



# Pioneer Project

A HOLISTIC SYSTEMS STRENGTHENING APPROACH  
TOWARDS MALARIA CONTROL IN MID-WESTERN UGANDA






Successes and lessons





## Malaria in Uganda

Malaria is one of the leading causes of death and disease worldwide, especially in the developing world.

-  **100%**  
of Uganda's population is at risk of malaria  
(World Malaria Report, World Health Organization, 2013)
-  **15,632**  
deaths occur annually from malaria  
(World Malaria Report, World Health Organization, 2013)
-  **13%**  
of deaths of children under five are due to malaria  
(World Health Organization, 2012)
-  **48%**  
of outpatients deaths in 2009/2010 were due to malaria  
(Ministry of Health statistical abstract, 2010)
-  **1/4**  
of family income is lost annually to treatment of malaria  
(Uganda Demographic Health Service, 2011)

The Pioneer Project worked to ensure malaria control interventions reached the most basic unit: the household

Left, Sarah and her husband Byron, with Baby Goodluck are one of the 1.6 million Ugandans benefitting from the Pioneer Project

# Pioneer Project

Over the five years of the Pioneer Project, Malaria Consortium has developed approaches, piloted interventions, improved processes and integrated learning for continuous programme development. This document details what we did, how we did it – including the lessons that emerged – and what impact it had. The objective is to share Malaria Consortium’s experience implementing a holistic system strengthening approach and to ensure that findings and lessons drawn from the project are made available to those involved in the implementation and scale up of malaria control interventions.

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*“We all sleep under a net. My last born is two years old and she has never suffered from malaria. When the older ones get sick I take them to the VHT and sometimes the health centre and they are better in a few days. Treating the whole family was costly. Now, we no longer frequent hospitals due to malaria.”*

Mildred Tumusiime, mother of five children and beneficiary of the Pioneer Project




# malaria consortium

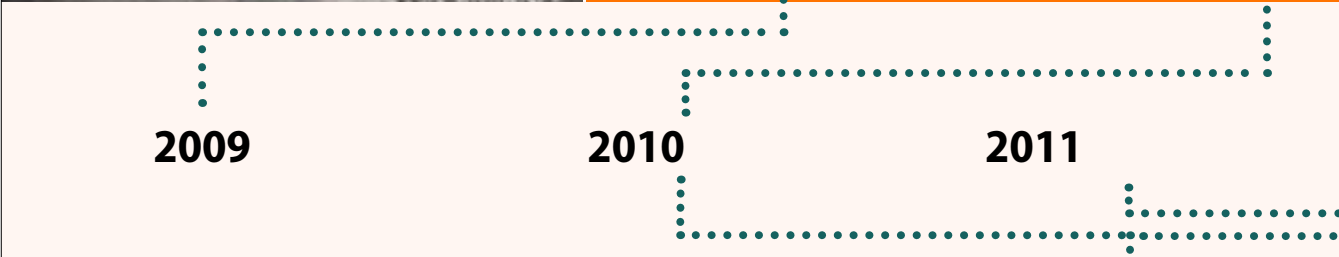
disease control, better health



**prevention** 605,266



**Distribution:**  
Long lasting insecticide treated nets (LLINs) distributed in 5 districts: Hoima, Buliisa, Kiboga, Kibaale, Kyankwanzi 2009-2010




**case management** 1,113

Health workers trained in 88 centres in the use of RDT and chain management  
Reduction in anti-malarials stock  
National training curricula developed  
Dissemination of lessons learned 2010



**behaviour change community**



KAPB study  
Radio spots and radio talk shows  
Distribution of IEC materials  
Community dialogues  
School music, dance, drama, talking corners 2010-2014

# Pioneer Project

Malaria related morbidity and mortality  
**Reaching 1.6 million Ugandans**

## Mosquito density reduction

Entomological surveillance:  
 Training of vector control officers  
 Training of mosquito collectors  
 Supervised reduction of mosquito  
 density and malaria transmission  
 2009-2012

## Increase in LLIN ownership

Monitoring and evaluation:  
 Net retention survey, Household survey  
 2010  
 Learning question: "The long term  
 determinants of use and non-use of LLIN"  
 2012

## Advocating for sustainable coverage of LLINs in Uganda

Dissemination:  
 LLIN roundtable (UK)  
 Advocacy brief  
 2013-2014

2012

2013

2014

## Health system strengthening

Health supply  
 Procurement of RDTs  
 Quarterly support supervision of health workers  
 Lockout  
 Development of national guidelines for support supervision  
 Training of 2,108 VHTs in the use of rectal artesunate  
 2010-2012

## Learning questions

Learning questions:  
 "Why do health workers give antimalarials to patients with negative rapid test results?"  
 "Community level understanding of the concept of pre-referral treatment and impact on referral related decision making"  
 2013-2014

## External quality assurance

Development of guidelines and training modules  
 Training of 20 laboratory personnel  
 EQA conducted  
 2011-2014

## Communication



Development of project microsite  
 2012



25 district leaders trained in advocacy  
 2013

Compounds

## INTRODUCTION

### Malaria in Western Uganda

At the start of the Pioneer Project in 2009, only 19 percent of households owned an insecticide-treated net, about a third of households lived within 10 km of a health facility, and approximately 23 percent of under five deaths in the region were due to malaria.

High rates of malaria in the region are linked to the intrinsically moderate to high transmission<sup>1</sup> as well as to key health system challenges. Other key challenges include limited knowledge of disease prevention practices including the delay to seek health care. Pioneer Project sought to address these challenges by developing effective ways to reduce malaria related illnesses and deaths in partnership with the Ministry of Health and through existing structures at all levels.

### A timely response

The Pioneer Project was a five year Special Initiative Grant supported by Comic Relief UK and implemented by Malaria Consortium in five districts of mid-Western Uganda: Hoima, Kibaale, Buliisa, Kiboga and Kyankwanzi. The project purpose was to reduce malaria related morbidity and mortality in the target areas and to gain a deeper understanding of the most effective approaches in achieving this objective.

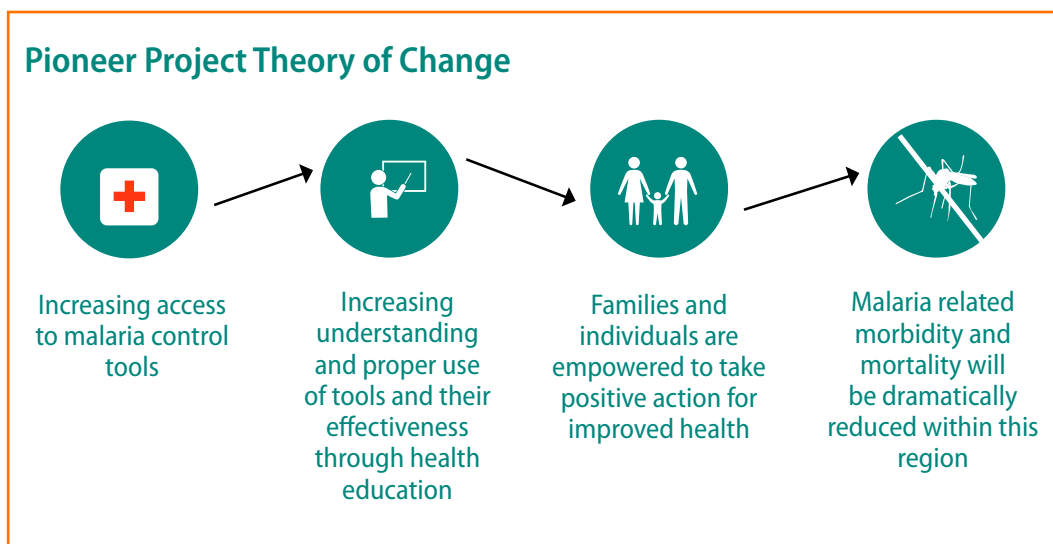
### Partners

National Malaria Control Programme

Ministry of Health Uganda

District Health Teams of Buliisa, Kiboga, Kibaale, Kyankwanzi and Hoima

Malaria and Childhood Illnesses NGO Network Secretariat (MACIS)



Systemic change is achieved when positive changes in knowledge, action and access interlink to significantly and sustainably reduce the negative impact of malaria.

Pioneer Project focused on supporting systematic malaria control by increasing both supply and demand for malaria control tools in the region. For example, if household members know that they need to sleep under an insecticide treated net, and acquire a net, they can prevent malaria.

