

IMPROVING ACCESS FOR UNDER-FIVES TO LIFE SAVING TREATMENT THROUGH INTEGRATED COMMUNITY CASE MANAGEMENT FOR MALARIA, PNEUMONIA AND DIARRHOEA

MOZAMBIQUE, SOUTH SUDAN, UGANDA AND ZAMBIA
PROGRAMME COMPLETION REPORT

SUBMITTED TO CANADIAN INTERNATIONAL DEVELOPMENT AGENCY

July 2013



23 MARCH 2009 TO 31 MARCH 2013

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Grateful thanks is extended to all the ICCM country teams which have all shown high commitment for establishing this programme in their respective countries and fully engaged with the Ministry of Health and other stakeholders. Their efforts and contributions to this report have provided the main body of information included here.

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The collaboration and support of the Ministry of Health at all levels is also greatly appreciated and fully acknowledged.

Last but not least, sincere thanks to the men and women who are committed in implementing ICCM to improve the health of their own communities.

ACRONYMS AND ABBREVIATIONS

ACT	Artemisinin-based Combination Therapy
APE	Agente Polivalente Elementare (Mozambique)
ARI	Acute Respiratory Infection
BCC	Behaviour Change Communication
BMGF	Bill & Melinda Gates Foundation
CD	Community Dialogue
CDD	Community-based Drug Distributor (South Sudan)
C-HIMS	Community Health Information Management System
CIDA	Canadian International Development Agency
CHAZ	Churches Health Association of Zambia
CHD	County Health Department (South Sudan)
CHW	Community Health Worker
COMDIS-HSD	DFID-funded Research Programme Consortium
CSO	Central Statistics Office
DCM	Directorate of Curative Medicine (South Sudan)
DFID	UK Department for International Development
DHMT	District Health Management Team
DHS	Demographic and Health Survey
DPS	Provincial Health Directorate (Mozambique)
FGD	Focus Group Discussion
GMP	Good Manufacturing Practice
GOSS	Government of South Sudan
HBMF	Home Based Management of Fever
HMIS	Health Management Information System
HMM	Home Management of Malaria
ICCM	Integrated Community Case Management
IMCI	Integrated Management of Childhood Illnesses
inSCALE	Innovations at Scale for Community Access and Lasting Effect
IPA	International Procurement Agency
IRC	International Rescue Committee
ITN	Insecticide Treated Net
LiST	Lives Saved Tool
LLIN	Long-Lasting Insecticidal Net
MCDMCH	Ministry of Community Development Mother and Child Health (Zambia)
MIS	Malaria Indicator Survey
MoH	Ministry of Health
MoU	Memorandum of Understanding
M&E	Monitoring and Evaluation
NDA	National Drug Authority (Uganda)
NGO	Non-Governmental Organisation

NMCC	National Malaria Control Centre (Zambia)
NMCP	National Malaria Control Programme
NMFI	Non-malaria febrile illness
NMS	National Medical Stores (Uganda)
mRDT	Malaria Rapid Diagnostic Test
ORS	Oral Rehydration Solution
PHC	Primary Health Care
PPA	Programme Partnership Arrangement
PRA	Pharmaceutical Regulatory Authority (Zambia)
RED	Reach Every District (UNICEF Mozambique)
SIS	Sistema de Informação da Saúde (Mozambique)
ToT	Training of Trainers
UNICEF	United Nations Childrens Fund
VHT	Village Health Team (Uganda)
WHO	World Health Organisation

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EXECUTIVE SUMMARY

This is the final project report for the Canadian International Development Agency (CIDA) grant to Malaria Consortium for the project “**Improving access for under-fives to life saving treatment through integrated community case management for malaria, pneumonia and diarrhoea**”, which was implemented from March 2009 to March 2013. The **purpose** of this four year project has been to provide prompt and effective integrated community based case management (ICCM) of the major febrile childhood illnesses: pneumonia (acute respiratory infection), malaria, and diarrhoea in underserved rural areas of Uganda, Zambia, Mozambique, and South Sudan. ICCM was implemented by Community Health Workers (CHWs), who were supported and supervised by the formal health service to provide the service for children within their own communities. The **goal** was to contribute to a reduction in under-five mortality with a **target** of reducing all cause under-five mortality (post and peri-natal) up to 35 percent and to avert up to 30,000 child deaths.

Following a description of the project the report provides an update and progress report for the last reporting period 1 February 2012 to 31 March 2013 followed by a discussion of the progress and achievements of the programme overall. It then discusses key factors affecting progress, sustainability, lessons learnt during the programme, efforts in information dissemination and major conclusions from the results.

The major activities in the final year were the continued implementation of ICCM, the endline surveys and operational research. Behaviour change activities were also extensively rolled out except in South Sudan, where very poor security led to programme closure, as soon as the endline survey could be completed.

