Malaria Consortium

2003-2013: a decade in communicable disease control and child health



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Thank you

The last 10 years for Malaria Consortium have been made possible thanks to the unwavering support of our donors, partners and collaborators from across the world. Collaboration and cooperation with others has been the cornerstone of all our achievements in the fight against malaria and other communicable childhood and neglected tropical diseases. It is thanks to these partnerships that we are able to provide some of the world's most vulnerable people with better health care and offer them a chance for a future free from the burden of diseases which are treatable and preventable.

A key focus of Malaria Consortium has been effective diagnosis of malaria which helps save millions of lives



Dr Julian Lob-Levyt Chair

"For the first time, the goal of elimination is starting to look achievable in a number of countries in Africa, an aspiration that would have been dismissed as unrealistic a decade ago"

Growing through innovation and partnership

Malaria Consortium was founded by a small team of people with a vision – to build the capacity of malaria-endemic countries worldwide to deal with a common and treatable disease that was devastating the lives of poor and vulnerable communities.

Over the course of a decade of innovation and strong partnerships, this vision has grown from focusing solely on malaria control and prevention, to include integrated approaches to improving child health and neglected tropical diseases. Now working across <u>Africa and Asia</u>, we are delighted to take the opportunity of our anniversary to reflect on what we have achieved.

For the last 10 years, the global fight against malaria has seen an incredible acceleration. Since 2000, global prevention and control efforts have led to a significant decline in mortality rates across all ages, but especially in children worldwide. For the first time, the goal of elimination is starting to look achievable in a number of countries in Africa, an aspiration that would have been dismissed as unrealistic a decade ago.

Today, Malaria Consortium partners with ministries of health in 15 countries to combat disease and improve child health. We work in six of the 25 highest malaria burden countries in the world, in post-conflict countries and in areas of Southeast Asia where drug resistance is a developing threat. Whilst the organisation has grown significantly, our focus on the national and grassroots level has enabled us to remain an effective on-the-ground partner, which has meant that in all that we have done, we have continued to build capacity in the countries where we work.

We remain as committed as our early pioneers in ensuring that we continue to fight malaria, a disease that is both preventable and curable. Looking forward, we will continue to grow as an organisation but with a renewed focus on developing integrated strategies that address malaria and other communicable diseases beyond 2015. These strategies will need continued investment, more effective treatments and new tools to maintain the progress that has been made.

We would like to extend a huge thank you to our partners and supporters who have worked alongside us for the last 10 years. It is because of these partnerships that we are able to continue the fight against malaria and other infectious diseases, providing communities worldwide with the support they need to have a future free from disease.

Finally, and on behalf of the board, I would like to personally thank the staff and leadership of Malaria Consortium – both past and present. Without their dedication and professionalism, we would not be the respected and effective organisation that we have become.

Malaria Consortium: our birth and growth

Dr Sylvia Meek Technical director



Alaria Consortium's first organisational strategy meeting in 2004, including its founders Sunil Mehra (front row, third from right), Graham Root (middle row, centre) and Sylvia Meek (middle row, second from right)

2 Malaria Consortium: our birth and growth



The first 10 years

For over a decade the global fight against malaria and other infectious diseases across sub-Saharan Africa and Asia has seen a remarkable acceleration.

Malaria Consortium grew out of the early 1990s when malaria was an extremely neglected disease, whose control was still suppressed by the backlash to the failed global eradication attempts of the 1960s. We started as a non-government organisation (NGO) in September 2003 with our official launch in 2004 under the leadership of Sunil Mehra as our first executive director, Graham Root as our Africa director and myself as technical director. The three of us had been involved in a previous project, also called Malaria Consortium, which was a collaboration between the London School of Hygiene & Tropical Medicine and the Liverpool School of Tropical Medicine to run a resource centre on malaria control for the UK's Department for International Development (DFID). It predominantly focused on advising DFID on malaria control investment, designing new programmes and evaluating existing ones.

After nine years, DFID decided to move on to a general health resource centre, and that is when Malaria Consortium the NGO was born. We not only wanted to continue the work of the original consortium, advising on policy and strategy, but we also wanted to focus more on malaria control implementation, learning directly from country programmes and building local capacity in endemic countries. We wanted to work with ministries to do more with the resources available, trying out new approaches to shape comprehensive malaria control programmes. We did not want to start up an organisation that duplicated what others were doing, but to fill a gap we had found. We felt some impatience at the sometimes over-theoretical debates, such as the competition between investing in malaria

control versus health systems strengthening. Malaria control needs strong health systems, and the systems have to serve a purpose. We saw the importance of staying practical and continuously testing and improving service delivery. The weakest points in many systems are where two elements meet, and we aimed to bridge these points between research and implementation, facility and community, public and private.

We were also keen to incorporate child health into our work on malaria and over the past four years we have expanded our activities in this area, with our work on integrated community case management (ICCM) of malaria with diarrhoea and pneumonia in young children. <u>Neglected tropical diseases</u> have similarly become an additional focus, given the synergies with malaria control.

Malaria Consortium has achieved some significant successes over the past decade and you can read about a number of the highlights in this publication. I was particularly inspired by the first mass net distribution that our team organised in Nigeria. Another highlight was visiting the ICCM programmes that we continue to run in South Sudan. It was encouraging to see how community health workers that we have trained in the country, many of whom have low literacy, were performing their work in such a complex environment confidently and with great effect. I have also been extremely impressed seeing the practical information systems that have been set up in Asia which are supporting the urgent challenge of eliminating artemisinin resistance and helping to set the stage for malaria elimination in the area. Another highlight has been our ability to communicate better what we are learning through project materials and publications.

At the centre of all our work has been partnership and collaboration. We have played a key role in setting up and supporting the global Roll Back Malaria Partnership (RBM). Our executive director at that time was the NGO representative on the RBM Board, and several of our staff are involved in different working groups. We have developed partnerships with a number of other organisations and academic institutions for consortium-style projects and learned a great deal about how best to work in partnership. Our partnerships in country have been fundamental to success in all our work, and we are delighted to have strong relationships with the ministries of health in all of them. We have provided them with support in taking forward to implementation a range of new policy directions over the years, such as the shift in policy on malaria diagnosis in Uganda and the various policy changes needed for the introduction of ICCM.

There has been one constant throughout the growth of Malaria Consortium, and that is the calibre and dedication of its staff, including technical, financial, management and operational, who make the organisation a place where people enjoy working.

"The weakest points in many systems are where two elements meet, and we aimed to bridge these points between research and implementation, facility and community, public and private" The organisation has a strong culture of debate, and encouraging staff to express ideas has meant that programmes have been developed to the highest standard. The <u>Programme Partnership Arrangement</u> with DFID over the past three years has helped to expand this by allowing us rapidly to pursue new ideas and projects.

With around 90 percent of our staff based in the countries we support, we have also been able to understand the context and what is feasible, and develop strong partnerships with different stakeholders at country level. It has been crucial to show that real technical leadership can come from within the countries themselves.

As we celebrate a decade of working in communicable disease control and child health, I like to think that what Malaria Consortium has achieved really has helped reduce malaria in the areas where we have worked. There are always challenges when working in global public health, but we do still have extremely effective tools at our disposal. The most important thing is not to become complacent.

I would like to conclude with a message from our first executive director Sunil Mehra, who says: "I am hugely honoured by the dedication of all the people who have worked, contributed and given so much to Malaria Consortium, so today we can celebrate the incredible achievements of the first 10 years. I would like to thank them all from Ethiopia to Mozambique, from Uganda to Nigeria and from Myanmar to Indonesia. My hope when I founded the charity, with help from Pene Key, our first trustee, who successfully recruited most of our first board, and our team, was to create a charity that exemplified the best synergy from diversity and that thus encouraged innovation and achievement amongst all - thank you for helping to realise our dream. Wishing the new leadership another fantastic 10 years."

In Nigeria, we have helped build demand for malaria related health services through training, support and behaviour change communications. Here women attend an antenatal clinic and receive free nets and preventive treatment for malaria

We led a single mass drug administration that treated

230,000 people

for schistosomiasis in South Sudan



Timeline 2003-2013



2003

- Malaria Consortium is launched as a nongovernment organisation. Our mission: to bring to poor people relief from and protection against communicable diseases, especially malaria
- Malaria burden
 Over 1.1 million deaths
 worldwide from malaria

1,100,000 deaths worldwide from malaria



2004

 Country offices open in London, Uganda, Ghana, Ethiopia and Zambia

Internal developments Embarks on a seven-year project in five African countries (Clover), strengthening health systems for malaria control

Leads first of a series of national malaria surveys in Cambodia, repeated every three years to 2013

Starts six-year project to improve services for tuberculosis in Northern Uganda

External developments

The UK All Party Parliamentary Group on Malaria and Neglected Tropical Diseases is launched to inform parliamentarians of the negative impacts of malaria and neglected tropical diseases • Country offices open in Sudan and Mozambique

2005

 Internal developments
 Widen scope to cover other communicable diseases.
 Work starts on neglected tropical disease control, including schistosomiasis and on tuberculosis control among internally displaced people in Uganda

Focus on those most at risk and most vulnerable – including in northern Uganda and Sudan/Darfur

Successful implementation of large-scale net retreatment campaign, Uganda

External developments

A five-year, US\$1.2 billion expansion of US government aid for malaria is launched: the President's Malaria Initiative (PMI)