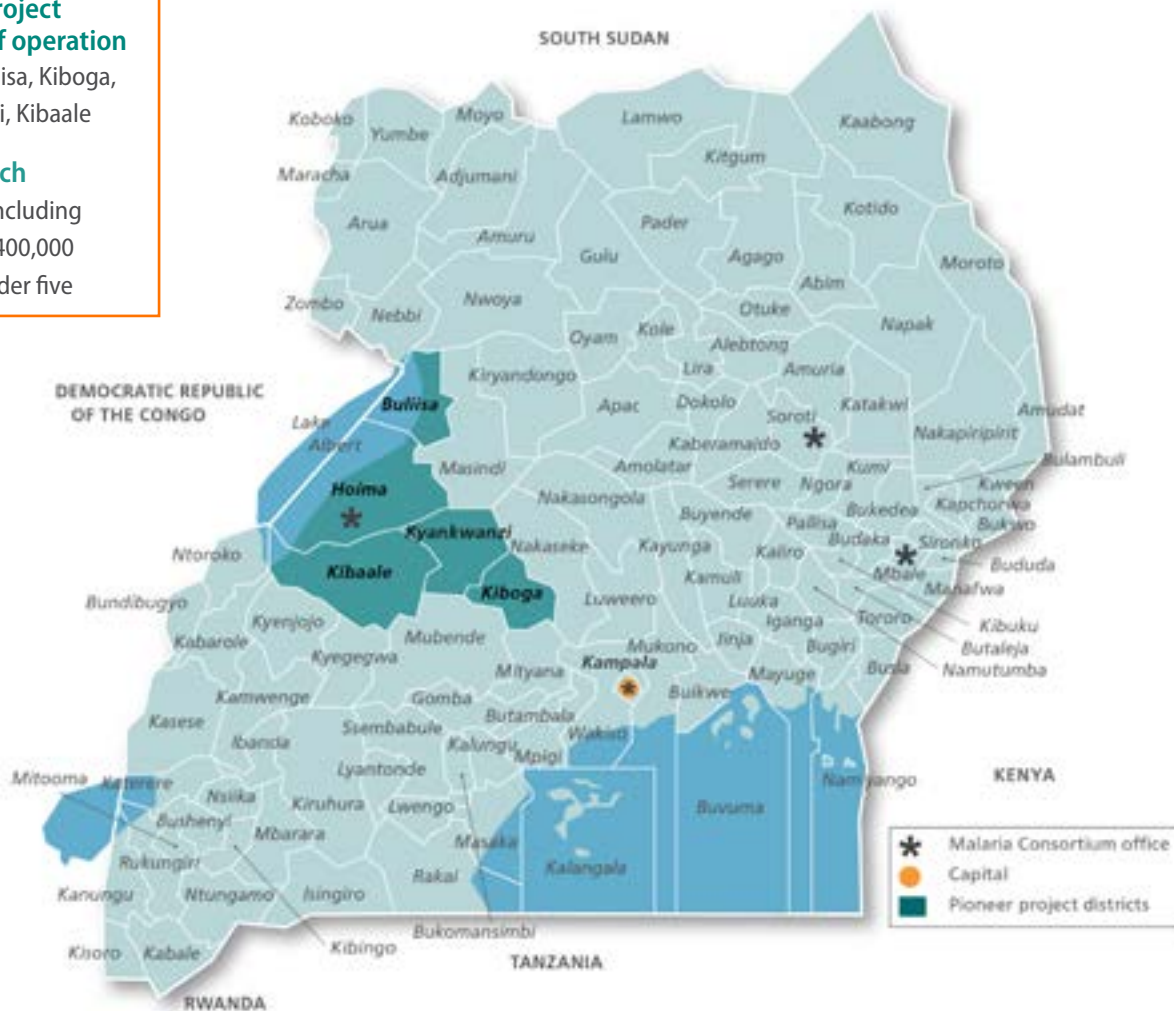
<sup>1</sup> 88% of the population lives in areas with moderate to very high transmission

## Pioneer Project districts of operation

Hoima, Buliisa, Kiboga, Kyankwanzi, Kibaale

## Target reach

1,668,547 including more than 400,000 children under five



## WINNING STRATEGIES FOR MALARIA CONTROL

- **Positive actions**  
Increase access to long lasting insecticide-treated nets (LLINs), malaria rapid diagnostic tests (mRDTs) and pre-referral treatment (rectal artesunate)
- **Practices**  
Deliver quality health care, testing before treating, seeking care on time, follow-up referrals, sleeping under an LLIN
- **Partnerships**  
Build effective relationships with the right partners for scale up of integrated services
- **Planning**  
Inclusion of key malaria control activities in the districts' annual workplans
- **Promotion**  
Documentation and dissemination of lessons learnt about best approaches for achieving systemic change in malaria control



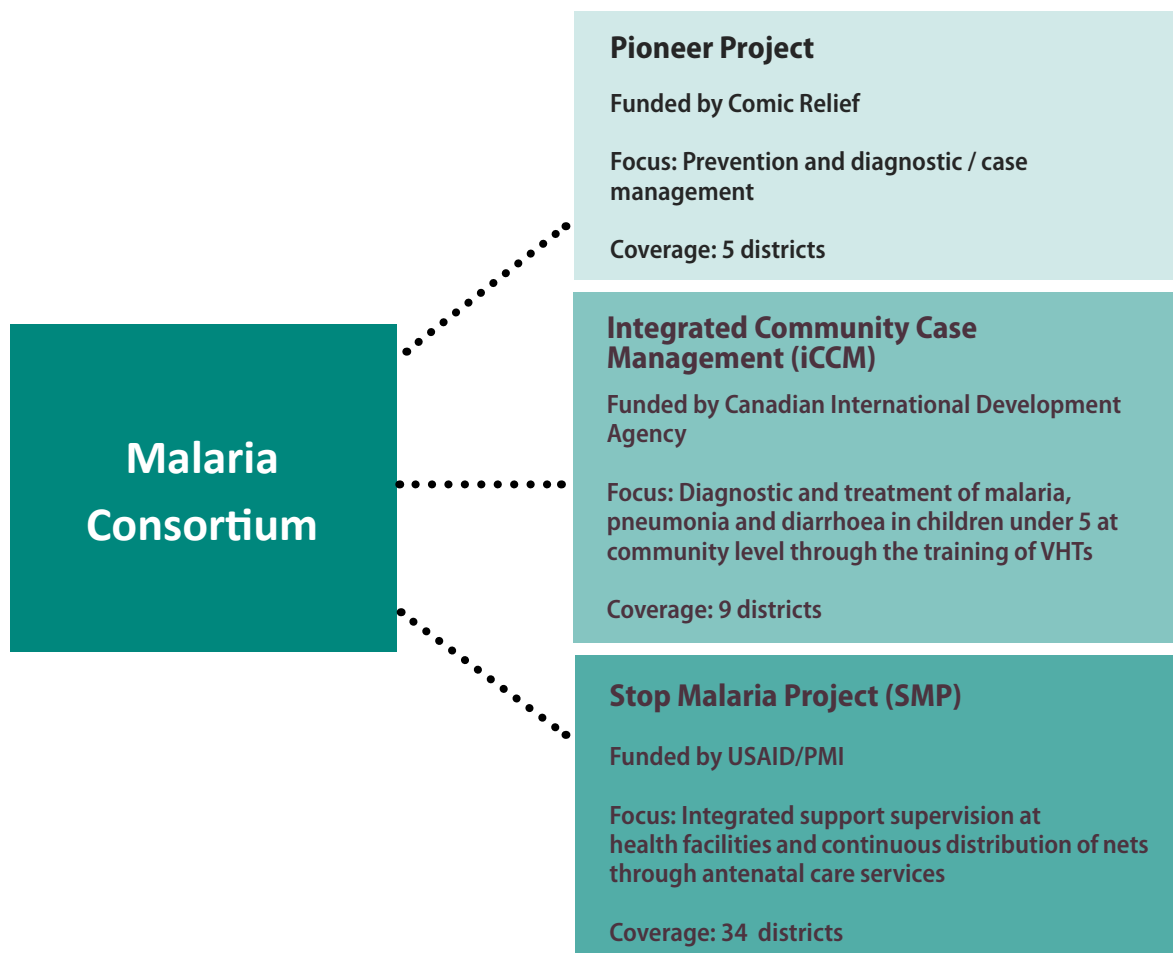
*A health worker with his job aid at the end of his training on malaria rapid diagnostic tests under Pioneer Project*

*Photo: Vicky Dawe/Comic Relief*



## MAXIMISING IMPACT THROUGH INTEGRATED INTERVENTIONS

Malaria Consortium combines interventions in order to achieve maximum impact. Three projects, including Pioneer Project, were implemented in the same region to provide different but complementary support for malaria control. The result is an integrated approach that addresses multiple challenges that communities face in fighting malaria.