Some of the main conclusions reached, as this programme comes to an end, are as follows:

1. Once the trained and equipped community health workers were deployed, **uptake of their services was rapid and extensive** in all countries demonstrating the appropriateness of providing health services in this way. **Demand was readily created.**
2. ICCM does **contribute to increased coverage with diagnosis and treatment** for the three main childhood diseases, malaria, pneumonia and diarrhoea, as shown by the survey results. A **significant increase in timely treatment (within 24 hours)** was also recorded for fever and for cough and fast breathing in Uganda and Zambia, whilst in Mozambique and South Sudan there were increases, but endline levels were still low.
3. Initial assessment of the impact of ICCM on mortality using birth history data showed a **reduction in U5MR in Zambia from 127 to 100/ 1,000 live births and a reduction in IMR from 67 to 60. Uganda showed reductions but smaller**, and there were actually greater reductions in the comparator areas, whereas IMR in the Zambia comparator area increased. In South Sudan there was a reduction in U5MR from 55 to 40 post-intervention and 33 to 38 in the comparator area. We have looked closely at South Sudan data, as there were severe disruptions during the endline survey due to security, which may have affected quality. Further review of the mortality data is planned before conclusions are made on its interpretation. Our application of the **Lives Saved Tool (LiST) to model potential impact on U5MR showed some deaths averted** in all countries where it was applied.
4. It would be useful to undertake **further analysis** of the routine monitoring data and the survey data, as well as looking at other data sources from the national health management information systems in order **to deepen our understanding about who is reached by iCCM. Improvements in access** to high quality diagnosis and treatment can be measured by **not only the numbers of**

people using the service and the quality of that service, but also by the overall numbers of people reaching appropriate care from any source. This can be shown from the numbers seeking treatment from each source in surveys as well as reviewing patient load over all treatment sources – community, public facilities and private sector.

5. Whilst the **programme was overall highly successful, and more than 2 million treatments were provided by more than nine thousand trained community health workers (CHWs)**, much of the programme's real achievements occurred before diagnosis and treatment could begin. The **process of establishing the programme** and going through the steps of initial advocacy, supporting Ministries on policy development, production of appropriate training and behaviour change materials, ordering and distributing drugs and commodities **cannot be underestimated**, and must be done thoroughly but efficiently.
6. As a result of point 5, it is important to **be realistic about the time needed for such a community approach to become bedded in and ready for evaluation.** Whilst the programme has worked to measure impact at this stage, a more robust measure would need to be made once the programme was fully up and running for a minimum of 12 months.
7. **Evaluation of probability of impact attributable to the programme** is not straightforward when implementing a large-scale intervention within a national health service. While every effort was made to select comparator areas which were comparable at baseline to the intervention areas, it is not possible to control for all possible confounders. For this reason, significant changes in the comparator areas have not always been well understood.
8. The **training model** applied in the programme, in which we followed MOH guidelines and gave substantial technical inputs into curricula and tools including job aids, then used an adult, **participatory learning methodology worked well, but with further resources we would have wanted to undertake a more in-depth evaluation of the quality and outcome** of the training approach. Support supervision after training was highly appreciated, and was an opportunity for post training follow-up, although there were challenges in assuring individual supervision at the CHWs' homes.
9. The **behaviour change communication approach was seen as a real strength** of the programme. It involved formative research in each country followed by strategy development and community dialogues led by community leaders and CHWs. Lessons from this approach have been widely shared with in the international ICCM community.
10. A key element which was built into the approach was to ensure where possible that the **facilities responsible for supervising, supplying and receiving referrals from the CHWs also had necessary capacity building** and were included in communications. This led to a strong health system, that could support ICCM
11. **Sustainability** is critical to ensure the investments to date have useful returns. Our approach of **embedding most programme components within MOH processes and structures** has been an essential element of promoting sustainability. In addition, using other sources of funds, we have undertaken **substantial advocacy** to support resource mobilisation for continuity. This has been successful in Mozambique and South Sudan, but there are still major gaps in Uganda and Zambia. Work on **costing the intervention** is ongoing, and will be an important contribution to plans for sustainability.
12. Finally, while there are key core elements of ICCM, which are the same in every country, it is important that local **variations between and even within countries feed into a tailor-made approach that is adapted to local circumstances and needs.** An example is our addition of screening for severe and acute malnutrition in South Sudan to meet a need most appropriately met through the same mechanisms as ICCM. From this programme, we have many lessons from four very different contexts, which will continue to be shared through post-programme dissemination.

During the programme additional resources were sourced from other donors to undertake complementary activities to enhance programme performance. This included support to supplement operational research undertaken to address key questions arising on ICCM, support

from Bill & Melinda Gates Foundation to assess innovations to improve motivation and performance through village health clubs and mobile technology and support for post project dissemination of learning.

Results so far confirm the potential of ICCM to improve access to health care and to reduce mortality from common childhood illnesses. There is enough information to recommend further support of the approach, and Malaria Consortium continues to seek resources to support continuation until the programmes can be fully integrated into essential health care services. At the same time it will be important to review data from this and other projects to confirm that the impact achieved in this project is replicable elsewhere.

1 BASIC PROJECT INFORMATION

Table 1: Basic Project Information

Purchase Order No.	7052741
Organisation name	CANADIAN INTERNATIONAL DEVELOPMENT AGENCY (CIDA)
Project title	DIAGNOSTIC TREATMENT OF FEVERS
Project start and end dates	23 MARCH 2009 to 31 st MARCH 2013
Countries	MOZAMBIQUE, SOUTH SUDAN, UGANDA, ZAMBIA
Total funding provided by CIDA	CDN \$20,000,000

2 PROJECT DESCRIPTION

2.1. Original project design

The **purpose** of this four year project has been to provide prompt and effective integrated community based case management (ICCM) of the major febrile childhood illnesses: pneumonia (acute respiratory infection), malaria, and diarrhoea in underserved rural areas of Uganda, Zambia, Mozambique, and South Sudan. ICCM was implemented by CHWs who were supported and supervised by the formal health service to provide the service for children within their own communities. The **goal** was to contribute to a reduction in under-five mortality with a **target** of reducing all cause under-five mortality (post and peri-natal) up to 35 percent and to avert up to 30,000 child deaths.

