malaria.

4.9 Status of BCC structures/systems in the districts

A district malaria response cannot be complete without an effective information, education and communication, and behavioural change communication system. Districts need a vibrant system and structure in place to implement an effective IEC/BCC programme.

During this study, it was established that all districts have District Information Officers (DIOs) who are responsible for information collection, processing and dissemination to the public. They are also supposed to speak on behalf of the district. Each district also has a District Health Educator (DHE) who leads health education activities including designing messages and translating them in local languages in a way that people can understand. The DIO is supposed to work hand in hand with the DHE to ensure messages are delivered to the target audiences. The formal district channel of information dissemination also includes health inspectors and health assistants at sub-county level, down to the VHTs. Some of the information is also transmitted through the health workers.

Most districts reported that they have been running integrated radio programmes sponsored under the office of the Resident District Commissioners (RDC), who has free radio airtime. District Health Officials from time to time arrange or are invited to appear on radio talk shows alongside the RDC and other district leaders to talk about matters of health including malaria.

On the other hand, most districts reported that they did not have up-to-date IEC materials. The few materials that are received are also usually in English. They also lack facilities such as film vans, loud speakers, and other equipment for public address purposes. A few districts such as Agago reported that they have mega phones.

Some districts have also been providing information through political leaders, religious leaders (churches) and local leaders.

4.10 Influential agents and channels through whom new information can be disseminated

Most study participants when asked about the influential agents and channels through whom information on malaria can be disseminated mentioned district political leaders such as the District Council Chairperson and the RDC. They also mentioned religious leaders who can disseminate information through their places of worship. Both political and religious leaders also have the platform to pass on information on malaria control during community events such as weddings and funerals. In the Karamoja region, it was reported that elders play an influential role in society, and therefore can be very influential agents in the dissemination of malaria information and in behaviour change.

“Here is still a very traditional community and the elders here are respected more, so through using the elders’ forum and then the church we shall probably reach a great number of people” (KII, In-charge Kotido HC IV, Kotido District).

Other categories of influential agents widely mentioned include VHTs and health workers.

In addition, individual community members were found to have a great influence on their acquaintances such as family members and friends. Figure 8 shows the proportion of survey respondents who reported that they had encouraged someone else to adopt malaria prevention, health-seeking or treatment in the preceding three months.

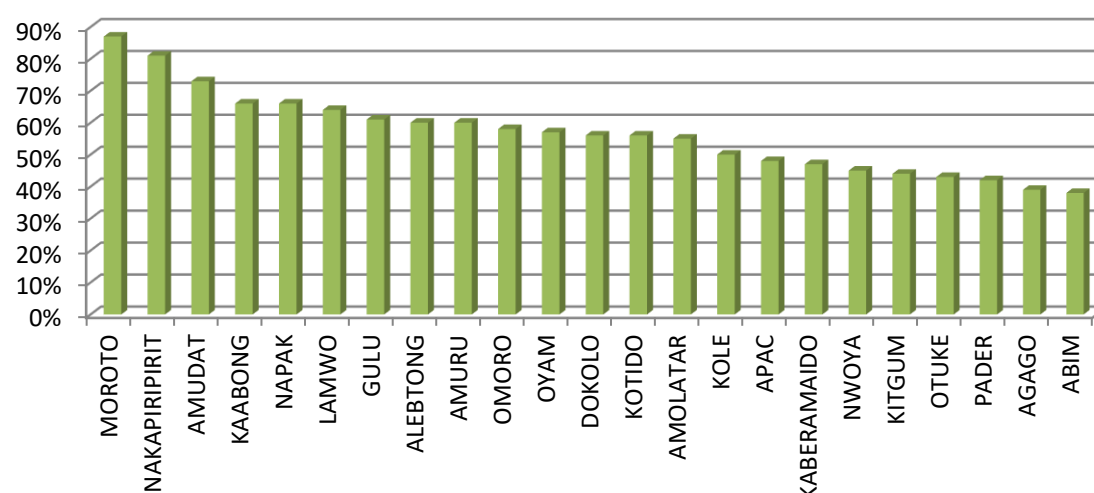


Figure 7: Proportion of Respondents who encouraged another person to adopt malaria prevention, health-seeking or treatment in the past three months

Interpersonal influence among survey respondents was most reported in the districts of Moroto, Nakapiripit, and Amudat.