### iCCM linkages to Pioneer Project

Malaria Consortium, with funding from the Canadian International Development Agency, the Bill & Melinda Gates Foundation and the UK Department for International Development/UKaid has been supporting the integrated Community Case Management (iCCM) programme in nine districts of mid-Western Uganda, including the five districts where Pioneer Project has been implemented.

Since 2010, the Government of Uganda has invested in the iCCM programme, an addition to the Village Health Teams (VHT) strategy, aiming to improve access to quality health care at the community level. Under iCCM, selected community members are trained, not only to provide health education and promotion and strengthen the link between community and health centres, but also to provide effective diagnosis and treatment for malaria, pneumonia and diarrhoea for children under five.

Malaria Consortium has supported the training of 6,774 VHTs, their regular support supervision as well as the procurement of medicines for malaria, pneumonia and diarrhoea. In addition, the research project inSCALE<sup>1</sup> has been exploring innovations that would facilitate the scale up and sustainability of iCCM.

<sup>1</sup> Innovations at Scale for Community Access and Lasting Effects





*Sewanyana Christopher, an iCCM-trained VHT in Rugambe sub-county, assesses the symptoms of a young patient*

## MALARIA CONSORTIUM PROJECTS

<p><b>Comprehensive case management</b></p> <p><b>Pioneer Project, iCCM, SMP</b></p>	<p><b>Maintaining high net coverage and use</b></p> <p><b>Pioneer Project, SMP</b></p>	<p><b>Behaviour change communication campaign</b></p> <p><b>Pioneer Project, iCCM</b></p>
<p>Timely access to effective diagnosis and appropriate treatment is important in addressing malaria, pneumonia and diarrhoea in children under five.</p> <p>By introducing diagnostic (mRDTs for malaria and respiratory timers for pneumonia) and appropriate treatment (ACTs, Amoxicillin and ORS+Zinc) at community level (iCCM) combined with the introduction of mRDTs and other health system strengthening interventions at health facility level (training in store management, integrated support supervision), Pioneer Project and SMP increased the availability and quality of these key services for children under five right in their communities.</p>	<p>Ownership and consistent use of LLINs is paramount in preventing malaria. Pioneer Project initially achieved universal coverage of nets through the mass distribution campaign. However an unexpected decline in both ownership and use started to occur after the campaign.</p> <p>SMP started distributing LLINs free of charge to pregnant mothers attending ante-natal care services. This helped maintain a certain degree of nets ownership and consistent use. It became clear that achieving and keeping a sufficient level of coverage therefore would require multiple and continuous distribution channels. Malaria Consortium is now advocating for the development of combined continuous distribution channels to widen the population reached by replacement nets after a mass distribution campaign.</p>	<p>Pioneer Project and iCCM rolled out a Ministry of Health approved multichannel behaviour change campaign combining media (radio talk shows) and community based platforms (dialogues, drama and school activations). SMP also implemented the “power of day one campaign” encouraging people to test for malaria immediately on onset of symptoms. The campaigns contributed to improved health seeking behaviours and actions for malaria control.</p>



## PREVENTION

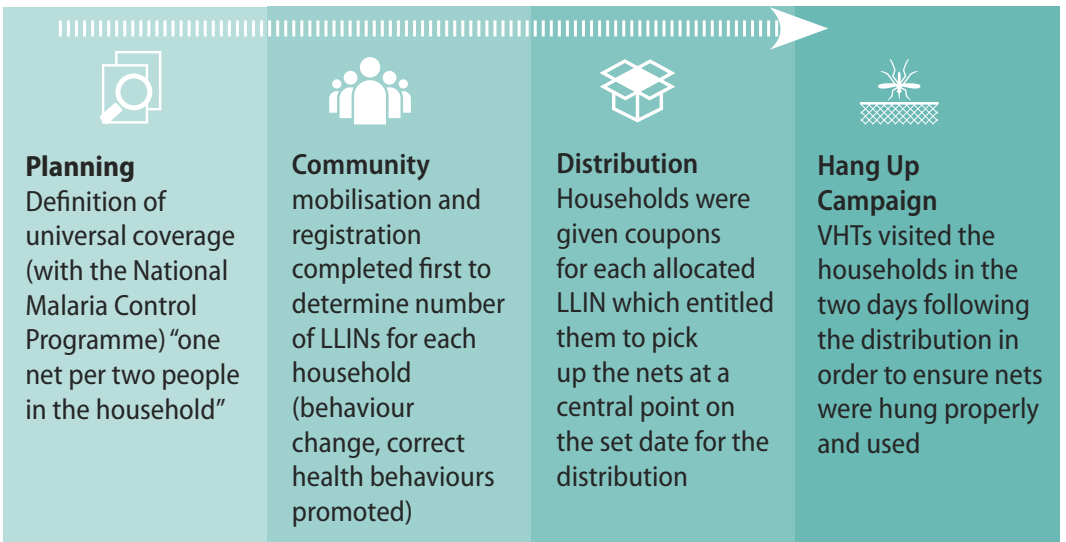
### Increasing universal and equitable access to long lasting insecticide treated nets (LLINs) through mass distribution

The Government of Uganda and its development partners have made great strides towards universal net coverage through mass distribution, which is considered the most effective way of rapidly increasing universal and equitable access for the poorest and most remote households.

Between 2009 and 2010, Pioneer Project with the Ministry of Health, carried out the **first ever mass distribution of long lasting insecticide treated nets (LLINs) across four districts: Kiboga, Kyankwanzi, Hoima and Buliisa.** This increased the percentage of households owning a mosquito net in this area from 37 percent in 2009 to 92 percent six months after the campaign.

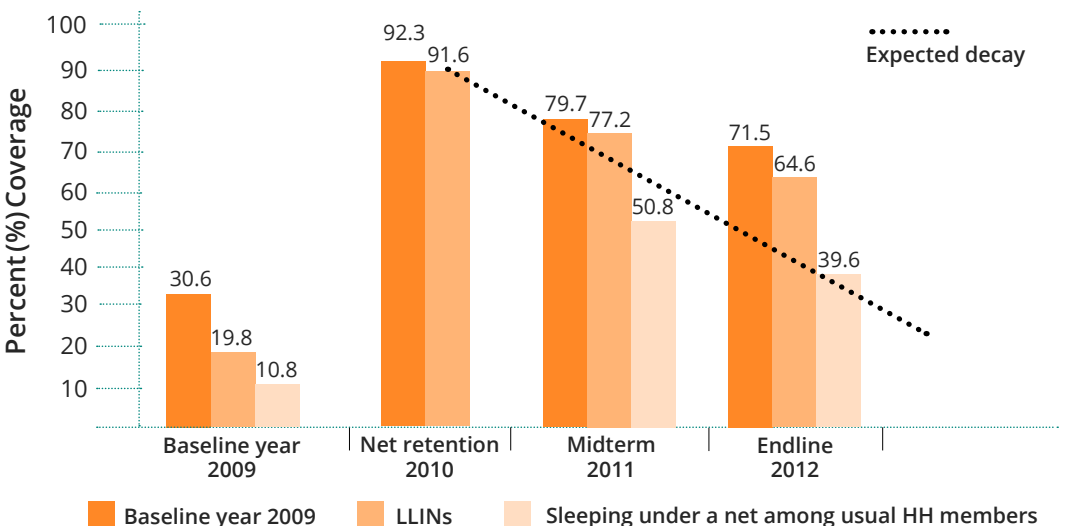
### Achieving universal coverage in four districts

A baseline survey was initially conducted to ascertain LLINs coverage and use.



### Pioneer Project impact on LLIN retention and use

The World Health Organization (WHO) estimates that 20% of nets distributed through mass campaigns are lost by the end of the first year, 50% by the end of the second year and 80% by the third year. However, three years after the Pioneer distribution, retention and use tripled the baseline figures. This can be attributed to the comprehensive behaviour change communications campaign that featured throughout the project.