2.1.1. Selection of countries

Criteria for selection of countries were in the grant agreement between Malaria Consortium and CIDA, which included:

- Countries where the project intervention areas have an under-five mortality rate greater than 120 deaths per 1,000 live births and the proportion of under-five deaths due to malaria and pneumonia are each greater than 15 percent
- Existing community based health worker presence in the intervention area
- Malaria Consortium presence in-country with required capacity to manage the work
- Supportive Ministry of Health (MoH)

Malaria Consortium used data from the World Health Organisation Statistical Information System to define the rural mortality rates from the countries where we already had a presence. Having identified countries with areas that satisfied the criterion on mortality levels, we then selected the countries which already had existing community health worker (CHW) programmes and a supportive MoH for this intervention. These countries were Mozambique, South Sudan, Uganda and Zambia.

2.1.2. Implementation model and intervention mixes

Table 2: Intervention mixes in different implementation settings with changes from original for actual implementation shown in bold italics

Area, Country	Implementation setting	Community-based case management algorithm
<p>Inhambane province, Mozambique</p>	<ul style="list-style-type: none"> Formal health system allowing for limited referral Average-to-good literacy Drug regulation (allows use of amoxycillin possible at community level) MoH currently revising national strategy for ICCM National policy: ICCM delivered by Agentes Polivalentes Elementares (APEs), 25 APEs/district, between 8—25 kilometre radius from health facility, treating all ages for malaria and only under-fives for pneumonia and diarrhoea, supervisors are health facility staff, paid a small monthly subsidy 	<p>Child presents with fever and/or coughing and fast breathing</p> <ul style="list-style-type: none"> Use respiratory timer and if high respiratory rate treat with amoxycillin Then perform malaria rapid diagnostic test (mRDT) If positive: treat for malaria If negative, and in absence of disease danger signs but presence of fever, treat with paracetamol If child has severe febrile illness, refer to facility. <i>If has malaria-related danger signs, give a pre-referral treatment of rectal artesunate</i>
<p>Unity State, South Sudan</p>	<ul style="list-style-type: none"> Absence of a formal health system allowing for referral Very low literacy Absence of drug regulation National guidelines: One community drug distributor (CDD) per 40 households, volunteers, treating only under-fives, supervisors recruited and paid 	<p>Child presents with fever and/or coughing and fast breathing</p> <ul style="list-style-type: none"> Presumptive treatment with ACT <i>Use respiratory timer</i> and if fast breathing, treat also with amoxycillin If child has fever, also give paracetamol (<i>this was removed from actual mix</i>) If child has severe febrile illness, refer to facility <i>Screen for malnutrition and refer to nutrition programme</i>
<p>Nine districts, Mid-Western Uganda</p>	<ul style="list-style-type: none"> Formal health system allowing for limited referral Average-to-good literacy Limited drug regulation (use of amoxycillin possible at community level) Home management of malaria implemented at national scale using a phased approach since 2003 National policy on ICCM endorsed in early 2010 including rectal artesunate for pre-referral of severe malaria National policy: ICCM delivered by village health teams (VHTs), volunteers. treat only under-fives, two ICCM providers per village, supervisors are health facility staff 	<p>Child presents with fever and/or coughing and fast breathing</p> <ul style="list-style-type: none"> Use respiratory timer and if high respiratory rate treat with amoxycillin Then perform mRDT If positive: treat for malaria If positive with signs of severe illness, give pre-referral treatment of rectal artesunate If negative, refer child to health facility If child has severe febrile illness, refer to facility <i>Screening of newborns for danger signs and if present first dose of antibiotic and antimalarial before referring to health facility</i>

Area, Country	Implementation setting	Community-based case management algorithm
Luapula province, Zambia	<ul style="list-style-type: none"> • High level of access to formal health system allowing for relatively easy referral • Home Management of Malaria with mRDTs already national strategy and being implemented in phased approach since 2007 • Average literacy • Drug regulation (use of amoxycillin possible at community level) • Currently developing a national strategy for iCCM • National guidelines: One community health worker (CHW) per 2,000 total population, volunteers, treating only under-fives, supervised and supported by health facility staff 	<p>Child presents with fever and/or coughing and fast breathing</p> <ul style="list-style-type: none"> • Use respiratory timer and if high respiratory rate treat with amoxycillin • If respiratory rate normal but with fever, perform mRDT • If positive: treat for malaria • If negative, and in absence of disease danger signs but presence of fever, treat with paracetamol • If child has severe febrile illness, refer to facility

The major interventions aimed to support and strengthen community-based case management programmes for malaria and pneumonia by providing free diagnosis and treatment, training, job aids, supervision, and communication for behavioural change of caretakers and health staff. For malaria, the treatment was artemisinin-based combination therapy (ACT) according to the first line treatment in the country plus, with the exception of South Sudan, and malaria rapid diagnostic tests (mRDTs) for the confirmation of *Plasmodium falciparum* parasites. In Mozambique and Uganda, rectal artesunate was also included as a pre-referral treatment for cases of severe malaria. For pneumonia, the diagnostic tool was the UNICEF respiratory timer to measure the respiratory rate and assessment for chest in-drawing; treatment was provided in the form of dispersible tablets of the antibiotic amoxycillin.