Overall, 74 percent of the survey respondents could propose two or more ways of educating other people about malaria and promoting behaviour change.

4.11 General challenges in district malaria response

Across all districts, a major challenge reported was that most activities such as training of health workers, IEC/BCC activities, and implementing community-based treatment of malaria are vertically organised and project/donor-dependent, to the extent that nothing happens in absence of project/donor funding. This also affected the sustainability of malaria control interventions.

Irregular support supervision was also raised as a key challenge. Whereas support supervision is supposed to be quarterly, it is not regularly done due to inadequate funding.

5 Conclusions, Lessons and Recommendations

5.1 Conclusions

The findings reveal that whereas a majority of the survey participants know that malaria is transmitted through mosquito bites, many respondents also believed that malaria is also transmitted through other insects such as flies, cockroaches and bedbugs. Such beliefs are widespread in the Karamoja districts. Equally so, there are widespread beliefs in some districts that malaria is airborne and also transmitted through physical contact with an infected person. The least accurate knowledge of malaria prevention methods is in the Lango region. The symptoms of malaria are widely known, except in some districts such as Lamwo and Kitgum. The ability of caregivers to distinguish between uncomplicated and severe malaria is still inadequate.

Pregnant mothers know that sleeping under a mosquito net and taking Fansidar during pregnancy are effective means of prevention against malaria during pregnancy, though some are not sure about the number of times they have to take IPTp. VHTs, caregivers and health workers are all comfortable with the use of rectally administered treatments such as rectal artesunate.

Use of mRDTs to confirm the presence of malaria in one's body is already widely known and supported. However, some VHTs and health workers expressed concerns about instances where mRDTs give false results or those that contradict microscopy results.

Caregivers of children appreciate the role played by VHTs and prefer their services mainly due to their accessibility. The challenges of stock-outs of Coartem, RDT kits and other supplies such as gloves remain important. While it was reported that most caregivers comply with the referral advice of the VHTs, it was also noted that others hesitate to be referred because of several reasons including transport costs, long distances to health facilities and the perceived poor quality of care at the referral facilities.

Caregivers and family decision makers express largely positive attitudes towards seeking care from health facilities. Some, however, express reluctance to seek care from health facilities due to the perceived poor quality of services sometimes witnessed in public health facilities, reflected through stock-outs of drugs and poor attitudes of health workers. Early care-seeking for children suspected of malaria is still a challenge with less than two-thirds (61.7 percent) of the caregivers whose children under five had malaria-like symptoms in the past three months reported that they sought treatment within 24 hours.

Four categories of influential agents were identified; they are resourceful and hold positive attitudes towards malaria control interventions and should therefore be used as partners in malaria control. They are: cultural leaders/elders, District political leaders (RDC, Chairperson LCV), religious leaders and VHTs/ health workers.

Net use is high, but net care and repair appears to still be lagging. More than one third of nets observed had holes, and less than a half of them had evidence of repair efforts. Barriers to net use include inadequate nets in households, feeling hot inside nets, itching, as well as social-cultural barriers such as the size and nature of houses and sleeping arrangements, whereby some people sleep on mats placed on floors. Misuse of nets was reported in some communities, as well as re-use of old nets. While some household heads and caregivers express willingness to replace old nets, others expect the government to give them new nets when the current ones get old.

The key drivers of caregiver behaviour in malaria control were found to include caregiver knowledge, distance to the health facility, perceptions and previous experience about the availability of drugs at health facilities, perceptions about the severity of illness, and social cultural and gender factors. The key drivers of behaviour among VHTs include training, availability of antimalarials and other necessary supplies, facilitation, level of motivation, and the level of contact/linkage with health facilities and partner agencies.

Other actors such as schools, police, prisons, agriculturalists and road contractors acknowledge how their activities contribute to the spread of malaria, and how their members are at risk of malaria.

They also acknowledge the need to collaborate in an effort to control malaria. There is therefore a huge potential for Malaria Consortium to collaborate with these actors.