Over 600,000 LLINs were distributed to 234,591 households covering over one million people to achieve universal coverage in four districts

*Rachel Kizito ensures her entire family sleeps under a net every night to prevent illness*

### Community dialogues encourage healthy practices

*“We used so much money going to the health centre day in day out. But now, even if the kids fall sick, it’s not as often as before so I don’t use as much,” says **Rachel Kizito, a resident of Kyankwanzi.***

*Rachel and her family use LLINs every day. “We have to protect ourselves from mosquitoes no matter whether it is a season in which people think there are fewer mosquitoes. They can attack you anytime; you are not aware.”*

*Rachel’s attention to her family’s safety is a result of her participation in community dialogues in her village where she has learnt how to live a healthier life to prevent illnesses. “Sometimes I would be too lazy to tuck in my net, so sometimes it would stay up. But now, as soon as it’s 6pm, I go and untie it and tuck it in carefully so that it does not let the mosquitoes in. I also used to drink unboiled water, because that’s how I was raised. But by attending those meetings, I learnt a lot of things that I do now and my family and I live a better life.”*

*“The distribution of LLINs was an appropriate intervention,” agrees **Deo Kasumba, Assistant Chief Administrative Officer, Kyankwanzi.** “It was better than just telling people to slash bushes around compounds, which was not working so well because people are cattle keepers and they look at grass as food for their cattle. In my view, prevention is most important because it saves resources. During treatment there are so many things to spend on, like tests, drugs, follow up. But if prevention is done well, a person saves all the resources they would have spent at diagnosis and treatment levels. We now need to maintain this universal coverage.”*

## EMERGING LESSONS

While mass distribution campaigns are the most effective way of rapidly achieving universal coverage and equitable access to LLINs, they are not enough to sustain this coverage (see graph on page 10). It is critical to develop a long term strategy for continuous distribution of and access to LLINs, through both the public and the private sectors. The development and successful implementation of such a strategy requires the involvement of stakeholders from both sectors under the lead of a strong public sector, accompanied by a wide and comprehensive behaviour change communications campaign.

## ENTOMOLOGICAL SURVEILLANCE

### Malaria infection rates can be tracked

Entomological surveillance is extremely important to inform accurate adaptation of prevention methods. Though the cost of this intervention is high due to the required equipment and the number of persons involved at all stages of the process, it remains a crucial intervention to maximise vector control interventions in the long term, targeting malaria elimination.

The project's entomological component involved regular surveys which attempted to evaluate the impact of the interventions on vector density and behaviour, and malaria transmission intensity. Through regularly collecting and examining mosquitoes, the project aimed at tracking the changes in mosquito density over the implementation period, assessing the entomological inoculation rates (EIR<sup>1</sup>), and observing any behavioural changes (feeding time, indoor or outdoor biting preference). **The survey findings show an overall reduction in the population density of mosquitoes, entomological inoculation and human biting rates across all the four sites in Kibaale, Hoima, Buliisa and Kiboga.**

Though it is difficult to attribute this reduction to a specific intervention, these results show that the mass LLINs distribution, combined with other malaria control interventions in the region, have had a positive impact, contributing to the reduction of malaria transmission over the project's implementation.

### OPERATIONAL RESEARCH

What are the key determinants which drive sustained or changing patterns of use or non-use of nets over time following mass campaign LLINs distributions?

Mass distribution of LLINs through universal coverage campaigns is a widely adopted approach for rapid scale-up of coverage. However, little is known about the sustainability of LLINs use over the long term, relating to the expected lifespan of the net and other factors.

**Method:** Key informant interviews were conducted with selected (male) household heads, (female) caregivers in net recipient households and selected community health workers in three districts of Buliisa, Kiboga and Hoima two years post distribution. A qualitative data collection method, the most significant change stories, captured context specific aspects of both positive and negative changes over time.

**Findings:** Factors that determine use of LLINs in the long term include subjective factors (knowledge/ perception/ experience) and objective (practical) factors. The deterioration or loss of nets varied between households due to factors such as the condition of the net, the level of influence by head of household and caregivers, the availability of replacement nets, a changing net use culture in the community, differences in attitude such as perceived economic and health benefits of net use, as well as community response to behaviour change activities to promote net use.

<sup>1</sup> The entomological inoculation rate is the number of potential infectious bites, here calculated annually





Mosquitoes are sorted before being sent to the Central Vector Control Division for further testing

Emerging data on appropriate follow up strategies to respond to community demand were shared to inform national policy on LLINs replacement. Pioneer Project also incorporated recommendations into behaviour change campaign materials including community dialogues where VHTs encourage participants to properly and consistently use nets and discuss the possibility of replacing damaged nets. Health workers were also provided with correct information to encourage consistent LLINs use by their patients.

## Entomological surveillance in practice

*The Pioneer Project supported entomological surveillance to monitor the effect of the LLINs distributed on density, behaviour and infectivity of mosquitoes.*

*Two different methods are used to collect mosquitoes:*

**Light traps:** *mosquitoes are attracted by a light and sucked into a net trap by a fan for later analysis.*

**Human landing collection:** *catches from human landing (when human beings act as bait) allow the team to distinguish between the mosquitoes caught inside and outside as well as categorising them according to the hour of capture.*

*“We are looking at the general behaviour of mosquitoes and more especially their feeding habits,” explains Charles Ntege, Vector Control Officer responsible for entomological surveillance in Kyankwanzi. “The survey showed that most of the mosquitoes bite indoors between 10pm and 5am.”*

*The morning after collection, the field team separate the female anopheles, which are responsible for the transmission of malaria, from the rest of the mosquitoes captured. These are then sent to the Central Vector Control Division in Kampala where entomologists determine how many are carrying malaria parasites. This enables them to measure the malaria transmission rate.*

*“The impact of LLINs is positive,” says Charles. “It has cut malaria transmission by about a half. This is reflected by the data available in outpatient departments. In all health centres in the district, cases have reduced, in total by almost 50 percent.”*

*Charles advocates for national policies to support continued entomological surveillance at the district level so that it can continue improve understanding of malaria transmission mechanisms.*

## CASE MANAGEMENT

### Malaria Rapid Diagnostic Tests (mRDTs)

The development of malaria rapid diagnostic tests enabled the expansion of parasitological-based diagnosis to reduce inappropriate treatment and drug wastage. mRDTs provide a simple to use, point-of-care test to enable communities to have access to effective malaria diagnosis. Following the 2010 WHO's malaria treatment policy change that was adopted by the Uganda National Malaria Control Programme (NMCP), the project pioneered the roll out of mRDTs by supporting the introduction of these testing kits in 88 health facilities across the five districts of implementation.

Introduction of mRDTs across all health centres II and III commenced with training of health workers on correct use and management of these kits. Training was supported by a comprehensive quality assurance scheme that provided for regular mentoring and support supervision by district health officers and Pioneer Project staff.

### Assessment of health facilities in project districts (2009, 2010)

- While all public health centres in all the districts were assessed to ascertain level of functional microscopy and therefore capacity for malaria diagnosis, Buliisa and Kibaale districts were prioritised because of their remoteness and the greater need for health system support.
- Building diagnostic capacity using a cascade approach:

**Step 1:** Sensitisation of key actors in the health system starting with District Health Teams to ensure buy-in to change diagnostic policy and practice.

**Step 2:** Training plans designed based on a cascade training approach in collaboration with the NMCP, which allowed for capacity building of district level trainers/supervisors to ensure that district personnel are qualified to effectively supervise and provide support to health workers on a long-term basis.

**Step 3:** Training of trainers course: Central trainers first trained District Trainers of Trainers using the national training manual on the use of mRDT in fever case management, and provided them with a standardised job aid.

Health workers training: District trainers in turn trained health workers in two phases to ensure that health facilities were not left without staff.

**Step 4:** Stocks were supplied following the training, including mRDT kits, gloves, sharps disposal boxes and clocks.

**Step 5:** Follow-up visits were carried out by supervision teams including central trainers/supervisors and district Trainers of Trainers/supervisors to assess the performance of all health workers in each facility and offer supportive guidance and feedback for improvement. Health workers were assisted to install 'mRDT corners'.

**Step 6:** Additional support supervision was conducted six weeks post-supply, and thereafter on a quarterly basis. Pioneer designed and piloted a new tool for mRDT support supervision, which has been further refined for integration into the national mRDTs programme.