2.1.3. Additional aspects of programme

Malaria Consortium focused on a number of key features of a feasible and sustainable ICCM programme. These were:

- Linkages with the formal health service, including strong supportive supervision and an effective referral system
- Supply management of medicines and other commodities in order to minimise stock-outs and ensure easy availability of new supplies for CHWs
- Strong monitoring and evaluation of the programme, including effective routine data collection from the CHWs
- Communication for behaviour change, promoting use by communities of CHWs providing ICCM services and increasing awareness in communities of appropriate health care choices
- Value for money assessment of ICCM project activities, particularly in terms of the impact on under-five mortality

2.1.4. Monitoring, evaluation and operational research

One of the first activities of the programme was the participation of Malaria Consortium's Monitoring and Evaluation (M&E) Director in a workshop organised by CIDA in June 2009 with other

recipients of similar grants to develop a harmonised M&E plan. This plan included a commitment to conduct baseline and endline surveys to measure impact in all four implementation countries; baselines were to be conducted as the first main project activity prior to the start of activities and endlines after approximately two years of implementation of ICCM. The endline surveys would include a component to measure under-five mortality rates using a birth history methodology and sampling from comparator areas. One of the advantages of using birth history methodology is that baseline mortality estimates can be obtained retrospectively and hence only one survey needs to be undertaken to estimate mortality rates. The main comparison of these estimates was at the end of the project between the intervention area and a comparator area in each of the countries representing a probability evaluation of the impact. These comparator areas were purposely selected sites where no intervention which could impact on child health was deemed likely to happen due to the absence of resources. For this reason, the selection of the comparator areas was delayed to minimise the possibility that an intervention would start during the course of the project. In addition, a mid-term survey was planned in Uganda to assess any impact on under-five morbidity and mortality after one year of ICCM activities. This survey which was downscaled to assess coverage only was conducted just in Uganda as the scale of implementation was largest there and therefore most likely to detect any changes or trends linked to ICCM implementation. Throughout the period of ICCM implementation, routine data would be collected from the programme for a series of process/output indicators.

The grant agreement also defined a number of topics for operational research which would be completed during the course of the programme. These included evaluating the cost effectiveness of mRDTs, using a mix of qualitative and quantitative research methods to assess CHW performance, and other operational research questions relevant to ICCM.

2.2. History of significant changes to the programme during its lifetime

- **Inclusion of diarrhoea in implementation model:** The original proposal focused on management of fever in under-fives by treating malaria and pneumonia. Subsequently, a request was made to CIDA by Malaria Consortium to also include oral rehydration solution (ORS) and zinc supplement for the management of diarrhoea, given its important role in causing under-five mortality. Later in 2009, Malaria Consortium also received a grant from the Bill & Melinda Gates Foundation (BMGF) for operational research, to be conducted within this ICCM programme, on motivation and retention of community health workers. It was a requirement of the BMGF grant that the intervention include care of all three diseases. In Mozambique and Uganda, it was agreed that the diarrhoea component would be included as part of the intervention from the start of implementation. However, as CIDA required evidence of the impact of this component alone, it was agreed that a stepped approach would be used for its introduction in the two other countries – South Sudan and Zambia. This meant that the diarrhoea component would be rolled out one year later than the malaria and pneumonia ones. Due to the early closure of the project in South Sudan it was not possible to introduce the diarrhoea component. In Zambia, the period of implementation in practice was too short to detect any measurable impact attributable to the diarrhoea component alone.
- **Exclusion of paracetamol in South Sudan and Uganda:** Under this grant it had been anticipated that paracetamol would be included in the medicine kit for ICCM in all countries as a medicine to reduce fever (antipyretic). This would provide a medication that could be used to manage fever cases who are mildly ill and do not have malaria or pneumonia as demonstrated by an mRDT or a measured respiratory rate. However, in both South Sudan and Uganda, following much debate, both countries decided that they would not include this drug due to concerns about possible toxicity through overdosing. As this programme was committed to staying within national policies, paracetamol was excluded from the model in these two countries.