2006

COMDIS launched with Malaria Consortium as partner to research and develop interventions that would provide better health care for those affected by communicable diseases

• Internal developments Work starts on neglected tropical diseases in Southern Sudan





2007

• Launch in Asia: Thailand (regional office), Cambodia

Sudan office moves to Juba, Southern Sudan

Internal developments

Establishes communicable diseases resource centres in Ethiopia and Mozambique

Advocacy coalitions against malaria are created, comprising civil society organisations and private and public sector stakeholders in Ethiopia and Cameroon

Over the last three years 210,000 nets distributed to internally displaced people in Sudan and northern Uganda

Assist in the roll out of antimalarial drugs (artemisinin combination therapy) in Mozambique through training 234 community health workers in Inhambane province

External developments

World Malaria Day (April 25th) is established by the United Nations

The Bill & Melinda Gates Foundation hosts a malaria forum to review progress in malaria control, share challenges and successes, and re-introduce ambition for eradication





2009

malaria

in Ethiopia

malaria

in Southeast Asia

• Internal developments

Integrated community case

by Canadian International

starts in Mozambique,

management project funded

Development Agency (CIDA)

Southern Sudan. Uganda and

Zambia to tackle childhood

diarrhoea, pneumonia and

• inSCALE starts in Uganda and

Mozambique to support the

motivation and retention of

community health workers

distributes 4.5 million LLINs

Clinical audits are introduced

as a method of improving

quality of care at 29 health

facilities in Uganda and 62

Role in monitoring, evaluation,

surveillance and research for

artemisinin resistance grows

External developments

The Africa Leaders Malaria

heads of state to combine

efforts across country and

regional borders to fight

Alliance is founded by African

Malaria Consortium



2008

Country office opens in Nigeria

• Internal developments The Support to National Malaria Programme (SuNMaP) launches in Nigeria

Support begins for the containment of drug resistant malaria in Asia

Efforts to build national malaria capacity across programmes are stepped up

Malaria Consortium extends operational remit to include other childhood illnesses

Over 1.1 million nets (including long lasting insecticidal nets - LLINs) have now been distributed by Malaria Consortium

External developments

The Boll Back Malaria Partnership launches the Global Malaria Action Plan. committing nearly US\$3 billion towards reducing the number of malaria deaths to near zero by 2015

The Asia Pacific Malaria Flimination Network is launched to address the unique challenges of malaria elimination in the region





2010

• Internal developments Mass drug administrations begin in Southern Sudan for schistosomiasis, reaching over 30,000 and 24,000

reveals dangers of current practice for severely ill children

Acclaimed Malaria Consortium/Adam Nadel exhibition Malaria: blood. sweat. and tears launches at UN in New York

7,000 health workers are trained in over 3.000 health facilities in Nigeria

Cambodian Malaria Bulletin supports better malaria surveillance

External developments A decline in the malaria burden is noticeable in

many countries

2011

Internal developments

Work starts on community based detection and management of acute malnutrition in South Sudan. screening over 2,000 children

COMDIS-HSD starts - a research programme consortium led by University of Leeds, on health service delivery

230,000 LLINs are distributed in Mozambigue and a further 1.5 million through other partners

230,000 people receive

Approximately 200 health workers are trained in the



Beyond Garki

2012

Internal developments

NetCALC is developed to

LLIN requirements

assist countries in calculating

First large-scale household,

designed in new artemisinin

resistance containment areas

outlet and health facility

survey in Myanmar is

Long-term multi-country

formally established to

epidemiology

initiative Beyond Garki is

monitor changing malaria

Mass drug administrations

238,000 people) and soil

carried out in South Sudan

Across Africa programmes,

workers from all levels in

the health system receive

training and nearly three

million LLINs distributed

The London Declaration

on NTDs is launched,

toward eliminating or

External developments

representing a coordinated

effort to accelerate progress

controlling 10 NTDs by 2020

more than 5.100 health

transmitted helminths

(300.000 people) are

for schistosomiasis (reaching

627,000 deaths worldwide from malaria

2013

Country office opens in Mvanmar: Zambia closes

Internal developments

New focus on seasonal malaria chemoprevention in northern Nigeria

New project improving access to injectable artesunate to reduce mortality from severe malaria

New project rolling out malaria rapid diagnostic tests for private sector in Nigeria and Uganda

Mass country-wide LLIN distribution through government/Global Fund/ PMI partnership in Uganda with 10 million nets distributed

External developments

The Integrated Global Action Plan for the Prevention and Control of Pneumonia and Diarrhoea launches

Malaria Consortium becomes a member of the new WHO Malaria Policy Advisory Committee

 Malaria burden An estimated 207 million cases of malaria, causing 627.000 malaria deaths



soil transmitted helminths and beneficiaries respectively

Trachoma mass drug administration is carried out in Unity state. Southern Sudan

FEAST project clinical trial

treatment for schistosomiasis in one mass drug administration in South Sudan

use of intermittent preventive treatment of malaria for pregnant women in Uganda

Our evolution at country level

Across the countries where we work, there have been many successes that have helped to bring us to where we are today



Malaria Consortium delivers long lasting insecticidal nets to some of the hardest to reach areas in Uganda Central region through the Stop Malaria Project

Uganda

The <u>Uganda</u> programme was Malaria Consortium's first strategic move in pursuit of its mission of reaching those most in need of malaria interventions. We have since run 15 projects, building our reputation with the Ministry of Health and the donor community.

Through interplay between three of its projects in Midwestern Uganda – the <u>Pioneer project</u> for mass net distributions and low level health system strengthening (Comic Relief), integrating case management of malaria with pneumonia and diarrhoea (Canadian International Development Agency – CIDA), and the <u>Stop Malaria Project</u> (USAID) – the programme demonstrated that a multifaceted intervention approach considerably strengthened impact in malaria control. The successful roll out of large scale social marketing activities for the AMFm pilot (Global Fund) reflected the growing experience of the programme in behaviour change communication approaches.

We also accumulated experience and expertise in net distribution through routine distribution (at ante-natal clinics) as well as targeted and universal campaigns. We are currently the leading organisation working with the Ministry of Health to distribute 21 million long lasting insecticidal nets (LLINs) across the country (<u>Global Fund/PMI</u>).

Our support to the Ministry of Health on malaria diagnostics has also been significant through development of guidelines for parasitological based diagnosis, training in rapid diagnostic tests and external quality assurance.

Key successes

- Training 1,640 CHWs on directly observed TB treatment, and 75 health and lab workers in TB diagnosis and treatment in northern Uganda
- Working with the Ministry of Health to introduce integrated community case management (ICCM)
- Rolling out ICCM to 17 districts, training 13,000 community health workers reaching an estimated population of 890,000 children
- Training over 1,000 health workers on malaria rapid diagnostic tests
- Delivering the first ever district-wide LLIN distribution to attain universal coverage
- Leading in the distribution of 21 million LLINs to attain universal coverage for the population

Ethiopia

Malaria Consortium started work in Ethiopia, in response to a need for malaria expertise in the SNNPR region of Southern Ethiopia. We became the only organisation engaged in the malaria control programme in the region and implemented the <u>Clover project</u> (Irish Aid) there from 2004. The focus was on health system strengthening in order to contribute to the improvement of the National Malaria Control Programme at district level. Our work on increasing the capacity for monitoring and evaluation has resulted in improved planning and reporting.

Operational research has been a constant focus throughout Malaria Consortium's time in Ethiopia, with studies on rapid diagnostic tests for malaria, vector resistance to indoor residual spraying, and most recently the <u>Beyond Garki project</u> (UKaid/ DFID). We have engaged in a range of behaviour change communication activities including antimalaria school clubs and community dialogues on malaria (Global Fund). We have developed strong advocacy groups with the establishment of the <u>Coalition Against Malaria in Ethiopia</u> and Coalition of Media Against Malaria in Ethiopia (GlaxoSmithKline, MACEPA/PATH, Sumitomo). We have focused on strengthening the health management information system in Southern Region through the provision of computers, training and motorcycles to improve supervision.

Looking forward, we will roll out the use of injectable artesunate for severe malaria and commence a project focusing on <u>pneumonia diagnostics</u>.

- Leading in coordination of the Ethiopia National Malaria Indicator Survey 2011
- Co-developing malaria communication strategy with the Southern Region Health Bureau
- National training of health workers to develop knowledge and skills in malaria diagnosis, treatment and epidemic detection
- Carrying out operational research to develop and test new malaria surveillance strategies
- Establishing school-based anti-malaria clubs in Southern Region
- Establishing malaria laboratory external quality assurance systems in 50 health centres in malaria hot-spots in Southern Region

Nigeria

Malaria Consortium's presence in <u>Nigeria</u> has grown from the success of the Department for International Development (UKaid/DFID) funded <u>Support to National Malaria Programme</u> (SuNMaP). This £89 million, seven year project is designed to strengthen malaria control efforts at the national level and in a number of states. Through SuNMaP, we are taking the lead in supporting the continuous distribution of LLINs and developing the market for anti-malaria commodities. We are ensuring the harmonisation of partners' activities in malaria control, and demand creation for preventive and case management services.