Lower level health centres II and III, which lack functional microscopy to diagnose malaria, were the initial focus for mRDT introduction and training, case management - especially for negative mRDT results, record keeping and interpersonal communication.

*The malaria focal person in Buliisa, Morris Okumu, records malaria data*

## Testing before treating

*In the past, health workers at Matala prescribed antimalarials to treat all fevers. This practice has now changed following training in malaria case management under the Pioneer project. Health workers are testing first for malaria and treating only confirmed malaria cases with antimalarials. The support supervision has ensured that health workers are taking more care to ensure they carry out a proper diagnosis for malaria as well as alternative diagnosis for other common illnesses like infections and respiratory illnesses.*

*The new practice of testing before treating was initially met with resistance from patients. “Some patients did not agree with mRDTs,” says **Paul Mulindwa is a senior nursing assistant and acting in-charge at Matala health centre II.** “They come thinking they have malaria and don’t want to believe they are negative. So you counsel them and explain to them that mRDTs work and don’t lie. You don’t waste time giving treatment that is not right for the patient and delaying the treatment he really needs,”*

*Paul is also happy with the quarterly support supervision: “First of all, I get to know if I’ve done good work or wrong things. Also, you get pressured but inspired to be accurate. This support supervision has also helped us keep good records.”*

## EMERGING LESSONS

Collaboration with the Ministry of Health and NMCP means interventions can be aligned with national malaria initiatives and guidelines, and prevents duplication of resources.

Correct adoption of new diagnosis techniques using mRDTs is greatly improved by timely hands-on supervision, systematic guidance by a tool/checklist after training, and provision of tools.

Key lessons from the first round of mRDTs training in Buliisa and Kibaale pointed to the need to revise the national mRDTs training user’s manual developed in 2008. Pioneer led a collaborative technical assessment of the National mRDTs Training Manual that included the Diagnostics Technical Working Group, central mRDTs trainers and recently trained health workers from Pioneer Project districts. The sections on management of negative cases and interpersonal communication were improved and expanded.

After the first round of training, it was also observed that the implementation of an efficient participatory training, using adult learning techniques, required the use of a facilitator’s manual. After this was developed, the quality of the training improved dramatically. The manual has been adopted by the Ministry of Health.

## CASE MANAGEMENT

*“We have mRDTs everywhere. I have never found that they are missing, since they were introduced. Before, they would just treat malaria whenever we brought our children to the health centre, even when there was a different problem. But now, they test first. Even when the drugs are not there we always test to know what to do next.”*

Teddy Tomusange, Kibaale

*“I have seen positive changes since the project started. People have come to know about health decisions and how to take care of themselves. The introduction of mRDTs has been very instrumental in improving the lives of our communities.*

*“Previously, health centres would get overwhelmed with work. Every patient coming with rising temperature was thought to have malaria. But now they know that not every fever is malaria. With the introduction of mRDTs, they have learnt to ask for testing and knowing what is really wrong with them.”*

Mutumba Abdul, Secretary for Health, Kiboga

*“At first we didn’t do any test because as a health centre II, we didn’t have a lab; we treated people clinically. We use mRDTs now to help us give proper diagnosis. We take the history, test, and if they are positive we give them ACTs (artemisinin combination therapy, first line treatment for uncomplicated malaria) but if they are negative we advise accordingly. Now, the stock of ACTs is controlled.*

*“mRDTs have helped us because previously we would get stuck and have to refer patients to get medicine from other bigger places and yet sometimes it’s not even malaria.”*

*“Support supervision helps us because it detects other gaps in service delivery. At times it’s helpful because they remind us of things we have forgotten and correct us in some areas.”*

Pimpina Paul, the in-charge of Galiboleka health centre II and trained under Pioneer project on how to use mRDTs and support patients to adhere to test results.





*As the district malaria focal person, Morris Okumu has observed that the introduction of mRDTs at lower level facilities as well as in health centre IIIs and IVs to complement laboratory services, has significantly increased the number of people accessing parasitological diagnostics.*

*“More people are now going to public facilities for accurate malaria diagnosis. In Kihungya health centre II, for example, people are happy since they know that there is a test to be done.”*

*A year before Pioneer Project started, Kihungya health centre II registered close to 6,000 outpatients, in 2012 more than 9,000 outpatient visits were registered. More than 7,500 presented symptoms of fever and in the past, all of them would have been given ACTs. Thanks to the availability of diagnostic tools, less than 5,000 tested positive and were given ACTs.*

## OUTCOMES OF THE INTRODUCTION OF RDTs

- Improved supply chain management and rational use of antimalarials
- The introduction of mRDTs and training of health workers on proper supply chain management by the Pioneer project brought down antimalarial stock outs to zero in all the supported health facilities

## IMPROVING THE IMPLEMENTATION OF RDTs

- Revision of mRDT user manual and development of a facilitator’s manual and sample sessions based on lessons learnt and shared with the Ministry of Health
- Development of innovative support supervision checklist with inSCALE, another Malaria Consortium project

Mothers are key audiences for sensitisation messages about mRDTs as the majority are primary caregivers.

*Left, Teddy Tomusange with her youngest daughter*

## IN NUMBERS

**88**

The number of health centres II and III lacking microscopy trained and provided with RDTs

**1,668,547**

The number of people who accessed free, quality, confirmatory diagnostic tests for malaria through these health centres

### The numbers trained in the use of mRDTs:

**56**

district trainers

**170**

local leaders

**20**

laboratory technicians trained on external quality assurance

**1,113**

health workers, health in-charges

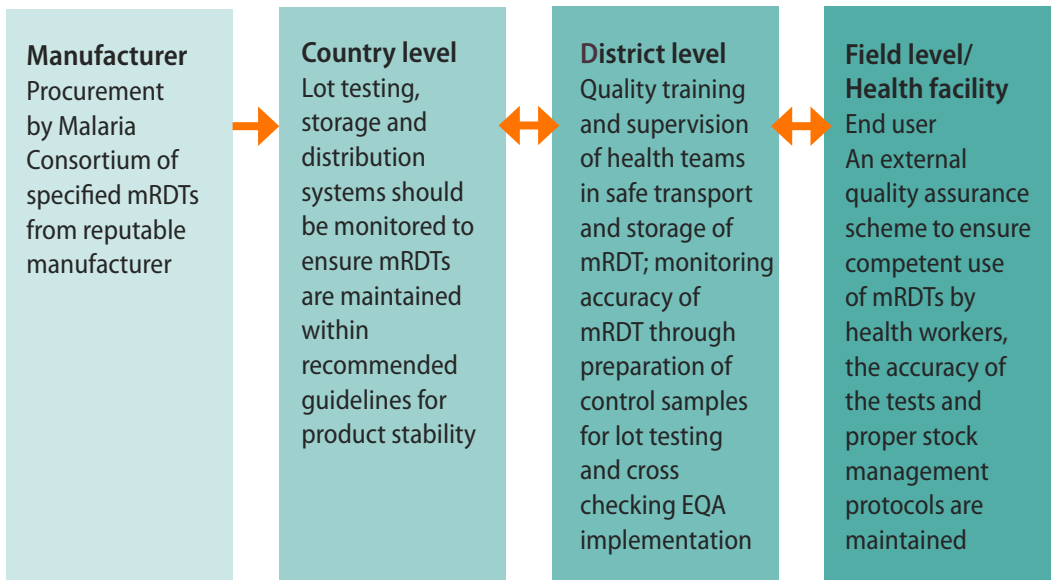
## CASE MANAGEMENT

### External Quality Assurance

Malaria mRDTs are affected by various conditions during manufacture, transport, storage and use that can impair their accuracy and reliability. Maintaining the accuracy of mRDTs therefore requires continuous and systematic monitoring, and a comprehensive quality assurance system covering all levels of implementation. Quality control reduces the likelihood of misdiagnosis and maintains the confidence of health service providers and consumers.

Pioneer Project developed guidelines to set out the requirements and procedures necessary for a quality assurance system for mRDTs in the targeted districts and health facilities. These guidelines were adapted from existing World Health Organization and NMCP recommendations.

### Quality assurance system for maintaining accuracy of mRDTs



### Transport and storage Temperature monitoring and control

Quality assurance at the field level is essential as this is where mRDT stock is most vulnerable to variations in temperature, and issues related to storage and handling. Effective quality control at this level proved critical in maintaining confidence among clinicians and end-users that the tests were working. Following the experience gained from the introduction of External Quality Assurance (EQA) at health facility level, together with recommendations from laboratory and diagnostic specialists, Malaria Consortium also introduced an EQA system at community level.