- **Modification to mid-term evaluation:** In the original grant agreement, Malaria Consortium committed to conduct a mid-term mortality evaluation in Uganda. This was scheduled to occur between six and 12 months of project implementation, with the draft evaluation report submitted within 20 months of grant signing (i.e. end of November 2010). Due to delays in the roll-out of ICCM training in Uganda, it became necessary to revise this timeline. In addition, it had become apparent, partly through other grantees' experience, that in this period of time it would be impossible to detect any impact on under-five mortality that could be attributable to this project. As a result, a second grant amendment was signed in June 2011 to allow the mid-term evaluation to be conducted to measure changes in access to prompt and effective treatment after no more than 12 months of ICCM implementation.
- **Amendment to endline survey in Mozambique:** The MoH's cap on Agente Polivalente Elementare (APE) recruitment and training in 2010 meant inadequate coverage for ICCM services. This significantly reduced the likelihood of ICCM having an impact on mortality by December 2012. Furthermore, the very protracted process of revitalisation of the national APE strategy meant that Malaria Consortium could only complete ICCM training roll-out in late 2011. As a result, a formal request was submitted to CIDA in December 2011 to reduce the scope of the endline survey in Mozambique exclude the mortality assessment and use instead the Lives Saved Tool (LiST) approach to estimate the projected number of under-five year lives that could be saved through this ICCM project. This was approved by CIDA and included in the third grant amendment.
- **Reduction of scale of implementation in Mozambique:** Shortly after our ICCM programme started in early 2009, the Mozambican MoH initiated a revitalisation of the national community health worker (APE) programme. This entailed retraining all existing APEs and recruiting and training new APEs for identified underserved areas. As the numbers of APEs had steadily declined in the preceding years, an urgent scale up of APEs was necessary to achieve a level of ICCM service coverage sufficient to have an impact on mortality. However, the MoH in December 2010 formally released its plans, committing to support only a maximum of 25 APEs per district for the first phase of the revitalisation with no clear timeline for further scaling up.
- **Early closure of project in South Sudan:** Escalating insecurity in Unity State from mid-late 2011 through 2012 necessitated a significant downscaling of ICCM project activities as access to the field and communities became more restricted. Following months of remote management of ICCM activities, where it was impossible to monitor the quality of delivery, it was agreed with CIDA that the project would close early. Consequently the office in Unity state was closed in May/June 2012, though it was still possible to partially implement the endline survey in one intervention and one comparator county as part of a joint survey with Save the Children and International Rescue Committee (IRC) as previously agreed. The security situation also led to the original plan to conduct operational research on the cost-effectiveness of malaria rapid diagnostic tests (mRDTs) in Unity being abandoned.
- **Extension of programme timelines:** In November 2012 a request was made to CIDA for a three month no-cost extension until 31st March, 2013. The innovative nature of this programme required designing from scratch, and followed an approach of being embedded within the MoH and involved the introduction of new national policies and strategies. All these aspects added to the complexity of programme implementation and the time required was pushed to the maximum. The specific reasons for the extension were for time to complete analysis of endline surveys, to facilitate transition of project activities to new funding sources, and to complete the final programme report. This was approved by CIDA and included in the third grant amendment signed in December 2012.

3 GENERAL UPDATE OF LAST REPORTING PERIOD: 1 FEBRUARY 2012-31 MARCH 2013

2.3. Policy environment and context

The implementation model for the programme has some core components that are included in all countries – artemisinin-based combination therapies (ACTs) for malaria, amoxicillin dispersible tablets for pneumonia, low osmolarity oral rehydration solution (ORS) and zinc tablets for diarrhoea, and the use of packaging designed for community level use. Other components correspond to national policy for treatment at community level and thus vary from country to country.

The national guidelines for ICCM have been finalised in Uganda and Mozambique, while in South Sudan and Zambia they remain at a developmental stage. In Zambia, following the elections in October 2011, the new government decided to realign the functions of the Ministries of Health and of Community Development Mother and Child Health. The Ministry of Health now oversees policy, tertiary and province level hospitals, and Provincial Medical Offices. The Ministry of Community Development Mother and Child Health (MCDMCH) has responsibility for District Medical Offices, district level hospitals, health centres, health posts, and community volunteers including community health workers. This policy change resulted in most of this project's work falling under the MCDMCH. There is currently no policy on ICCM in Zambia; however, the national Integrated Management of Childhood Illnesses (IMCI) strategic plan 2011–2015, which is currently in draft form, includes aspects of community level diagnosis and treatment of malaria, pneumonia, and diarrhoea.

Two of our implementation countries – South Sudan and Zambia – have started to consider different cadres of health workers that would work at community level. These are both still at the concept or design phase, and Malaria Consortium has used available fora to highlight how these new cadres could complement the community volunteers already trained by our CIDA-ICCM programme, which aims to be MoH-led. In Zambia, these health workers, called Community Health Assistants (CHAs), will receive one year's training in primary health care, including both theory and practical training. They will be based at health posts in a salaried position. The government aims to train 5,000 CHAs by 2015. There is the potential for good synergy here as the CHAs would be ideally placed, both geographically and in terms of training, to provide supportive supervision to the CHWs trained in ICCM.

In South Sudan the new cadre is called a Home Health Promoter (HHP) and although they receive nine months of training, they are expected to work as volunteers with no remuneration. Their areas of focus include health promotion, treatment of simple cases of common childhood illness, referral of pregnant women to antenatal care and of cases of severe disease to health facilities, as well as surveillance. This training is currently being rolled out in a localised manner, dependent on partner support. Malaria Consortium continues to participate in technical discussions to decide how this new approach would fit with the existing CDDs who have been trained in ICCM.

2.4. Additionality

There are a number of additional activities organised by Malaria Consortium but separately funded which reinforce the CIDA-supported programme, as they relate to delivery of treatment for the three diseases to children under five in the programme implementation areas.

2.4.1. Mozambique

Malaria Consortium linked with the United Nations Children's Fund (UNICEF) Reach Every District (RED) programme, which includes support for the revitalisation of the APES strategy. RED has five focus districts in Inhambane province, where funds can be used to cover the full four month training,

the APEs' work kit, the ongoing supportive supervision and a monthly subsidy to the APE for one year. In addition, Malaria Consortium has received funding from the Planet Wheeler Foundation to help finance the full four month training programme for APEs as well as health promotion and behaviour change activities, such as radio spots on the APEs programme.

Malaria Consortium allocated funding in Mozambique from a DFID Programme Partnership Arrangement (PPA) in 2012, which covered the cost of procuring 15 computers for the district health offices and the provincial health office in Inhambane. This will greatly increase their capacity to enter and analyse data from APEs in a timely manner and enable them to better monitor the functioning of the programme. Malaria Consortium installed the ICCM database on these computers, and gives guidance to district data managers on how it should be used. The DFID Programme Partnerships Arrangement (PPA) will also provide funds for refresher training of APEs across Inhambane province in antenatal care so that they can give sound advice and support to pregnant women.