5.2 Recommendations to be considered during SURMa project implementation

The baseline KAPB study findings inform the SURMa project to consider the following recommendations:

	Findings / Issues	Recommendations
	Big proportions of caregivers of children under five and pregnant women believe malaria is transmitted through mosquitoes, but also through other insects, through the air and through contact with an infected person.	The SURMa project will include in its IEC/BCC campaign information about the transmission of malaria. The campaign should aim to dispel misinformation that malaria is transmitted by other insects, through the air or contact with an infected person.
	The majority of the caregivers and pregnant women (78%) could mention net use and 36.2% could specifically mention use of LLINs as best ways of preventing malaria. 75.9% could mention two or more correct ways of preventing malaria. However, 13.6% of these respondents think malaria can be prevented through other ways such as washing hands, avoiding coldness, maintaining personal hygiene and cleanliness, drinking safe water or not eating raw mangoes.	The IEC/BCC campaign will include information on the correct ways of preventing malaria. People should be encouraged to protect themselves from mosquito bites (through LLIN use, IRS, and clearing of mosquito breeding sites) as the best way to prevent malaria.
	While caregivers of children under five could enumerate several of the symptoms of malaria, some could not clearly distinguish between the signs and symptoms of uncomplicated malaria and those of severe malaria.	The SURMa project's IEC/BCC activities will educate people about the danger signs of malaria and how it can be distinguished from uncomplicated malaria in order to promote appropriate and prompt care-seeking.
	While pregnant mothers and mother with children under three months knew about IPTp, there were inconsistencies in knowledge about how many times a pregnant mother should take IPTp.	The SURMa project's IEC/BCC campaign will include messages about the recommended number of times that a pregnant mother should take IPTp.
	In many communities, it was reported that the VHTs had not been trained in a long time, while in others, new ones were selected.	The SURMa project will train VHTs or any other type of CHWs it intends to work with in the specific aspects of iCCM and other malaria control approaches that will be used.

	There is widespread concern among VHTs and health workers that RDTs sometimes give false results, or give results that are contradicted by a microscopy test.	Training of VHTs/health workers in RDT use will emphasise circumstances under which RDTs may post false results.
	VHTs are under-facilitated and not adequately supported and supervised.	The project will equip VHTs and CHWs with necessary tools and equipment after training, to enable them to perform their roles. VHTs will also be remunerated adequately considering the amount of time they will need to put into project activities. Other ways of motivating VHTs should be explored.
	Use of nets is partly influenced by the nature of housing structures and sleeping arrangements. Most houses and bedrooms in Northern Uganda and Karamoja sub-regions are low and small; and some people sleep on mats placed on the floor.	More qualitative and quantitative research is needed to determine the sleeping arrangements, e.g. what is the extent of people sleeping on the floor and how this affects net use?
		The SURMa project will work with other partners to explore the appropriateness of existing LLINs when people sleep on mats placed on the floor. In cases where the existing nets are not suited for this sleeping arrangement, it is important to collaborate with net manufacturers to make appropriate nets that suit these contexts.
	Results on care for nets show that more than one third of the nets observed in households were not tucked away during the day to protect them from accidental tearing. In addition, the majority of the nets that were torn had not been repaired.	The SURMa project will include activities to train households in caring for nets to make them last longer. This will include training about hanging nets, tucking them away during the day, washing of nets and repairing torn nets.
	In some communities, caregivers reported that they stop giving medicine when the child with malaria gets better without completing the dose. They do this in order to preserve medicine for future use in case the child or another child gets malaria in the near future.	The projects IEC/BCC campaign as well as the information passed on by health workers and VHTs will emphasise the need to complete the prescribed dose of anti-malarial, and the dangers of not completing the dose.
	Where some caregivers and household heads perceive it as their responsibility to replace worn out nets, others say they are poor and will not be able to replace old nets. The latter argue that the government should help them with new	The project will, through its IEC/BCC interventions, seek to change attitudes of dependency on government, and inculcate a sense of willingness to replace old nets. This will entail demonstrating the benefits of replacing nets versus the costs of suffering malaria.