## OPERATIONAL RESEARCH

What are the determinants of provider decision-making to prescribe antimalarials following a negative mRDT result in Uganda?

### Findings:

- Knowledge and skills - Limited health worker understanding of what mRDTs detect; inadequate clinical skills to manage clients reporting for testing after self-medicating with ACTs; inability to make alternative diagnosis when mRDT is negative yet fever and malaria-like symptoms are present.
- Capacity and communication - Overwhelming workloads in addition to limited staff and equipment reduce on the ability for health workers to take adequate time to investigate negative diagnosis. Patients who have traditionally associated fever with malaria, and in the past been given antimalarials without parasitological diagnosis insist on being given the drugs or purchase them elsewhere. Others tend to be suspicious about the accuracy of the new test. The study found that health workers' inability to effectively communicate test results, diagnosis and alternative treatment greatly influenced patient adherence to test results and appropriate treatment.

*The study results led to enriched Pioneer project support to health workers on mRDTs to include effective diagnosis skills strengthening through hands on support supervision; utilisation of an alternative diagnosis tool and interpersonal communication improvement to promote effective delivery of test results, and positively influence adherence to test results. The curricula were later used to update the National mRDT User manual.*

### External quality assurance methods

Pioneer piloted two quality assurance methods to test accuracy:

#### Field stability monitoring:

In order to assess any deterioration of mRDTs performance under field conditions, mRDTs at selected sentinel sites were tested with blood samples of known parasitemia. The process is overseen by a highly qualified laboratory specialist, identified in collaboration with the Central Public Health Laboratories (CPHL) and NMCP. The specialist was also responsible for building the skills of the regional laboratory technician responsible for control sample preparation.

#### Comparative blood slides:

The sensitivity of mRDTs was also monitored by comparing mRDTs results with expert light microscopy as the reference standard. However, the correlation of mRDTs and microscopy results will never be 100 percent, as some mRDTs positive samples can be below the level of detection by microscopy, while others can have undetectable levels of mRDTs antigen but with sufficient parasites to be detected by microscopy. As well, validity of malaria microscopy results is highly dependent on the quality of blood smear preparation and reading.

### Innovative technology: Positive Control Wells

In collaboration with Foundation for Innovative New Diagnostics (FIND), Malaria Consortium conducted a study to evaluate the use, utility and acceptability of Positive Control Wells for mRDTs in routine health care settings and at community level (with VHTs). This study was carried out in two malaria-endemic districts (Kiboga and Kyankwanzi) with a view to using the results to guide rational implementation strategies. The Positive Control Wells allow the quality of mRDTs to be tested and monitored at the end-user level, addressing several of the current blocks to effective mRDTs use while complementing other EQA efforts.

## CASE MANAGEMENT

### Rapid access to care

When malaria symptoms arise, young children in particular are rapidly in grave danger and may not survive without appropriate treatment. Often the distance and the cost of travel between rural households and the nearest health facility delay or even prevent access to care. Rectal artesunate (suppositories) interrupt disease progression and are therefore a crucial intervention at the community level. Administering rectal artesunate can buy time for families to get their child to the health centre for appropriate care.

Malaria Consortium's Canadian International Development Agency (CIDA) funded integrated community case management project (iCCM-CIDA) trained VHTs on several health issues in the districts where Pioneer was operating. These included diagnosis and treatment of the three most common childhood illnesses (diarrhoea, pneumonia and malaria). The iCCM package, as per national guidelines, includes administration of rectal artesunate as pre-referral treatment for severe malaria.

### Managing severe malaria with rectal artesunate

Pre-referral treatment with rectal artesunate for severe malaria was rolled out in Kiboga, Kyankwanzi and Hoima districts in 2010. The training was funded by iCCM-CIDA, with support from Pioneer Project for the development of training tools, and involved a systemic approach under which all levels of the district were sensitised and all key actors were involved (District Health Teams and upper level health workers as trainers and supervisors). Following training, Pioneer Project equipped all VHTs with appropriate drugs and related supplies, which are restocked on a quarterly basis from nearby health facilities. The Pioneer Project team also provided technical support during the training and the routine supervision of VHTs on rectal artesunate use.

While rectal artesunate can slow down the progression of the illness, it is not a cure for severe malaria and must be followed by comprehensive case management at a health facility and a full dose of antimalarial medicine. Because caregivers may not pursue further treatment when the child appears to recover, Pioneer Project and iCCM-CIDA implemented a comprehensive behaviour change communication campaign promoting complete, appropriate care and ensured that trained VHTs were equipped to help caregivers understand that after emergency treatment their child would need additional treatment at an appropriate health facility to recover fully.

## IN NUMBERS

**8.2% to  
44.7%**

The increase in the proportion of children below five years receiving prompt and adequate treatment for fever

**2,108**

The number of VHTs in three districts of Hoima, Kiboga and Kyankwanzi trained on pre-referral treatment

**70,000+**

The number of capsules of rectal artesunate distributed to VHTs to treat children under five suffering from severe malaria

**342,052**

The number of children had access to the life-saving treatment at community level





Rectal artesunate is a lifesaving treatment for young children especially in remote areas where access to healthcare is limited

*A father with his son, whose life was saved when the VHT provided rectal artesunate to buy time for him to get to the health centre*

*When Betty's three year old daughter Lucy suddenly fell gravely ill with convulsions, Betty rushed her to the VHT. On other occasions, when I took the child to the VHT when there were no convulsions," said Betty, "the VHT would test the child for malaria and if the test was positive, she would give the treatment and the child would get better." However, this time the case was complicated.*

*"As I was doing the mRDT, the child convulsed again," recalls Joan, the VHT. "I explained to the mother that the child had a dangerous form of malaria and she required treatment from a health centre, but as the child's temperature was too high I would give a rectal artesunate to bring the temperature down quickly." Betty agreed and she was also given a referral note to the health centre, where she was relieved that she did not have to wait in the queue. Dr. Tibeita Semu, in-charge of Kikube health centre IV, explained, "When a child has been given rectal artesunate, we know it is severe malaria and we prioritise the case." Lucy was examined for signs of anaemia and a microscopy test done to confirm that malaria was present. The child was started on treatment and had recovered by the fourth day.*

*"For this particular child, the mother returned to me with the note from the health centre," remembers the VHT. "After that, I went to her home to check on the child. I have used rectal artesunate about four times and it has helped a lot."*

## OPERATIONAL RESEARCH

Assessing community level understanding of the concept of pre-referral treatment and impact on referral related decision making following provision of rectal artesunate.

### Findings:

- Caregivers' interpretation of the VHTs' advice is influenced by what the caregivers already know about rectal artesunate (RA), the trust they have in the VHTs, and the past experience with the drug which cures non-severe malaria. The willingness and ability of the caregiver to complete referral is determined not only by the interpretation of the RA treatment and advice received, but also by a number of objective factors such as time of the day/night, day of the week, perceived probability of getting health workers at the health facility, cost and availability of money for transport, and availability of support from the spouse or other family members.
- Knowledge of and experience with indigenous rectally administered medications positively contributes to the acceptability of RA, but does not seem to influence the perception of RA as a cure for severe malaria nor the decision to complete referral.