2.4.2. South Sudan

The CIDA-ICCM funded project in Unity State coordinated efforts with the Common Humanitarian Fund in Sudan (CHF) and UNICEF from April 2010 until March 2012 to include community based therapeutic management of acute malnutrition (CMAM) as another activity implemented by CDDs. This sharing of funds lessened the burden of running costs and logistics in the CIDA budget. It also contributed to addressing a huge problem of malnutrition in the area.

2.4.3. Uganda

As in previous years, the project continued to benefit from the presence of the Pioneer project, funded by Comic Relief UK and being implemented in five of the same target districts. This project continues to work with CIDA-ICCM to supply rectal artesunate for use in the management of severe malaria to all VHTs trained in ICCM. In addition, it has provided training and supplied mRDTs for malaria to all health facilities which are referral centres for VHTs and which have no functioning laboratory service to diagnose malaria. Lastly, it has trained health workers (VHT trainers and supervisors) in supply chain management, including quantification of supply needs. The project in Uganda also benefited from DFID PPA funds to cover the procurement of malaria mRDTs for referral health facilities in the two districts where Pioneer is not active. The funding also covered training and supervision in the use of mRDTs for health facility workers.

2.4.4. Zambia

Finances were also obtained from the DFID PPA to support the recruitment of a behaviour change communication officer and the logistical support needed for implementation of community dialogues. These funds also supported efforts to enable timely collection of routine data from CHWs. These were areas identified as constraints in the existing project. Furthermore, this CIDA-funded project shared the cost of operational research with a COMDIS-HSD grant funded by DFID on rational use of antibiotics.

2.4.5. inSCALE project

In Mozambique and Uganda, the CIDA-ICCM programme has close links with Malaria Consortium's inSCALE programme (Innovations at Scale for Community Access and Lasting Effects) funded by BMGF. In October 2009, Malaria Consortium was awarded this five year grant following discussions with CIDA in Canada about the potential synergies that could be gained by linking the two programmes. inSCALE identifies and documents best practices in starting up ICCM at sub-national levels and evaluates innovations with the potential to increase coverage and improve quality of ICCM through better performance and retention of CHWs. inSCALE also promotes implementation and scale-up of ICCM by sharing its experiences and findings with the MoH, sub-national health authorities, and stakeholders.

The CIDA-ICCM programme, particularly in Mozambique and Uganda, has gained from inSCALE's work as it provides additional capacity and resources to evaluate the CIDA-ICCM project and to explore innovations to improve the effectiveness and impact of this work. The inSCALE programme in turn benefits as it does not have funds for actual implementation of ICCM and, therefore, conducts its evaluation activities within the CIDA ICCM project.

In both countries, the two field teams work very closely on a daily basis, maximising mutual benefits for the two programmes. Good examples of this during this reporting period include the continued inputs from inSCALE health economists for costing of ICCM activities and the involvement of inSCALE team members in national technical working groups, particularly in Mozambique. Furthermore during this period, both projects benefited from the opportunity to conduct a joint survey because the timing of the CIDA-ICCM endline survey coincided with a required baseline survey for inSCALE. Both surveys required collection of very similar data and it was possible to modify the data collection tools to match indicators for both projects. inSCALE has an important advocacy component and both programmes are working closely together to develop materials and hold events that can be used to advocate for more support for ICCM both nationally and internationally. Whilst the synergies of linking two programmes outweigh the disadvantages, there are risks when one is dependent on the other, and shifting timelines of implementation have led to a need to raise further resources beyond the CIDA grant to allow adequate evaluation of inSCALE's interventions. Identification of further resources have been challenging but has been achieved for Mozambique, and continues to be pursued for Uganda.

2.4.6. DFID PPA support for documentation of ICCM experience

In addition to the country-specific funding from the DFID PPA outlined above, the CIDA-ICCM programme secured PPA funds to comprehensively document the process of establishing ICCM projects in four very diverse settings. This included a participatory evaluation of our ICCM work in South Sudan, Uganda, and Zambia. This involved documenting experiences, lessons learnt, and best practices for the delivery of healthcare service at community level, with input from a range of stakeholders involved in planning and implementation of our ICCM work.