	nets in the future if their current nets get old.	
	In a number of districts in the Lango and Acholi sub-regions such as Dokolo and Otuke, there is no iCCM programme and VHTs do not have RDTs to diagnose and drugs to treat malaria.	The SURMa project will scale up iCCM in the districts that do not have this programme.
	Some of the health workers in various levels of health facilities have not received training on the updated treatment protocols for malaria.	The SURMa project will provide training to health facility workers on recent developments in malaria management, including treatment guidelines and protocols.
	Mass distribution of nets has not adequately covered settings such as camps for road construction workers and boarding schools.	The SURMa project will, in collaboration with the MoH, undertake focused distribution of nets in road construction camps, prisons, boarding schools and other similar settings in order to promote malaria prevention.
	Some caregivers delay to seek care for children suspected of malaria; others are reluctant to seek care and complete referrals at health facilities due to issues of distance, perceived poor quality of care, etc.	The SURMa project in collaboration with districts should engage communities and other stakeholders in malaria control to find appropriate means of enabling communities to seek early care for suspected cases of malaria and to complete referrals.
	Actors in other sectors such as road construction and agriculture acknowledge that they contribute to the spread of malaria by creating breeding grounds for mosquitoes. All other actors and institutions also agree that malaria control requires a multi-sectoral effort.	<p>The SURMa project will initiate collaborations with actors in other sectors such as road construction, building construction, agriculture, brick making, schools, police and prisons to undertake joint interventions aimed at malaria prevention and control in these sectors. Such interventions will be tailored to the needs and potential resources available within these sectors. They may for instance include:</p> <ul style="list-style-type: none"> • School malaria clubs in schools • Interventions to prevent exposure to mosquito bites during night duty among armed forces • Refill of soil excavation pits among construction and brick-making workers, etc.
	District budgets and plans, as well as bills of quantities for contractors include provisions for HIV prevention/mitigation but none for malaria prevention and control.	The BOQs for district buildings, roads and other construction works should clearly indicate and include malaria preventive issues as is the case with HIV/AIDS. Sensitisation in the affected communities on the minimum malaria preventive package, the consequences of malaria and mandatory usage of nets by all workers on the construction sites amongst others should be clearly spelled out in the BOQs.

	Some districts such as Kaabong reported that while mass net distribution was completed, malaria cases seem not to have reduced. This could imply poor or inconsistent use of nets, staying out long into the night, or other behaviour that is not consistent with effective net use.	The project will provide both information as well as support to enable all household members to use nets. These will include net-hanging demonstrations and support, net use monitoring, and encouragement to repair torn nets.
	Key informants from institutions such as schools, police and prisons reported that residential premises for their members rarely have wire mesh in the windows and ventilators.	The SURMa project will undertake both collaborative and advocacy activities with Districts and other responsible agencies to ensure that residential premises in institutions such as schools, police and prisons are fitted with wire mesh to prevent entry of mosquitoes.

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Annex T1: Percentage of survey respondents that know the common signs and symptoms of malaria

District	High temperature / fever	Nausea / vomiting	Head-ache	Pale eyes	Feeling cold	Diarrhoea	Loss of appetite / failure to eat / drink	Loss of energy / general weakness	Body and joint pains	Dizziness	Other	Don't know	Number
ABIM	81.6%	38.8%	10.2%	32.7%	22.4%	16.3%	24.5%	24.5%	6.1%	12.2%	10.4%	2.0%	
AGAGO	68.9%	58.0%	22.7%	44.5%	24.4%	23.5%	17.6%	15.1%	10.9%	12.6%	10.0%	1.7%	
ALEBTONG	83.1%	62.9%	30.6%	35.5%	33.1%	18.5%	31.5%	26.6%	11.3%	4.0%	16.0%	.0%	
AMOLATAR	78.9%	50.0%	27.6%	34.2%	30.3%	21.1%	26.3%	26.3%	18.4%	6.6%	30.9%	.0%	
AMUDAT	100.0%	87.5%	75.0%	18.8%	33.3%	33.3%	27.1%	33.3%	70.8%	16.7%	4.2%	.0%	
AMURU	85.0%	63.0%	57.0%	41.0%	64.0%	13.0%	23.0%	14.0%	23.0%	10.0%	21.1%	3.0%	
APAC	78.2%	61.9%	22.8%	51.3%	28.9%	27.4%	16.2%	16.8%	6.1%	14.7%	8.9%	.5%	
DOKOLO	70.8%	57.3%	31.2%	44.8%	29.2%	24.0%	17.7%	6.2%	12.5%	12.5%	6.4%	.0%	
GULU	87.8%	62.8%	52.7%	40.5%	44.6%	25.0%	22.3%	27.0%	23.6%	14.2%	9.8%	.0%	
KAABONG	82.7%	71.6%	40.7%	24.7%	19.8%	37.0%	29.6%	27.2%	23.5%	8.6%	33.8%	1.2%	
KABERAMAIDO	88.5%	64.4%	32.7%	25.0%	22.1%	14.4%	26.9%	25.0%	10.6%	4.8%	17.3%	.0%	
KITGUM	67.2%	75.0%	47.8%	43.1%	40.4%	29.8%	26.3%	22.8%	33.6%	13.9%	7.3%	.0%	
KOLE	84.7%	49.6%	27.5%	45.0%	32.8%	27.5%	20.6%	22.9%	11.5%	6.9%	15.0%	.8%	
KOTIDO	85.9%	73.2%	52.1%	21.1%	18.3%	60.6%	33.8%	19.7%	29.6%	5.6%	28.1%	1.4%	