The achievements recorded by SuNMaP have contributed to Malaria Consortium's success in starting up other projects in Nigeria, including <u>Malaria Action Plan for States</u> (President's Malaria Initiative/USAID), <u>seasonal malaria chemoprevention</u> (Bill & Melinda Gates Foundation) and Rapid Access Expansion – <u>RACE</u> (World Health Organization (WHO/CIDA). The project has also positioned us as a key partner with the global Roll Back Malaria Partnership, and in supporting national and state malaria control programmes to take the lead in reducing the burden of malaria in the country.

The Nigeria programme aims to extend its role to the control of neglected tropical diseases (NTDs), especially lymphatic filariasis. We will also work to improve access to case management at the community level and to integrate with other common childhood diseases.

Key successes

- Distributing six million nets in Kano and Anambra and developing tools and coordinating mechanisms for national distribution of over 53 million LLINs
- Administering seasonal malaria chemoprevention drugs in Katsina, reaching over 176,000 children
- Supporting the first malaria indicator survey in 2010 and malaria programme review in 2012
- Developing action plans for implementation of malaria control programmes in 10 states
- Comprehensive training package for nationwide roll-out to improve quality of case management in service delivery points
- Initiating a project to control <u>severe malaria</u> in health facilities across three states

Zambia



▲ Dialogues led by trained community health workers are encouraging better health-seeking behaviour

Malaria Consortium opened an office in Lusaka, Zambia to implement a health systems strengthening project: <u>Clover</u> (Irish Aid). Our close collaboration with the National Malaria Control Centre (NMCC) through Clover directly resulted in being chosen in 2007 to implement a study on use of malaria rapid diagnostic tests (RDTs) as part of home management of malaria in Livingstone district. This relationship also led to our involvement in the Zambia Access to ACTs Initiative, conducting research on subsidised distribution of artemisinin combination therapies (ACTs) and RDTs from accredited drug dispensers.

In 2009, Luapula province was selected as one location for our <u>multi-country ICCM programme</u> (CIDA). At the conclusion, in 2013, Malaria Consortium's Zambia programme closed down.

- Establishing district-level public-private Malaria Task Forces across 19 districts (Irish Aid – Clover)
- Completing research (funded by WHO) on use of RDTs within a home management of malaria programme; partnering with NMCC to implement first roll-out as national strategy in Livingstone district
- Provision of treatments for malaria, pneumonia and diarrhoea by community health workers to more than 170,000 children under five in Luapula province (ICCM-CIDA project)

South Sudan

Malaria Consortium began operations in <u>Sudan</u> in 2005, training doctors in malaria case management and delivering LLINs to displaced people. By 2007, the programme increased its activities in southern



A child is assessed for severe acute malnutrition using a MUAC (measuring midupper arm circumference) tape Sudan, supporting assessment, mapping and administration of NTDs.

Based in Juba, the programme continued to support the National Malaria Control Programme and the new South Sudan government with their malaria policy documents and treatment guidelines. We have been involved with mass net distributions in Unity and Northern Bahr el Ghazal. The programme in these states also expanded to include ICCM and used these established networks to <u>diagnose and treat</u> <u>malnutrition</u>, a chronic health issue for many young children in parts of the country.

We provided technical support to the Government of South Sudan as it developed its Malaria Control Strategic Plan and fed into the 2011 Health Sector Development Plan. We have since been involved in developing ICCM guidelines and harmonisation of ICCM training materials between all partners.

We aim to expand our ICCM activities to reach more children under five, providing more than 20 million treatments for NTDs and improving pneumonia diagnostics.

Key successes

- Providing support to the National Strategic Plan for NTD Control
- Working closely with Ministry of Health to support them in developing guidelines for malaria control and treatment of malnutrition
- <u>Mapping trachoma and other NTDs</u> across South Sudan
- Evaluating a community net distribution approach to move towards continuous distribution through a pilot in Central Equatoria State
- Winning an award for "operational excellence in a difficult environment" for this pilot award for our <u>LLIN continuous distribution</u> work in Lainya County
- Working with Ministry of Health and other NGO partners to introduce ICCM
- First NGO practising management of severe acute malnutrition at community level with the development of outpatient therapeutic feeding sites

Ghana

Based in the Promoting Malaria Prevention and Treatment (ProMPT) project office, the Ghana programme allowed Malaria Consortium to support delivery of an effective high quality malaria control programme across the whole country. In collaboration with partners, ProMPT helped Ghana move closer to achieving the national goal of universal coverage of LLINs (one net for every two sleeping places) through an innovative door-to-door hang-up campaign.

As a result of the successful implementation of seasonal malaria chemoprevention in northern Nigeria, we are hoping to extend these to some areas in northern Ghana.

- Distributing more than 12.5 LLINs through ProMPT project
- Developing and piloting a strategy for managing malaria in pregnancy, as well as a supportive supervision tool
- Developing and piloting a strategy for continuous distribution of nets in Eastern Region, now managed by <u>NetWorks</u> (USAID)

Mozambique

Malaria Consortium's programme in <u>Mozambique</u> was set up as a result of a project to develop <u>sustainable LLIN distribution systems</u> for malaria prevention in the country (UKaid/DFID). This was achieved through private sector development and health systems such as ante-natal clinics.



▲ Laboratory technicians in Mozambique were trained to diagnose malaria as part of Malaria Consortium's Clover project to help strengthen health systems

The project also implemented a number of innovative approaches to increase malaria awareness and behaviour change, with a focus on school children and teachers. This helped build Malaria Consortium's reputation as an expert in behaviour change communication. The programme quickly expanded to include the <u>Clover project</u> (Irish Aid) on health systems strengthening, using malaria as an entry point.

Advocacy also became key for the Mozambique programme, with Mobilising for Malaria (GlaxoSmithKline) and Voices for a Malaria-Free Future (Bill & Melinda Gates Foundation) both successfully building local capacity for advocacy directed to the national level.

The Mozambique office gradually moved towards more community-focused projects, with the implementation of <u>ICCM for pneumonia, diarrhoea</u> and malaria in young children (CIDA). Our main activities currently focus on the development of local capacity and the scaling-up of innovative and effective community health interventions.

Malaria Consortium Mozambique will continue to focus on improved monitoring and evaluation in all health work at various levels, including the introduction of digital systems, and on building capacity of government and local actors in all our projects.

We will also continue developing and testing innovative and effective approaches to improve communities' capacity to take ownership of health issues and ensure effective uptake of services are available. As an example, we are starting a project that will use <u>community dialogues</u> to improve knowledge, attitudes and uptake of mass drug administrations for neglected tropical diseases.

- Delivering over three million LLINs to pregnant women and achieving a 96 percent retention and use rate
- Training health workers in fever case management, including for severe malaria
- Conducting large-scale surveys (MIS 2007) and operational research around LLIN distribution systems, sustainability and durability
- Preparing policy documents for the Ministry of Health such as the National Malaria Control Strategic Plans (2005-2009 and 2010-2014), case management guidelines and LLIN policy
- Pioneering implementation of the new Ministry of Health community health worker programme
- Designing and producing innovative training packages and communication materials, including education through entertainment (edutainment)

Asia

Thailand, Myanmar and Laos/ Yunnan/Vietnam

In <u>Malaria Consortium Asia's</u> early years, much of our activities were intermittent and included longterm technical and institutional support to the Asian Collaborative Training Network for Malaria, which we helped to set up. We also worked with WHO on various surveys. Our regional office opened in 2007.

In 2008 we joined the Mekong Malaria Partnership. Our focus was on strategic information to support countries and partners in the Greater Mekong Subregion (GMS) to refine and improve their <u>control</u> <u>strategies</u> and to mobilise resources. This continues to be funded through a co-operative agreement with Centers for Disease Control and Prevention (CDC).

The regional programme has focused on the GMS, particularly Thailand, Cambodia and Myanmar, but including Laos PDR, Vietnam and Yunnan province in China. One of the key areas of the programme has been to strengthen monitoring, evaluation and surveillance activities for malaria affecting these areas.

The first of these was the <u>Containment Project</u> (Bill & Melinda Gates Foundation) to address growing resistance to anti-malaria drugs along the Thai-Cambodia border. The project focused on detecting and effectively treating all malaria cases in the target areas in order to reduce drug pressure from resistant parasites and contain transmission of malaria, especially among mobile and migrant populations who are the highest risk group.

Together with other partners including the Bureau of Vector-Borne Disease, Thailand and Cambodian national malaria control programme, we received funds from WHO as sub-recipients for this project to lead the monitoring and evaluation of the containment strategy. Currently, we are continuing to focus our work on the <u>containment of artemisinin resistant malaria</u> in Thailand with Global Fund support.

Cambodia

In Cambodia, under the Containment Project, we began with a focus on those populations most at risk of contracting malaria. The lessons learned from our support for the review of migrant workers and mobile populations in the GMS were essential in helping to inform policy for developing malaria programmes for these vulnerable populations in both Thailand and Cambodia.

We have also supported the national malaria programme in Cambodia in the development of a behaviour change communication strategy for malaria elimination and have fostered cross-border coordination between Cambodia, Thailand and Myanmar (UKaid/DFID).

One of the key highlights of Malaria Consortium's contribution in Cambodia has been the design, piloting, evaluation and scale up of a malaria information system that incorporates real-time malaria data for direct action through short message service (SMS) based technology. <u>Lessons learned</u> from using mobile communications technology in Cambodia have supported the strengthening of surveillance systems and have been used for other countries, including Myanmar.