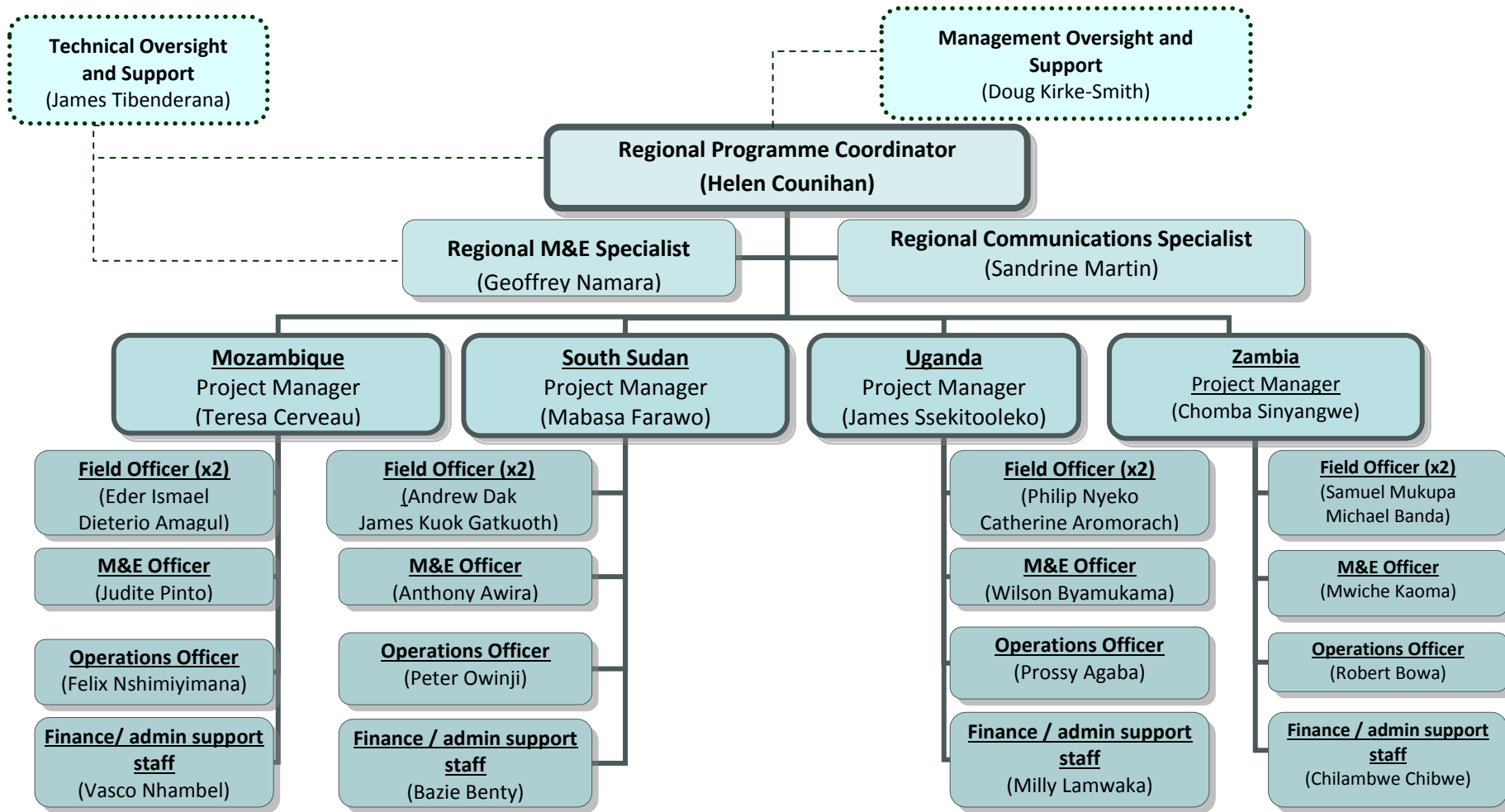
3.2.7. Efforts to maximise 'additionality'

As can be seen by the information presented above, Malaria Consortium values opportunities to link different funding streams to strengthen the scope and delivery of projects. All the additionalities listed above have come about as a direct result of our efforts to secure these collaborations.

2.5. Programme personnel

Over this reporting period the personnel of the programme stayed reasonably constant, with a small number of changes in the field teams. Management oversight changed due to internal structural changes in Malaria Consortium's Africa Regional Team. The diagram below gives an updated picture of the team involved in the CIDA ICCM programme.

Figure 1: Updated organogram of programme's management and field teams






2.6. Overview of programme progress from February 2012 to March 2013

An overview of implementation progress can be found in Table 3, which summarises main activities for all countries.

Table 3: Progress of activities from 1 February 2012 to 31 March 2013, shown by objectives and country

ACTIVITY PROGRESS TABLE				
Objectives and Key Activities	Country			
	Uganda	S Sudan	Zambia	Mozambique
Objective 1: Procure and deliver health commodities required for successful implementation of ICCM				
Activity 1.1: Establish and maintain procurement system incorporating commodities most appropriate for use in ICCM				
Activity 1.2: Develop and maintain systems for the delivery and distribution of ICCM commodities to community level				
Activity 1.3: Revise quantification of commodities based on actual consumption rates for ICCM				
Objective 2: Carry out frontline activities to ensure effective implementation of a high quality ICCM programme across four countries				
Activity 2.1: Plan and coordinate ICCM programme activities both internally and externally with key partners				
Activity 2.2: Train health workers in all aspects of ICCM implementation				
Activity 2.3: Implement ongoing supportive supervision of ICCM providers including plan for supervision at different levels				
Activity 2.4: Implement behaviour change and communication strategy to promote knowledge and acceptance of ICCM strategy				
Objective 3: Carry out non-frontline support activities to support effective implementation of a high quality ICCM programme across four countries				
Activity 3.1: Work with MoH and stakeholders to provide technical support to the development of ICCM policy and guidelines				
Activity 3.2: Provide oversight to the ICCM programme on all aspects including technical, managerial, operational and financial				
Activity 3.3: Ensure strong programme support to enable timely and effective implementation of programme ICCM activities				
Objective 4: Monitor implementation and evaluate the impact and cost of different programme mixes in different health system settings				
Activity 4.1: Completion of baseline surveys, data analysis and presentation of key findings				
Activity 4.2: Completion of midterm survey in Uganda including analysis of data and presentation of findings				
Activity 4.3: Completion of endline survey and analysis				
Activity 4.2: Design, establish and implement systems, adapted for each country context, for ongoing data collection on key indicators of ICCM activities including data flow framework, data collection forms and database.				
Activity 4.3: Create systems for collection of financial information for costing of the programme activities ¹				
Activity 4.4: Complete operational research studies to address use of antibiotics for pneumonia within ICCM, assess quality of community health worker (CHW) performance and pilot use of mobile phones for routine reporting of ICCM data				

	Fully completed
	Partially completed
	Not completed

¹ In Zambia, we have linked with MSH to do a costing analysis of ICCM project activities, this work is still underway and the resulting report will be shared with CIDA when completed. Due to the operational constraints and early closure of Unity office and project activities, it was not possible to develop systems to collect accurate costing information in South Sudan.