*The study enabled Pioneer Project to ensure that messages, including those in the mass media behaviour change campaign on pre-referral treatment in the community, were clear and addressed concerns about RAs that were registered in the study. Refresher training was provided to build the confidence of VHTs in administering RA, increasing awareness about the role of pre-referral treatment and providing clear, critical information to enable caregivers to follow through the continuum of care.*

# PROMOTING BEHAVIOUR CHANGE

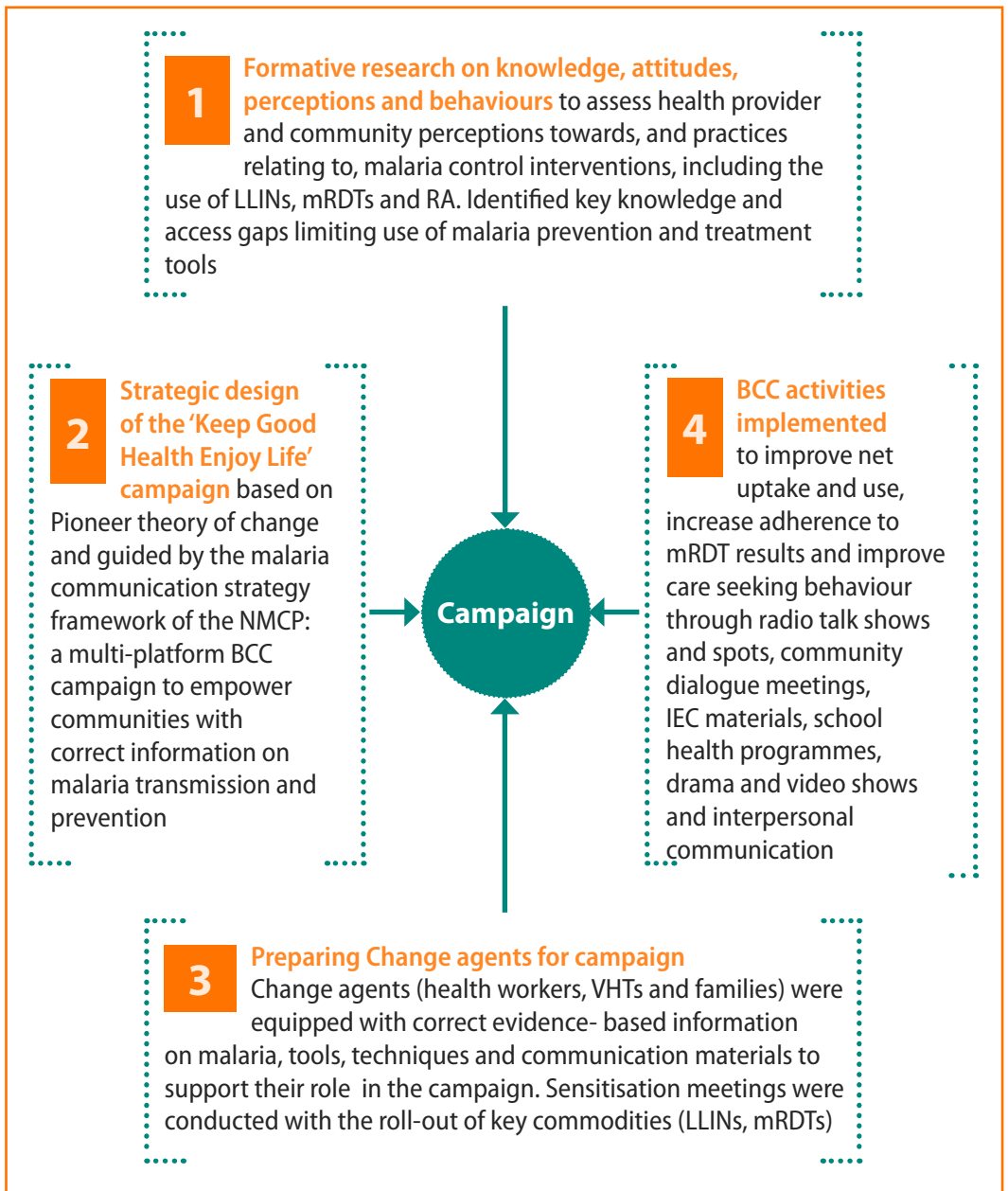
## Behaviour change campaigns

Increasing access to nets, accurate diagnostic tools and pre-referral treatment are paramount in combating malaria. However, achieving lasting impact and effective use of these tools and services requires adoption of critical healthy behaviours. The Pioneer project directed its behaviour change communications (BCC) efforts towards increasing and sustaining the use of and demand for malaria control tools and services.

### The Campaign ‘Keep Good Health Enjoy Life’

Developed in conjunction with iCCM, the campaign’s main objectives were:

- to encourage use of VHT services for children under five years
- to encourage daily use of mosquito nets
- to improve adherence to mRDT results





Key messages in the 'Keep Good Health Enjoy Life' campaign included prevention by using LLINs every day, health seeking behaviour on the onset of symptoms, access to correct diagnosis and emergency treatment in the community through trained VHTs and referral for care at a capable health centre

Left, Mike Sebwufu at Lunya Primary School one of the schools supported by Pioneer to implement behaviour change activities.

*“People didn’t know it was important to use nets. When the first batch was distributed, people misused the nets. They took them for fishing and for all other sorts of things but after these messages, people now know how to use nets. These nets that have been supplied are used. You hardly find misused nets. Even in town here, drug shops are now investing in nets. Nets have become a business because the community has understood their value and they are demanding them.*

Abdul Mutumba, Secretary for health, Kiboga

*“I think the biggest impact was achieved through radio talk shows and community dialogues. People were always given a chance to call in and they did.*

*They called and asked lots of questions. I know sometimes you can’t tell if they all will apply all the knowledge they have, but when they show interest like that, you believe they will work upon it. After all, it’s their children, their health. I attended one community dialogue and they were asking questions, which is a sign that they are listening attentively and they are interested. Dialogues were very beneficial because they made the VHTs very confident. They are leading, empowering communities with knowledge.”*

Agnes Namugenyi, District Health Educator, Kiboga

*“I have ever been treated in the clinic without testing my blood; they only took the body temperature. After hearing the radio shows, now I request for testing and I cannot accept treatment for me or my child without testing.”*

Ttito Wenyenga, Kyankwanzi



*“Community dialogues were very beneficial because they made the VHTs very confident. They are leading, empowering communities with knowledge.”*



## PROMOTING BEHAVIOUR CHANGE

### Promoting behaviour change in schools

#### “What we have learnt about malaria”

*We can go from class to class teaching fellow pupils about what we know about malaria and encourage them to talk to their parents about what they know.*

Deo Ssimbwa, school prefect for agriculture, Lunya Primary School



“Sleep under a treated net.”  
Byakatonda Joseph

“Spray with insecticide. Close doors and windows early.”  
Mukiibi Abdu

“The signposts in the compound help us in many ways. They remind us where to go when sick.”  
Tadeo

“Dry your net under the shade after washing it.”  
Nicholas Kakooza







The BCC employed through the Pioneer Project was a combination of radio spots, live talk shows with call-ins, community dialogues, school programmes that engage middle and senior level children through debate and prizes and print material

VHTs who have been trained to lead community dialogues in their respective villages

## IN NUMBERS

**30**

The radio talk shows held in the local languages on malaria, diarrhoea, pneumonia, mRDTs, and VHTs services with members of District Health Teams and political leaders including Members of Parliament as panelists

**2,848**

The number of community dialogues conducted by VHTs to teach malaria control and other good health behaviours such as the use of proper latrines, cleaning the compounds, eating healthier and caring better for children

**10,000+**

The number of IEC materials produced in English and local languages including leaflets, posters, T-shirts, and banners distributed through the VHTs to community members, especially during community dialogues and other village-based meetings to reinforce messages delivered through the other channels

**36**

The number of primary schools in Kiboga and Kyankwanzi districts supported to organise school health programmes to teach positive malaria and general health behaviours among school children themselves and through them reach their siblings and parents

*“I fell sick in February 2013. On the third day, my mother took me to the health centre and I was tested for malaria by a nurse. I was found positive and given tablets. I didn’t have a net then but soon after that my mum got me a net. Since then I have not fallen sick.”*

Joan Namatovu, student, Lunya Primary School

*Left, Joan in red T-shirt with classmates around the talking compound signpost*

### Prevention is cheaper than treatment

*“When we first distributed nets, families did not use the mosquito nets consistently due to different complaints including nets being itchy, fear of children getting burnt and nets being too hot. But they began to appreciate them and changed their attitude because of the continuous sensitisation that we did as VHTs. I spoke with parents who brought their children for malaria treatment and encouraged them to buy a net. With the use of LLINs, the rate at which children fall sick declines and parents save money because they do not buy drugs and other supplements for malaria treatment. We tell them that prevention is cheaper than treatment. This is because nowadays you cannot spend less than 10,000 Ugandan Shillings on treatment of malaria. Then there are more expenses like transportation and food. So they understand and buy mosquito nets to prevent themselves from getting malaria.”*

Kintu Moses, VHT, Kyankwanzi

## SUSTAINING GAINS IN MALARIA CONTROL

### Integrated systems strengthening

Pioneer Project used an integrated systems strengthening approach based on the premise that improvements in critical areas would translate into more significant and lasting gains in malaria control. From the start of the Pioneer Project, Malaria Consortium was mindful to work through existing structures and learn from existing and emerging best practices. We explored additional questions through operational research, built transparent mutually beneficial relationships with stakeholders at national, district and community level, while advocating for cost effective initiatives that would lead to community owned capacity strengthening and behaviour change interventions for malaria control.