Our <u>Beyond Garki</u> (UKaid/DFID) project is now monitoring changes in malaria epidemiology in the context of malaria elimination in Cambodia to strengthen the existing surveillance system.

Malaria Consortium Asia's integrated vector management project (UKaid/DFID) has been delivering behaviour change communication to improve the effective use of malaria interventions



▲ Migrant agricultural workers are particularly vulnerable to malaria and are a focus of many of our Asia activities

and other vector-borne diseases. We are also now working to identify the most appropriate diagnostic tools for the <u>management of pneumonia</u> (Bill & Melinda Gates Foundation) in Cambodia and we are undertaking further work on <u>dengue</u> (UKaid/DFID).

In the future

Malaria Consortium's Asia programme will continue to contribute to containment and elimination efforts and look for innovative approaches as the region moves towards malaria elimination. In <u>Myanmar</u>, we are exploring potential innovations to provide protection from mosquitoes for rubber tappers working outdoors at night time and piloting a testing, treatment and referral system in the private sector through <u>SMS technology</u> in Cambodia. Projects such as <u>IMMERSE</u> (CDC) will continue to strengthen monitoring, evaluation and surveillance activities in the GMS and will provide technical support and guidance to national programmes to develop methodologies and tools. Disease control: malaria and neglected tropical diseases

> A trained community health worker prepares medicine for children under the age of five to help protect them during the malaria season in Katsina state, Nigeria

Dr James Kananura Tibenderana Development director

We administered **500,000**

chemoprevention treatments to **176,000** children in northern Nigeria to prevent seasonal malaria





 Malaria Consortium is spearheading the adoption of continuous distribution of LLINs via schools and other community-based services in Ghana

CHWs trained through Malaria Consortium's ICCM projects, carried out over

6 million treatments for pneumonia, diarrhoea and malaria*

*2.2 million ICCM CIDA and 3.9 million UNICEF ICCM Central (Uganda)

Disease control: malaria and neglected tropical diseases

Technical excellence has been a core value of Malaria Consortium right from the outset.

With origins from the London School of Hygiene & Tropical Medicine and the Liverpool School of Tropical Medicine, it is no surprise that the organisation chose its niche as a technical international non-governmental organisation in malaria control. Underpinning our technical approaches and learning is programme implementation. By implementing in a variety of settings: different geographical locations, different malaria transmission settings and different health systems, we are able to use our experiences to cross learn and to innovate. Our footprint in Africa has included Ethiopia, Ghana, Mozambique, Nigeria, South Sudan, Uganda and Zambia, while in Southeast Asia, we are based in Cambodia, Myanmar and Thailand, but have also worked in Lao PDR, Vietnam and China.

In choosing where we work we consider the public health problem due to malaria, the value that we bring to the country, the willingness of national governments to collaborate with us and the funding that we are able to mobilise for our work. Whatever the setting or circumstance our motivation is to reduce the suffering that malaria inflicts on the vulnerable and the less privileged. To achieve this impact, part of our programme logic is that high, sustained and complementary coverage with proven malaria control interventions along a continuum of care, will bring about the systematic changes needed for short, mid and long term benefits. This is a dynamic process and to maintain optimal effects requires an excellent understanding of malaria epidemiology, information on the changing pattern of the burden of disease and community behaviour. By embedding research into implementation and by strengthening the institutional and human capacity to generate and use evidence, we are working to see that the gains we make are sustained.

Shaping the landscape: learning, innovating and adapting

Malaria Consortium demonstrated in Uganda that community case management for malaria was feasible and contributed to the design, acceptance and use of unit-dosed pre-packs of anti-malarials. Whereas this involved presumptive treatment of malaria in areas where the disease was endemic, our work in the introduction of rapid diagnostic tests for malaria¹⁻², and working with in-country Roll Back Malaria partners led to the change in national policy in Uganda to universal parasite-based diagnosis for malaria.³⁻⁶

Building on the community-based service delivery platform our work on integrated community case management of malaria, pneumonia and diarrhoea was a logical progression. We have shown in four countries, namely Mozambique, South Sudan, Uganda and Zambia, that community health workers can dispense artemisinin-based combination therapy (ACTs), antibiotics and oral rehydration salts according to national guidelines and, except in South Sudan where it is not yet policy, can safely use rapid diagnostic tests. Through this strategy, our training of and support for community-based health workers resulted in more than six million cases of pneumonia, diarrhoea and malaria being treated at community level by the end of 2013. Cognisant of the role that community health workers play in extending the health system beyond facilities, we are pioneering work on improving their <u>motivation and supervision</u> in Uganda and Mozambique, while in Cambodia, Ethiopia, South Sudan and Uganda, we are testing new <u>diagnostic tools</u> for pneumonia which they can use.

Insecticide treated nets are now of the long lasting kind. Gone are the days when communities had to treat their nets with insecticide. Malaria Consortium contributed evidence from experiences in distribution and use of nets through the public and private sectors.7-12 NetCALC13 and the operational understanding of the useful life and durability of long lasting insecticidal nets (LLINs) are some examples. In Nigeria and Ghana, we have contributed immensely to the adoption of continuous distribution of LLINs through innovative channels such as schools and community-based structures. The policy shift to ACTs required a concerted effort from a variety of stakeholders lead by the World Health Organization. In Uganda, Ghana and Nigeria our operational research and implementation has facilitated the policy change process and in so doing helped to save those lives that would have been lost from ineffective use of chloroquine-based combinations.14

"Whatever the setting or circumstance our motivation is to reduce the suffering that malaria inflicts on the vulnerable and the less privileged"

In Southeast Asia, we are involved in the containment of artemisinin resistance to protect the most effective anti-malarial we have at present. This has involved participating in the development and implementation of novel strategies including village based surveillance systems using SMS technology to capture malaria case data in real time, the promotion of crossborder collaboration, and national household and malaria indicator surveys to measure the impact of interventions over time. A particular focus on the role of migrant and mobile populations in the spread of resistance has necessitated the use of novel survey methodologies such as respondent driven sampling and has included innovative behaviour change communication strategies such as positive deviance to motivate and mobilise communities in the fight against resistant malaria.

From malaria, we have extended systematically and strategically into the control of other communicable diseases such as neglected tropical diseases, where our research skills and expertise in community-based delivery of integrated services have enabled this extension. In South Sudan we carried out integrated mapping of lymphatic filariasis, schistosomiasis and soil-transmitted helminths¹⁵ as well as mapping of trachoma.¹⁶ The mapping findings were used to inform the national control and elimination strategies for these diseases, and initial rounds of mass drug administration were conducted in high-burden areas. In response to the high prevalence of malnutrition in the country, we pioneered nutritional rehabilitation of severe acute malnutrition as a component of our ICCM model in South Sudan, which has since been adopted by other partners.

Health systems underpin the delivery of services. Most of our work tends to be embedded into existing health systems and this forms part of our approach to programme and impact sustainability. Our approach in using <u>malaria as an entry point</u> for health system strengthening was developed through seven years of work at sub-national level in Ethiopia, Mozambique, Tanzania/Zanzibar, Uganda and Zambia, in which the programme was directly responsible for changes to seven national polices, beneficial effects on the stability of essential drug supplies, quality of malaria diagnosis, health worker treatment practices, health information management, planning and budgeting.¹⁷

Looking ahead

In Uganda we have had the fortunate opportunity to create a demonstration project which illustrates the value the organisation brings to malaria control now and looking ahead. Over the past few years we have made concerted efforts to overlap our malaria programming and extensively monitor the effects on <u>malaria epidemiology</u>. The aspiration is to reduce malaria transmission intensity over time and, in the process, learn what works.

The infographic opposite illustrates trends over time, showing both the increase in insecticide treated net use and the proportion of slide positive cases among children aged under five years. Whereas we cannot say this relationship is a causal one, it demonstrates the utility of sustained and complementary programming over time and results measurement. Programme managers, as they strive for malaria elimination, are going to be faced with a variety of decisions regarding the most cost-effective package of interventions to deploy at what point in the transition from control to pre-elimination and how to maintain the gains made. Malaria Consortium will be an instrumental partner in this learning process. Our presence in Southeast Asia, where pre-elimination is a target within the next 10 years, provides a cross continent experience sharing opportunity with sub-Saharan Africa.

The role of seasonal malaria chemoprevention in West Africa as a part of an integrated malaria control package in areas with seasonal malaria transmission needs to be understood. Involving the private sector in malaria control and health systems strengthening, particularly as improved universal access to parasite-based diagnosis, causes the approach to fever management to include case management of non-malaria febrile illnesses such as pneumonia. The approaches to health worker performance management, the role of electronic systems for information and logistics management, understanding what promotes community acceptance and continued use of proven malaria interventions and looking at innovations in sustainable financing are key areas we shall be focusing on over the next decade.

Conclusion

Malaria Consortium has contributed to the changing landscape of malaria control. Our work would not be possible without the commitment and efforts of our staff, the support and stewardship of national governments, the funding from our development partners, the efforts of organisations and institutions we collaborate with and the cooperation of our beneficiaries. Over the next decade, there will be more changes. We shall continue to innovate and share our learning. Our technical excellence will remain a core value.