LAMWO	57.0%	49.4%	43.0%	43.0%	41.8%	31.6%	15.2%	25.3%	15.2%	12.7%	8.7%	.0%	
MOROTO	98.2%	89.1%	45.5%	38.2%	41.8%	74.5%	63.6%	32.7%	14.5%	20.0%	.0%	1.8%	
NAKAPIRIPIRIT	100.0%	84.9%	50.7%	11.0%	21.9%	39.7%	45.2%	49.3%	63.0%	4.1%	2.7%	.0%	
NAPAK	94.0%	79.1%	38.8%	6.0%	32.8%	70.1%	49.3%	29.9%	13.4%	23.9%	.0%	.0%	
NWOYA	84.7%	55.6%	41.7%	27.8%	45.8%	18.1%	9.7%	12.5%	9.7%	20.8%	7.0%	.0%	
OMORO	85.5%	67.5%	60.2%	31.3%	63.9%	21.7%	8.4%	7.2%	25.3%	10.8%	16.7%	.0%	
OTUKE	81.4%	55.9%	15.3%	42.4%	33.9%	11.9%	18.6%	6.8%	5.1%	11.9%	17.3%	.0%	
OYAM	81.2%	64.3%	27.2%	41.3%	36.6%	25.8%	12.7%	17.4%	18.3%	10.3%	7.7%	.0%	
PADER	73.3%	55.6%	41.1%	45.6%	45.6%	28.9%	10.0%	13.3%	10.0%	7.8%	14.1%	.0%	
	1833	1427	838	830	795	637	517	472	419	252	250	11	
	81.4%	63.4%	37.2%	36.9%	35.3%	28.3%	23.0%	21.0%	18.6%	11.2%	12.1%	.5%	

Appendix 1: Sample size determination

The survey was conducted in 23 districts in Mid-North and Karamoja sub-regions which make up the project area with an estimated population of about 4.7 million people (UBOS population projections, 2017).

Only one person was interviewed in each sampled household, and therefore we sampled from households not individuals. Given the focus of the project, which is on malaria, we were interested in households with a pregnant woman or a child under the age of five, who are usually the main targets of malaria interventions.

To derive a representative sample size, we took into account the following considerations /assumptions:

- An average rural household in Uganda has five people and so there are 940,000 households in the study area 75% of households have a pregnant woman or a child under five

Therefore, we chose from about 705,000 households.

Having estimated the number of households with either a pregnant woman or a child under five to be 705,000, the Yamane (1967) formula was used to determine a representative sample size for this study:

$$n = \frac{N}{(1 + Ne^2)}$$

Where,

n – Is the desired sample size

N – Overall estimated total population of subjects/units under consideration, and

ε – is the margin of error ($\varepsilon = 0.03$)

$$n = \frac{705,000}{(1 + 705,000 (0.03)^2)}$$

Hence n = 1,109

The sample of 1,109 households was boosted by 100% to ensure that each district would have an adequate sample size to allow individual district analysis and interpretation of data. Thus a boosted sample size of **2,218** was computed but this was slightly exceeded during fieldwork to a total of 2,270.

The sample was distributed across the 23 districts using a 'probability proportional to size' approach, with the estimated total number of households in each district that have either a pregnant woman or child under five.