### Strategic partnerships

Throughout the project we worked through Ministry of Health established systems and policies from the central institutions - especially the NMCP and the Central Vector Control Division in Kampala – to the district, sub-district and community health structures. Our approach was to build on and improve what has already been proved to work. Planning, learning and information sharing with these key actors enabled Pioneer Project to implement cost effective interventions guided by national policies.

### Strengthening capacity

To contribute to a stronger health system for effective malaria control, Pioneer Project's approach went beyond distribution of preventive and diagnostic tools to a more holistic process of building knowledge and skills at all levels of existing structures in the national health system. These addressed critical areas such as correct diagnosis, supply chain management and interpersonal communication.

### Behaviour change

In order for the interventions to become sustainable, Pioneer Project combined them with behaviour change to increase and sustain the use of and demand for the new tools and services. By providing the community members with correct information on preventing and treating malaria they are equipped to demand appropriate services from their providers as well as encourage each other to practice behaviours that control malaria.

### Advocacy

Pioneer Project advocacy efforts were focused on promoting a political and implementation environment that favours effective malaria control interventions, including their scale up. The integration of Pioneer Project learning into national guidelines for training and roll-out of mRDTs, entomological surveillance, external quality assurance and inputs into broader policy documents like the National Malaria Reduction Strategy, especially in the areas of prevention and vector control, are successes achieved in this area. Pioneer Project advocacy included both informal and formal advocacy activities, such as dissemination of learning briefs, organisation and participation in advocacy at both global and national meetings and building of effective relationships with national implementers and decision makers.



Additional advocacy efforts are required to maintain and scale up many of the Pioneer Project interventions, such as entomological surveillance, continuous supply of mRDTs, and drugs at all levels of the health system. Efforts are also needed to ensure long term strategies of continuous distribution of LLINs are finalised and implemented

*A mother receives a free net through antenatal clinic services, one of the continuous distribution channels in place in Uganda, through Malaria Consortium's partnership in the USAID-PMI funded Stop Malaria Project*

*While health workers, VHTs and community leaders have been trained on malaria control, the local council in Kiboga district decided to ensure that all community members also committed to preventing malaria in their homes to sustain the efforts of the Pioneer Project. The council passed a by-law, the Health and Sanitation bill, to encourage healthy practices which required all residents to clear compounds, create compost pits, build latrines and other health behaviour. "We want to see everyone aware and taking action, we don't want to give a chance for mosquitoes to bite our people."*

Mutumba Abdul, Secretary for Health, Kiboga.

*"If we come together and do something, we can keep these healthy practices. People are different and some may not support such efforts, but we all need to keep ourselves safe, and that's what matters most. I am willing to buy nets at a reasonable price and I hope my village mates would do the same."*

Teddy Tomusange, Kiboga

*"I plan to continue providing health education on preventing and treating malaria in the community. I will tell them just because an intervention has stopped, it doesn't mean the disease has stopped too. They have to keep bringing and testing their kids and being as vigorous as they've been to keep malaria away. I can talk to them. They need to still sleep under nets, drink boiled water, and such good practices."*

Paul Mulindwa, Senior Nursing Assistant, Kiboga

*"My fellow villagers can sit and come up with an appropriate amount to contribute to the VHTs. This can motivate them to continue with some of their work like encouraging women to take young children for treatment at the health centre."*

Annet Kyalimpa, Kibumba village, Kibaale

## KNOWLEDGE SHARING FOR INSTITUTIONAL CAPACITY STRENGTHENING

Learnings and experience of the Pioneer Project have contributed to the strengthening of Malaria Consortium expertise and interventions for malaria control.

### ➤ Strengthening malaria diagnosis and treatment

#### Comprehensive and integrated approaches

This was the most comprehensive introduction of mRDTs conducted by the organisation, integrating health system strengthening activities and the development of external quality assurance. The learnings gathered through the introduction of mRDTs on a large scale in mid-Western Uganda informed the development and design of subsequent projects. Among others, the Mbale Malaria Control Project is benefitting from this expertise. This project uses a holistic approach, intervening at all levels from the family to the hospital level, to improve health outcomes in Mbale District. External quality assurance, management of non-malarial fever and improved provider-patient communication with patients are some of the areas of focus to improve quality of care at health facility level.

#### Public-Private health service dynamics

The Pioneer Project provided the opportunity to understand the interactions between public and private sectors in malaria control. Patients who refused to accept negative test results and or preferred to get antimalarials from the private sector suffered negative consequences including treatment of non-existing malaria with ACTs or use of fake drugs. Behaviour change in the community was slowed down by the persistence of old methods in the private sector. This triggered the design of a project that would encourage the availability of mRDTs in private clinics and drug shops (through market interventions) as well as foster a culture of testing (through training of service providers and a communication campaign for users).

### ➤ Effective methods of LLINs distribution

Pioneer Project's universal coverage distribution of LLINs was the first of its kind in Uganda. In addition to informing national guidelines on universal coverage, the experience gained by Malaria Consortium in logistics and planning was tremendous. Thanks to the capacity built, Malaria Consortium Uganda was selected to lead the first country wide universal coverage distribution campaign funded by Global Fund in 2013/2014.



*Community members queue to receive nets during the Pioneer Project mass distribution in Hoima district in 2009  
Photo: Comic Relief*





The Pioneer Project helped increase availability of mRDTs at health facilities to strengthen behaviour change efforts designed to encourage testing before treating

*Patients wait to be seen at Kisala health centre*

In addition, the drop in use and coverage of nets which was observed one year after the distribution led to various research projects and discussions within the organisation. The Malaria Control Culture Project, implemented in Tororo District, has been designed to pilot initiatives combining continuous distribution channels that provide replacement nets to households after a mass distribution campaign. Numerous anecdotal evidence also shows that people are ready to buy replacement nets once they have experienced their benefits, which confirms the potential role of the private sector in increasing the availability of nets. Malaria Consortium is advocating for the consideration of the private sector in the national strategy for continuous distribution.

### ➤ Strategies for Behaviour Change Communication

Although the approach of community dialogues has been used by other organisations and in other countries by Malaria Consortium, the introduction of community dialogues in the mid-Western of Uganda provided a strategic opportunity of great learning for Malaria Consortium. Training materials, dialogue guides and visual support for dialogues facilitators are now being used by the facilitators in Tororo district to foster a culture of disease prevention, appropriate diagnosis and treatment in the district. The experience developed by Pioneer Project in school-based behaviour change communication activities will also be applied and further explored in Tororo.

*Right, health workers receive training in the use of malaria mRDTs. Photo: Tadej Znidarcic*

*Inside back cover, a woman washes the mosquito net she received through the Pioneer Project*



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Malaria Consortium would also like to thank the Ministry of Health of Uganda, through the National Malaria Control Programme and the Central Vector Control Division for their support and involvement throughout the life of the project.

The success of the Pioneer Project would not have been possible without the tremendous input and constant support from the districts of Buliisa, Hoima, Kibaale, Kiboga and Kyankwanzi, through their District Health Teams as well as their political leadership. We also wish to extend our thanks and gratitude to health workers, at all levels, and Village Health Teams. The commitment of these teams is an inspiration and great motivation for our staff and is paramount to the success of our interventions.

The support of our partners, the Malaria and Childhood Illnesses NGO Secretariat (MACIS), and cooperation with various NGOs has also been very valuable for the project and the organisation.

Malaria Consortium would like to take this opportunity to acknowledge the great commitment of communities, their strength when facing challenges like malaria on a daily basis, and their determination to improve their lives.

Malaria Consortium also wants to acknowledge the crucial role of international partners, especially the Canadian International Development Agency (CIDA), USAID – President Malaria Initiative, the Department for International Development/UKaid, UNICEF and the Bill & Melinda Gates Foundation, in the success of Pioneer Project interventions and the learning generated.







*A Pioneer Project trained health worker carries out a malaria RDT on a young patient  
Photo: Vicky Dawe/Comic Relief*

Malaria Consortium is one of the world's leading non-profit organisations specialising in the comprehensive control of malaria and other communicable diseases – particularly those affecting children. Established in 2003, Malaria Consortium works in Africa and Asia with communities, government and non-government agencies, academic institutions, and local and international organisations, to ensure good evidence supports delivery of effective services for disease control.

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