In focus

This infographic demonstrates trends over time, showing an increase in insecticide treated net use and a decrease in cases of malaria and anaemia in young children. It covers a three year period during which a range of malaria prevention and treatment interventions occurred, including those managed by Malaria Consortium*

Central 2 region, 2009

Figures for Central 2 region – shown in brown - relate to 8 districts (including what is now Kvankwanzi) and were recorded in November-December 2009**

• Kyankwanzi, 2012

Figures for Kyankwanzi district (part of Central 2 region in 2009) - shown in white - relate to 1 site and were recorded in September-October 2012 as part of the Beyond Garki project***

67.8% 2012 23.5% 2009

△ Percentage of households with at least 1 ITN (insecticide-treated net)



△ Percentage of children under 5 who slept under an ITN the previous night



△ Percentage of children under 5 positive with malaria

36.5% 16.6% 2009 2012

△ Percentage of children under 5 with moderate anaemia



UGANDA

∧ Percentage of children under 5 with severe anaemia

*Malaria Consortium ICCM-CIDA and Pioneer projects. **Uganda Bureau of Statistics (UBOS) and ICF Macro. 2010. Uganda Malaria Indicator Survey 2009. Calverton, Maryland, USA: UBOS and ICF Macro. ***Malaria Consortium. Beyond Garki project, Kyankwanzi. Unpublished data.

Case study

Community based net distribution



△ A community member exchanges her net voucher for nets at a distribution point in Lainya County, South Sudan

Lainya County, South Sudan

To strengthen malaria prevention and control interventions in South Sudan, Malaria Consortium used funding from UKaid/DFID to test whether universal coverage of long lasting insecticidal nets (LLINs) can be maintained through a <u>community-based continuous</u> <u>distribution network</u> in Lainya County.

This approach has been piloted in partnership with the Republic of South Sudan Ministry of Health and USAID's NetWorks project, of which Malaria Consortium is an implementing partner.

Lainya County has a population of over 240,000, with around 35,000 households, and suffers a high malaria burden all the year round. The aim of the project was to provide a sustainable method of replacing LLINs in households where they may have been damaged, destroyed or are simply insufficient.

A good understanding of the contextual environment in South Sudan was essential in support of implementation activities, ensuring the pilot was designed to be flexible and allowing strategies to be adaptable. Involving and engaging different community groups such as health workers, clergymen, women's groups, village health committees and other community groups meant stakeholder feedback was incorporated into on-going implementation. "As a church leader I was involved, even in the planning of this programme," said Reverend Rufus Lemi, dean of the cathedral for the diocese of Lainya, Episcopal Church of South Sudan. "Key people in the county were called when the programme began, so it could be introduced to them. Ideas were sought on how best they thought this programme could succeed. The church has a key role in disseminating information to people. More than 80 percent of the population in Lainya is a member of the Episcopal Church of South Sudan congregation."

In order to ensure the pilot had enough LLINs for every household, Malaria Consortium and partners procured 50,000 nets. The nets were kept in the community, in storage units established in primary health care centres, including remote rural areas. The pilot used a 'pull system' to ensure storage facilities never ran out of stock, with community members receiving and redeeming net coupons from community level health workers.

The most commonly cited challenge faced by community members were the long distances between communities and storage facilities. Malaria Consortium responded by opening five new facilities and allowing relatives and neighbours of net coupon recipients to redeem coupons on their behalf. In one location, a storekeeper responded by taking one bale of LLINs to a distant village each Saturday so that people in that area could redeem their coupons.

Community mobilisation and participation are also key requirements for the success of any communitybased continuous distribution system. Frequent messages were communicated on the eligibility criteria for receiving nets to help with effective distribution. Behaviour change messages (BCC) were tailored to reach various population groups using different channels of communications. Social mobilisers sent out SMS messages, designed by Malaria Consortium's regional BCC specialist, to provide information to the community. Messages on dates and times for net coupon redemption were also shared by social mobilisers at churches and markets on a weekly basis.

A priority for the success of the pilot was to encourage willingness among local leaders to engage in community level monitoring, ensuring the sustainability of continuous distribution mechanisms within the community beyond the life of the pilot.

"You must first engage key people so that they will then go on to monitor the programme," said Lona Keji, a community development officer and mobiliser from the area. "They must be sensitised about the importance of the programme so that they can monitor if the nets are really used. This is important, so that people don't collect the nets and misuse them. I used to go to the *payams* and see children playing outside after 9pm. But now at 6pm people are inside. They are now using nets and this is evidence that the project is working."

Distribution began in May 2012 in all five *payams* in Lainya County, including through established antenatal clinics. Over 11 months, more than 30,000 net coupons were issued to communities. Some 94 percent of these were redeemed, reaching an equivalent of around 11 percent of the population.

"Health personnel working in health facilities were trained by the project to distribute nets and, before distribution, messages were shared about health education so that people understand the importance – to change their behaviour," explained Christine Amude, county health department storekeeper. "Net coupon holders also received training. There were follow-up visits to see whether and how the nets are being used. Because people know someone will come to check, this has helped the project succeed. Previously we only received nets from different NGOs and the Ministry of Health for children under five and pregnant women. But with this project the nets are for all and this has made the community very happy." In a country like South Sudan, where populations are widely dispersed in rural areas, bringing nets closer to the community is crucial to keeping up coverage. Community-based channels present an effective means of ensuring that, where mass campaigns have not reached communities, people can still access nets on a continuous basis.

Malaria Consortium worked with all levels of the Ministry of Health, including the National Malaria Control Programme (NMCP), the State Ministry of Health and County Health Department to plan the pilot and to prepare for its sustainability. International NGOs and other agencies working in the health sector in South Sudan were also consulted during the design. Linkages and partnerships forged between all partners provided the foundation for key results. In support of efforts to influence policy on malaria prevention, Malaria Consortium remains an active participant in the NMCP Malaria Programme Review and Malaria Technical Working Group.

"Sustaining a programme without funding is very difficult," said one community member. "What will help sustain it is continuous sensitisation. Also in health centres, if community health workers could ask people who return repeatedly with malaria if they are still using the nets, this would help. If we do not make use of people who are already under the government payroll, it will be difficult to sustain."

"Key people in the county were called when the programme began, so it could be introduced to them. Ideas were sought on how best they thought this programme could succeed" *Reverend Rufus Lemi*

Linking the community to health systems

Helen Counihan Senior public health specialist, community systems

Dr Karin Källander Senior research advisor

6,630 children under five with signs of severe malaria were given a fast acting treatment by CHWs before being urgently referred to a health facility

Community health workers in Mozambique ensure the continuum of care between the community and the health facilities





▲ A community health worker in Mozambique uses his phone to follow procedure for assessing a child patient. Here he is responding to a question on chest indrawing as a sign of severe pneumonia

Linking the community to health systems

One of the common challenges for health services in many malariaendemic countries is the unequal geographic distribution of resources and health workforces, resulting in difficulties in sustaining quality care at the peripheral and community levels.

As a consequence, health system strengthening has been a core principle for Malaria Consortium since it was founded in 2003. During our first seven years, we had the opportunity to implement a programme in four African countries (Ethiopia, Mozambique, Uganda and Zambia) which used malaria as an entry point to strengthen health systems. This programme strengthened the delivery and quality of malaria care through many different interventions such as capacity building of health staff at district and health facility levels in supply chain management and supporting the establishment of external quality assurance systems for malaria diagnosis. We have built on this experience through subsequent programmes including our support to the national malaria control programmes in Nigeria and in countries of the Greater Mekong Subregion in Asia.

Extending the continuum of care from the health system to community level has also been a long standing focus, initially through implementation of home management of malaria provided by community health workers. More recently, this developed into implementation and support for integrated community case management (ICCM) whereby community health workers provide access to lifesaving care to children with malaria, pneumonia and diarrhoea – principally in Mozambique, South Sudan, Uganda and Zambia.

What we have learnt

Enabling all communities to benefit from accessible quality health care requires a strong and wellfunctioning health system that has the capacity to reach the most remote areas. The formal health system can be complemented by programmes delivering health care through trained community members, but it is vital to have full support and involvement of both health facilities and communities for this approach to succeed. Malaria Consortium's approach has been to first provide refresher training to health workers before involving them as trainers and supervisors of community health workers, creating a strong link between the community and health facility from the start.

In managing cases of malaria and other infections, the development of resistance to widely used medicines means the need to treat only confirmed cases has become critical. Microscopy for malaria diagnosis requires robust quality assurance, which our work in countries such as <u>Ethiopia</u> has shown can be feasibly and effectively implemented if thoughtfully integrated into existing activities. The arrival of malaria rapid diagnostic tests (RDTs) has been revolutionary, as they bring the capacity to diagnose malaria outside the laboratory. Our implementation research provided evidence on the feasibility and acceptability of RDTs' use in health facilities in <u>Uganda</u>, as well as their safety, accuracy and acceptability when used by community health workers in Uganda and Zambia. Our ground-breaking work on the introduction of RDTs in health facilities and at community level in Uganda provided evidence which was a vital catalyst for the development of a national policy on their use. In partnership with the Zambian National Malaria Control Centre, the <u>evidence</u> collected informed the inclusion of RDTs within home management of malaria.

With the introduction of RDTs, the management of non-malaria febrile illnesses becomes more pertinent. Recognising the natural progression from home management of malaria to ICCM to include the other major childhood illnesses, our work pioneering this strategy at large scale is informing and guiding global and national policies, both for the public sector for diagnosis and more broadly for the private sector.

Building on the ICCM training in identifying nonmalaria cases, we invested in tools and training, improving diagnosis for another common childhood disease, pneumonia: from beads on a string for low literate community health workers in South Sudan to mobile phone apps for use at community level in <u>Uganda and Mozambique</u>. Our work in this area

"The formal health system can be complemented by programmes delivering health care through trained community members, but it is vital to have full support and involvement of both health facilities and communities for this approach to succeed" paved the way for an exciting new study in four countries in Africa and Asia which identifies and evaluates new diagnostic tools for symptoms of pneumonia and hypoxaemia for community health workers and first level health facility workers.

An essential element of our work at community level is behaviour change communication to create awareness and increase usage of community-based health services among the target populations and to strengthen their capacity to manage their own health and make informed decisions.

Our rigorous formative research for a multi-country ICCM project showed that community health worker retention and quality of care are largely driven by motivation and performance. Innovations in the use of mobile communications technology for health (<u>mHealth</u>) and community engagement designed to increase community health workers' status and enable regular contact with supervisors and fellow community members, are being tested for their impact on community health worker performance.

Another innovation is using mobile phones for malaria surveillance, an excellent example of which can be found in our work in <u>Cambodia</u>. Here village malaria workers and health facility staff report, via short message service (SMS), to a central information unit each case of confirmed malaria. This state-ofthe-art surveillance system is already in place for the detection of febrile malaria cases. Such a surveillance system offers a unique and inexpensive opportunity to evaluate the potential impact of active detection and treatment at the household level.



A community health volunteer with low literacy uses beads to count breaths to assess for pneumonia in a young patient in Aweil province, South Sudan

Over

4.000

CHWs

trained in integrated community case management across four countries*

*Mozambique, South Sudan, Uganda, Zambia

Looking ahead

A key priority area for Malaria Consortium in the future is the building of an evidence base to maximise the benefits of community based health services:

- The integration of community based care across illness conditions, including the delivery of care for mothers and newborns, malnutrition and neglected tropical diseases within existing CHW programmes, will be explored further.
- The integration of health system functions at different levels, including methods for collection and incorporation of community data in national health information systems, for more effective planning and supervision. This could potentially use mHealth tools for real time reporting.
- The creation of sustainable collaborations between the public and private sectors at different levels of the health system, to increase the reach of high quality and accountable health services in the community.

An overarching theme for success of any community based health delivery system is local ownership and local accountability for all associated problems, solutions and innovations. A continuing priority for the organisation will therefore be technical support to governments in the countries where we work through sharing evidence and learning from our programmatic experiences, participating in policy dialogues, and providing input for the establishment of structures that can strengthen the health systems in the long term.

Global health related goals can only be achieved if the health system is extended to reach people most at risk of illness and death from disease: young, poor and rural populations in resource poor countries.

With local ownership, accountability and stewardship by the government, a strong integrated community health service linking public and private sectors can form a permanent component of the health system. Information and communications technology solutions and new diagnostics can help community-level providers to improve their services. With advances in the health system and epidemiological transitions, the functions of community health care delivery systems should be revisited and adapted accordingly, with a long-term goal of shifting the focus from service provision to surveillance and mobilisation.

Case study

Building trust and a healthy community

Beatrice, a community health worker, received training from Malaria Consortium to be able to assess and treat children under five for pneumonia and diarrhoea, as well as malaria



Kisongi village, Uganda

When a child dies, it's a tragedy. When that death could have been avoided, the tragedy is even more devastating.

Sadly, this scenario is all too common for health workers trained to provide integrated community case management (ICCM) across Uganda.

"In my early days as a village health team member (VHT) people didn't have any trust in my skills," explained <u>Katusabe Beatrice</u>, a community health worker (known as VHTs in Uganda) in Kisongi village in the remote district of Buliisa. "For example, if I would test a child for malaria and the outcome was negative, their conclusion would be that I didn't know what I was doing." Malaria is so common in Uganda that any fever is thought to be malaria and, rather than seeking accurate testing and treatment, people tend to self-medicate.

"I was visited by a mother, Tibangwa Sarah, whose daughter had a severe fever. The malaria rapid diagnostic test was negative, so I wrote her a referral to the health centre for more tests. Instead, because she didn't trust me, she went to the drug shop, bought the wrong drugs and the child died."

Sarah herself, as painful as the realisation must have been, has since admitted she could have saved her child's life by listening to Beatrice's advice. "Shortly after it happened, I met Sarah at the borehole," said Beatrice. "After I had expressed my condolences, Sarah admitted that it was out of ignorance she didn't follow my advice. I would feel so frustrated back then. We knew we could help but we needed people to trust us and that is when the village health club came and rescued us." Today, the rumour being spread about Beatrice is that she knows what she is doing and is the person you should go see if your child is sick. The reason behind this life-saving shift in opinion is the recently formed village health club, organised by Beatrice and her colleague Birungi Tabu through Malaria Consortium's <u>inSCALE project</u>, funded by the Bill & Melinda Gates Foundation.

"The challenge of distrust no longer exists for us", Beatrice explained. "The village health club has helped us sensitise the community, to teach them that not every fever is malaria, there are other illnesses too. People now understand that the rapid diagnostic tests are for malaria only, so if the test is negative, they use the referral note to get the proper treatment. Everyone in our community knows Tibangwa Sarah's story, so I used it as an example in one of our meetings. I told them that this is what can happen so that they could understand the consequences."

The village health club, though, didn't change things overnight. "The interest wasn't that big in the beginning," explained Beatrice. "The format we were taught during the training didn't seem to work for our community; very few people would come for the meetings. They found it boring and demoralising. So we sat down and thought what we could do differently to get people involved." The result was introducing drama, song and dance as a way of imparting knowledge and educating about prevention and treatment of common childhood diseases.

"The village health club has helped us teach the community that not every fever is malaria – there are other illnesses too" *Katusabe Beatrice* "People used to dislike sleeping under mosquito nets because it is so hot here. So we developed a drama showing how the mosquitoes bite mostly at night and how that leads to malaria, and people started sleeping under nets. People started attending the meetings. They would cheer and enjoy and join up as members."

Today, the club has 24 members – mostly women – and its success is having a great impact on the women's patient load, with Beatrice now seeing at least 10 patients per week, while before it would be one or two, sometimes none at all.

"In the past, you would find me on my bicycle, carrying three children to the health centre at the same time," Bahoire Oliver, the club's chairperson, joins in. "Things were not good in my home. I have eight children, but didn't have a latrine, so there was a lot of vomiting and diarrhoea. Beatrice knew of my problems and encouraged me to join the club, through which I was inspired to build a latrine. Now there is no more diarrhoea."

Voicing the sentiments of all the women gathered, one club member said: "I thank God that my children are now okay."

Asked whether these clubs will have a future without the continued support of projects such as inSCALE, Dr Mirimo Godfrey, District Health Educator for Buliisa sub-county, believes they will, once people start seeing the benefits.

"I am very impressed with the Kisongi village health club," he added, which Beatrice and Tabu have now registered as a formal community based organisation. "As a community based organisation they will have access to local government funds, so that will really help sustain them. Also, the government is reliant on CBOs to disseminate messages, so it really works both ways."



*Nigeria: 9.8 million directly (through campaign and continuous distribution including commercial sector) and supporting the distribution of a further 53.2 million Mozambique: 230,000 directly and supporting the distribution of a further 1.5 million



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< "The results are clear: day-by-day resistance is undeniably growing. Artemisinin is quickly losing its ability to work here. The dangers associated with this emerging resistance can't be overstated. The numbers behind me are the data of individuals who have had resistant malaria"

Dr. Rupam Tripra, Research Physician, Mahidol-Oxford Tropical Medical Research Unit

From the

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Moving to elimination

Malaria Consortium's engagement with work to eliminate malaria, in Asia in particular, has been driven by three major themes.

These are:

- To push for *Plasmodium falciparum* elimination as quickly as possible in areas of artemisinin resistance
- To establish much better surveillance systems and capacity to provide the detailed timely information needed for elimination
- To advocate for continued high quality, highly intense efforts against malaria even when the burden declines

There are two schools of thought on how you would achieve global malaria eradication – one is that you start at the edges, where there is very little malaria, and progress later to the centre, where transmission is more intense. The other is that you start your efforts everywhere because, if you wait until you have done the edges of the global malaria map before you start in the centre, the central core is still ready to re-invade the areas where you have already eliminated. Malaria Consortium supports the second view and is looking at how lessons from practical elimination in Asia can be introduced in parts of Africa.

We currently have some very good tools to control malaria including effective drugs for treatment and insecticides for nets, but both of these tools are under threat from drug and insecticide resistance. Currently, we are not sure how long it will take to find an acceptable future generation of tools. It is critical that we move forward as strongly and quickly as possible to bring malaria down, while current tools last.

Elimination and resistance

In parts of Southeast Asia, the prospects for elimination in the short term are greater than in much of Africa, as malaria prevalence is lower. However, the presence of artemisinin resistance in the region could lead to failure unless efforts to eliminate and control the spread of resistance continue and are scaled up as a matter of urgency.

Huge strides have been made in driving malaria down in the parts of Cambodia and Thailand where resistance was first detected through the <u>containment</u> <u>efforts</u>, which took off in 2009 after intensive planning. A Joint Assessment of the Response to Artemisinin Resistance in 2012 recognised the progress, but called for an increased urgency in the response, and WHO launched its Emergency Response to Artemisinin Resistance. Most recently, there has been an increase in political engagement with the creation of the Asia Pacific Leaders' Malaria Alliance.

In the <u>Greater Mekong Subregion</u>, Malaria Consortium's work has focused on trying to support strategies for rapid elimination in areas where there are high levels of artemisinin resistance. This has been primarily through surveillance, monitoring, evaluation and implementation research as well as behaviour change communications and advocacy. We are moving towards more targeted programmes, which require robust and up-to-date local data.

"The presence of artemisinin resistance in the region could lead to failure unless efforts to eliminate and control the spread of resistance continue and are scaled up as a matter of urgency" There is much still to learn about low level malaria transmission in Southeast Asia. For instance, why is there so much low level asymptomatic parasitaemia in people who are unlikely to have much acquired immunity? We also need to know more about the importance and the behaviour of potential secondary vectors in habitats where malaria is still occurring. It is important to understand which intervention approaches can work, but it is difficult to undertake randomised controlled trials of new and existing interventions because of the low number of cases.

One approach, which Malaria Consortium is pursuing through our multi-country project, Beyond Garki, is to undertake long term small area intensive monitoring. This is allowing us to develop a comprehensive picture of all potential causative elements, which can help to interpret and attribute changes we see in transmission. Through the project, which is running in Cambodia, Ethiopia, Nigeria and Uganda, we are monitoring medium and long term changes in the epidemiology of malaria within the context of implementation of interventions and assessing necessary conditions to reduce transmission below its critical level. We can then make recommendations that adapt prevention and control measures to observed changes. In Pailin province (Cambodia) it also aims to assess conditions towards malaria pre-elimination and elimination goals. This will help to develop recommendations on an appropriate response system in pre-elimination settings by strengthening the existing health surveillance system and tailoring appropriate responses specific to elimination strategies for both P.falciparum and P.vivax malaria.

Vector resistance against insecticides used in malaria control is an additional major threat to elimination. Malaria Consortium has been involved in insecticide resistance monitoring studies in a number of districts in Uganda since 2009. Results of some of these studies have led to changes in insecticide policy and use of indoor residual spraying.

Improving surveillance and using mHealth for malaria elimination

Through efforts to develop better surveillance using innovative tools in Cambodia, we have learnt some useful lessons:

- 1. If a system does not work manually, technology is unlikely to help
- 2. Use existing sources of data as much as possible, and add only to the data collection work of health workers if absolutely necessary
- 3. Keep it simple; smaller systems may be better than a single big system
- 4. Decentralise the surveillance system to a level where decisions are made
- 5. Monitoring and evaluation and sufficient refresher training are needed
- 6. Try to make the mHealth systems free for the users by working with the telecoms companies

More details can be found in our recent learning paper <u>Moving towards malaria elimination:</u> <u>developing innovative tools for malaria surveillance</u> <u>in Cambodia.</u>

Elimination will require seeking out every case, and this has been a major challenge in the private sector. Our SMS Project in Pailin and Battambang, supported by UKaid/DFID, aims to improve referrals and integrate private patient data into the National Malaria Information System in <u>Cambodia</u> by piloting a short message service (SMS) technology in the private sector. It plans to design and test an innovative SMS alert system in Pailin Province and Battambang Operational District, and to identify bottlenecks and challenges that could affect the effectiveness of a full scale-up of this referral system. Another project we have been working on is the Innovative Malaria Monitoring and Evaluation, Research and Surveillance towards Elimination (<u>IMMERSE</u>) project. Supported by USAID/PMI/CDC, this five-year project is continuing to strengthen monitoring, evaluation and surveillance activities in the Greater Mekong Sub-region by providing technical support and guidance to national programmes, to develop methodologies and tools and also to test and evaluate innovative methods to guide transition from malaria control to pre-elimination and elimination in resistance containment and low transmission settings.

Looking ahead

Malaria Consortium's priority is to support the elimination of malaria. This involves:

- Improving implementation based on targeted operational research
- Delivering enhanced surveillance of malaria and promote active response to data
- Supporting and enabling technical developments through field testing new diagnostic and mHealth technologies at the national and community levels
- Focusing more on insecticide resistance management strategies in Africa
- Exploring options to eliminate other neglected tropical diseases in coordination with malaria elimination

Despite resistance, malaria elimination in Southeast Asia is still feasible, if time is not lost, investment is steady, information is accurate, timely and shared, strategies are tested and sound, everybody is committed (this needs constant advocacy), and there is fast-track elimination in areas with artemisinin resistance.

Many of the strategies can be introduced and adapted in parts of Africa, when the time is right, but investments in strengthening systems and surveillance will be a major benefit to programmes at all levels of transmission.

Over **6.6 million** ACTs distributed

through health service delivery points in Nigeria*

*Artemisinin combination therapy anti-malaria drugs. ACTs distributed via public and private health facilities – SuNMaP: 1,237,712; MAPS: 3,184,730. Via retail outlets – MAPS: 2,258,216 A child provides a fingerprick blood sample as part of Malaria Consortium's malaria surveillance work through schools, in Southern Nations, Ethiopia



Case study

Targeting at-risk migrant populations



 Malaria Consortium and partners set up a border crossing (Cambodia-Thailand) malaria screening checkpoint, targeting hardto-reach migrant workers

Cambodia-Thailand border

Cambodian farmer, Cheun Seun, frequently crosses the border into Thailand to look for work.

His journey is uneventful, save for a single stop at the border. "I cross this border every day," he said. "I live in Cambodia and look for work in Thailand and in the evening I come back to Cambodia."

Here, beneath a trilingual banner bearing the name of Malaria Consortium and its partners, he is approached by a worker wearing a bright green jersey and a cap. But rather than handing over his passport, Cheun Seun is asked if he would be willing to be tested for malaria. This is because he is one of the many migrant workers whose journey takes him through one of the world's hot spots for artemisinin resistant malaria – a resistance that is threatening to reverse years of progress.

The location of the border checkpoint has been strategically chosen to help contain the spread of this parasite resistance to artemisinin, currently the most effective drug used to treat malaria. Every working day, lab technicians like Thien Su Wit go to the checkpoint and perform tests on passers-by.

"Here at the border, with the cross-border Malaria Consortium team, we complete the consent forms so that people can take part in our screening, then I take the fingerprints," he explained. "We do rapid diagnostic tests first and dry blood spots second." The tests are used to determine whether any traces of the malaria parasite can be detected in the patient's blood. If the parasites are found, the patient is treated immediately. Drug resistance has the potential to greatly complicate efforts to fight malaria in endemic regions if it is allowed to spread. Experts fear that mobile and migrant workers are more at risk of spreading the resistant parasite to other regions because of their itinerant lifestyle.

"These people are really hard for us to reach," said Sophal Uth, who is a field coordinator for Malaria Consortium in Pailin, Cambodia. "Sometimes they just get one or two doses of malaria treatment and then they go away – they move to another place. This is our big concern, and right now we want to contain all the resistant parasites. We have to focus on these people, and make sure that we screen them as they cross the border and ensure they complete treatment. We don't want them to spread the resistant parasite from our country to a neighbouring country." Sophal and his colleagues are fully aware that were the parasite to spread to sub-Saharan Africa, where malaria is very common, the results could be devastating.

"I hope we end up with a situation where everyone understands about malaria and we can work together to eliminate it, as well as this resistant parasite" *Cheu Long* "The challenges are really for people who are mobile and migrant," said Cheu Long, a village malaria worker, who is currently working on the Cambodia-Thailand border. "They don't have information about where they can access health services and this is a big challenge for them. At first it was not easy, because people crossing the border here did not really understand the purpose of this – why we wanted to test them. We had to explain more about our work and why we are here and what we are trying to achieve. And why it is important to test people crossing the border."

But once people learn what the problem is, added Thien Su Wit, they are usually more than happy to take part in the process. "I have found that most people are happy to consent to this screening. On one day I will test 20-25 people and I think most of them understand about resistance."

In addition to preventing the spread of drug resistance, testing at the border has other benefits. Cheun Seun recalls that he has had malaria six times now. "I am not sure why it has happened again and again. Malaria makes things hard – sometimes I am working in the field and I get a fever. I have to rest." But with frequent diagnosis and treatment at the border and in the villages through village malaria workers, he is less likely to have further episodes of malaria and will be able to keep up his work.

<u>Projects like this</u> one are not only important for identifying and mapping cases, but also providing treatment and – importantly – information about malaria for at-risk mobile populations.

Cheu Long hopes that there is an end in sight. "I hope we end up with a situation where everyone understands about malaria and we can work together to eliminate it, as well as this resistant parasite."

Going forward

Over the 10 years that Malaria Consortium has been in operation, we have seen significant change. This change is evident in the investment made by governments and donors in their efforts to eliminate preventable death and disability caused by malaria and other diseases – more generally among some of the poorest and most vulnerable in our world, and also in the type and level of our contribution to that effort.



Charles Nelson Chief executive

By contributing, through operational research, technical assistance and implementation support to affected communities and their governments, we have built a reputation for technical excellence and supporting high quality, cost-effective, evidencebased health interventions that also strengthen the wider health system.

Our world continues to change, with significant progress in many areas. As a result, we find ourselves working in settings that reflect the spectrum of endemicities of malaria with highly varied circumstances of co-morbidity, health system investment and socio-economic development. We also see the worrying developments of resistance of the parasite to available treatments and of the mosquito to established insecticides. As life expectancy increases, so does the emergence of non-communicable disease in the communities that have, until now, had a health system focused on infectious disease control and safe maternity.

"We still have a substantial role to play in our mission to rid the world of some of the infectious diseases that impact most on those who can afford it least" So what does this mean for our priorities as we look ahead?

The fight against malaria is not over. Large parts of Africa need to maintain a focus on the consistent implementation of control measures that are proven to reduce the incidence of malaria. This is the only way we can achieve, as quickly as possible, the goal of zero deaths caused by this entirely preventable disease.

As the burden of malaria decreases in the move towards elimination, a number of factors come into play. The combination of different interventions must be tailored to the reality of the environment; focus on the most vulnerable and hardest to reach must be maintained; parasite-based diagnosis of malaria must become universal and institutionalised; surveillance systems need to develop to increase timeliness and accuracy of response; resistance markers of the falciparum parasite must be tracked; patterns of mosquito behaviour and resistance to insecticide must be monitored; and the use of technology-supported solutions must be scaled up.

In line with these factors is a need for increasingly sophisticated advocacy to ensure the impact of potential resurgence is not forgotten, while the priorities of the wider health system must be revisited. The risk of the development of resistance of the parasites to current treatments will ultimately only be removed when the parasite pool is no longer there.

Beyond malaria, we will support the roll out of interventions that will ensure that neglected tropical diseases are no longer neglected. We believe more of these can be completely eliminated in the foreseeable future. Research efforts need to continue to find suitable prevention and treatment alternatives for dengue fever, which, given the lack of current options, is fast becoming a greater contributor to morbidity for some communities than malaria. From a broader health perspective, diagnostic tools and protocols must be further developed to support clinicians and health workers to recognise and know how to respond when a fever is not malaria. This and the next generation of clinicians need to be able to benefit from updated training to ensure approaches remain current and appropriate.

All interventions need to become part of the wider health system and aligned with other efforts to reduce and eliminate disease. If it is to be sustainable, it is essential that community-based activity becomes a recognised and facilitated component of the wider approach to health care delivery, and the role of the community worker, both in the breadth and the depth of engagement in each setting, should be acknowledged and formalised. Cost effectiveness and sustainability must remain as drivers of intervention and programme design and the effective, appropriate engagement of the private sector must be leveraged.

With this publication we are celebrating <u>10 years of</u> <u>Malaria Consortium</u> as an independent organisation. However, we are clear that our work is not yet done. We still have a substantial role to play in our mission to rid the world of some of the infectious diseases that impact most on those who can afford it least.



▲ Health facility staff are trained under SuNMaP's capacity building programme to help them manage malaria more effectively



In 10 years we have performed more than

1 million diagnoses and treatments for malaria A community health worker uses a pictorial flipbook to facilitate discussions in Kitaleesa Village Health Club, Uganda

References

Disease control: malaria and neglected tropical diseases, pages 14-21

1. Mukanga, D., Tibenderana, J. K., Kiguli, J., Pariyo, G. W., Waiswa, P., Bajunirwe, F., Mutamba, B., Counihan, H., Ojiambo, G. & Kallander, K. 2010. *Community acceptability of use of rapid diagnostic tests for malaria by community health workers in Uganda*. Malaria Journal, 9, 203.

2. Mukanga, D., Babirye, R., Peterson, S., Pariyo, G. W., Ojiambo, G., Tibenderana, J. K., Nsubuga, P. & Kallander, K. 2011. <u>Can lay</u> community health workers be trained to use diagnostics to distinguish and treat malaria and pneumonia in children? Lessons from rural Uganda. Tropical Medicine & International Health, 16, 1234-42.

3. Nankabirwa, J., Zurovac, D., Njogu, J. N., Rwakimari, J. B., Counihan, H., Snow, R. W. & Tibenderana, J. K. 2009. <u>Malaria</u> <u>misdiagnosis in Uganda – implications for policy change</u>. Malaria Journal, 8, 66.

4. Kyabayinze, D. J., Tibenderana, J. K., Odong, G. W., Rwakimari, J. B. & Counihan, H. 2008. *Operational accuracy and comparative persistent antigenicity of HRP2 rapid diagnostic tests for Plasmodium falciparum malaria in a hyperendemic region of Uganda.* Malaria Journal, 7, 221.

5. Kyabayinze, D. J., Asiimwe, C., Nakanjako, D., Nabakooza, J., Counihan, H. & Tibenderana, J. K. 2010. <u>Use of RDTs to improve</u> <u>malaria diagnosis and fever case management at primary health care</u> <u>facilities in Uganda.</u> Malaria Journal, 9, 200.

6. Asiimwe, C., Kyabayinze, D. J., Kyalisiima, Z., Nabakooza, J., Bajabaite, M., Counihan, H. & Tibenderana, J. K. 2012. *Early* experiences on the feasibility, acceptability, and use of malaria rapid diagnostic tests at peripheral health centres in Uganda – insights into some barriers and facilitators. Implementation Science, 7, 5.

7. Kilian, A., Byamukama, W., Pigeon, O., Atieli, F., Duchon, S. & Phan, C. 2008. *Long-term field performance of a polyester-based long-lasting insecticidal mosquito net in rural Uganda*. Malaria Journal, 7, 49.

8. Kilian A., Wijayanandana W., Ssekitoleeko J., 2009. <u>Review of</u> <u>delivery strategies for insecticide treated mosquito nets – are we</u> <u>ready for the next phase of malaria control efforts?</u> TropIKA.net Journal

9. Kolaczinski, J. H., Kolaczinski, K., Kyabayinze, D., Strachan, D., Temperley, M., Wijayanandana, N. & Kilian, A. 2010. <u>Costs and effects</u> of two public sector delivery channels for long-lasting insecticidal nets in Uganda. Malaria Journal, 9, 102.

10. Kilian, A., Boulay, M., Koenker, H. & Lynch, M. 2010. <u>How</u> many mosquito nets are needed to achieve universal coverage? Recommendations for the quantification and allocation of long-lasting insecticidal nets for mass campaigns. Malaria Journal, 9, 330.

11. Kilian, A., Byamukama, W., Pigeon, O., Gimnig, J., Atieli, F., Koekemoer, I. & Protopopoff, N. 2011. *Evidence for a useful life of more than three years for a polyester-based long-lasting insecticidal mosquito net in Western Uganda.* Malaria Journal, 10, 299.

12. Batisso, E., Habte, T., Tesfaye, G., Getachew, D., Tekalegne, A., Kilian, A., Mpeka, B. & Lynch, C. 2012. <u>A stitch in time: a cross-sectional survey looking at long lasting insecticide-treated bed net ownership, utilization and attrition in SNNPR, Ethiopia.</u> Malaria Journal, 11, 183.

13. www.malariaconsortium.org/where-we-work/netcalc_predicting_ llin_net_needs.htm

 Zurovac, D., Tibenderana, J. K., Nankabirwa, J., Ssekitooleko, J., Njogu, J. N., Rwakimari, J. B., Meek, S., Talisuna, A. & Snow, R. W. 2008. <u>Malaria case-management under artemether-lumefantrine</u> treatment policy in Uganda. Malaria Journal, 7, 181.

15. Finn, T. P., Stewart, B. T., Reid, H. L., Petty, N., Sabasio, A., Oguttu, D., Lado, M., Brooker, S. J. & Kolaczinski, J. H. 2012. Integrated rapid mapping of neglected tropical diseases in three States of South Sudan: survey findings and treatment needs. PLOS ONE, 7, e52789.

Sturrock, H. J. W., Picon, D., Sabasio, A., Oguttu, D., Robinson, E., Lado, M., Rumunu, J., Brooker, S. & Kolaczinski, J. H. 2009. Integrated mapping of neglected tropical diseases: epidemiological findings and control implications for northern Bahr-el-Ghazal State. Southern Sudan. PLOS Neglected Tropical Diseases, 3, e537.

16. Kur, I. W., Picon, D., Adibo, O., Robinson, E., Sabasio, A., Edwards, T., Ndyaba, A., Rumunu, J., Lewis, K., Lado, M. & Kolaczinski, J. 2009. <u>Trachoma in Western Equatoria State, Southern</u> <u>Sudan: implications for national control.</u> PLOS Neglected Tropical Diseases, 3, e492.

Robinson, E., Kur, I. W., Ndyaba, A., Lado, M., Shafi, J., Kabare, E., Mcclelland, R. S. & Kolaczinski, J. H. 2010. <u>Trachoma rapid</u> assessments in Unity and Northern Bahr-el-Ghazal States, <u>Southern Sudan.</u> PLOS ONE, 5.

17. <u>The Clover Project: sustained funding for health systems</u> <u>strengthening critical for effective disease control</u> <u>www.malariaconsortium.org/news-centre/clover-health</u>



Malaria Consortium is delighted to be one of the founding members of the Roll Back Malaria Partnership, the global framework for coordinated action against malaria. **www.rollbackmalaria.org**

Malaria Consortium

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