2.1. Summary of key activities during last reporting period (1 February 2012-31 March 2013)

Below is a summary of the main achievements and activities of the programme in the last reporting period. More details can be found in the country reports in Annex 2.

2.1.1. Procurement

Previously, a tool was developed by this project in Uganda to use commodity consumption data to calculate the monthly commodity requirements for ICCM. This tool has been adapted for use in the other countries. As a result, during this reporting period Malaria Consortium was able to calculate more accurately the quantities of the medicines and medical supplies needed based on previous actual consumption data, except in Mozambique where no prior procurements had been done.

In Mozambique, the process of procuring and importing drugs was completed during this period and these commodities were fully received in-country by June 2012. Uganda and Zambia undertook one last round of procurement of ICCM commodities; most were received in-country by the end of March 2013.

In late 2012, Malaria Consortium conducted a stock audit across the four countries as part of our implementation monitoring system. The findings were communicated to CIDA. Findings included the loss of key records from the Zambia project as they were being transported to our regional office. In South Sudan, due to the early closing of the field office and the subsequent leaving of two cars in Unity state, it was not possible to transport the documents from the project back to Juba. In Uganda and Mozambique, the stock audit indicated that the stocks were as indicated in the documents, with very minor discrepancies. A summary report of the process and findings can be found in Annex 1.

2.1.2. Training

During this last reporting period, the main training of new CHWs was in Zambia where ICCM training was rolled out to three comparator districts in Luapula province. In total, 612 new CHWs were trained, reaching 100% of the target of 1,332 trained CHWs across the province. Uganda responded to its VHT attrition rate, which had a cumulative total of 7.4% after approximately 2 years, by training 132 replacement VHTs in ICCM. Unfortunately, due to insecurity and the early closure of the project in South Sudan, it was not possible to conduct further training. All planned APE training in Mozambique was completed in the previous reporting period although refresher training in ICCM was subsequently conducted for 261 APEs across all of Inhambane province.

2.1.3. Supportive supervision

Supportive supervision continued during this reporting period in Uganda and Zambia, but was severely limited due to insecurity in South Sudan while the ICCM project was still functioning.

Activities relating to supervision include a combination of supervision visits to the CHW and supervision meetings where the CHWs meet as a group with their supervisors. In Uganda, for the last three months of project activities the number of supervision activities completed came within 98 percent of the total target number. During this reporting period, in Zambia a total of 9,592 supervision activities were completed. In Mozambique, supervision activities commenced in November 2012, in accordance with a plan agreed with the Provincial Health Department to conduct the supervision jointly.

2.1.4. Behaviour change communication

The strategy for behaviour change communication (BCC) for this programme was outlined in previous annual reports and is summarised in Table 4 below.

As of March 2012, the mix of communication activities was finalized and detailed implementation plans were developed and shared with stakeholders in each country. Design and printing agencies were also identified for the production of materials. In 2012 there was full implementation of BCC activities, including training for community-based facilitators for community dialogues on child health themes in three countries: Mozambique, Uganda, and Zambia. Between June and November 2012, a series of monitoring visits of BCC activities were conducted by CIDA ICCM in collaboration with district and health facility staff across the three countries, when observation sheets of community dialogues were collected. In South Sudan, due to security restrictions in Unity state, it was not possible to conduct any BCC activities during this reporting period.

Interventions focused on the promotion of timely use of CHW services and building trust among communities in the benefits of early care-seeking for sick children. It combined the diffusion of information through mass media to market CBAs' services and participatory Community Dialogues implemented at village level to set social norms around care and preventive practices for child health and trigger community ownership of the services. The Community Dialogue² (CD) model developed by Malaria Consortium is a form of community mobilisation and empowerment process aimed at promoting ownership and utilisation of ICCM services. This approach provides a unique platform for care-givers and community members to have a participatory in-depth discussion at village level around the ICCM programme. It aims at removing barriers to optimal behaviours through identifying key issues (by community members themselves) and agreeing on local solutions that community members can take to improve healthcare of sick children at community and household level.

Support messages included basic information on CHWs' services, the targeted diseases' signs, the importance of complying with treatment and/or referral to the health facility, as well as basic home-care of the sick child and preventive practices.

Table 4: Summary of BCC approaches in the three countries

Country	Campaign motto	Communication mix	
Zambia	<i>Fight the three, keep children healthy</i>	Community Dialogues Set of posters	
Mozambique	<i>Hand in Hand with CHWs! Let's give a good life to our children</i>	Radio daily interactive programme Community Dialogues	Co-funded by Planet Wheeler Foundation, and produced in partnership with Radio Inhambane
Uganda	<i>Keep good health, enjoy life</i>	Radio spots and talk shows Set of Posters Community Dialogues	Co-funded by the PIONEER Project (Comic Relief)

² For a full description of the approach, see: Community Dialogues for Healthy Children. Malaria Consortium Learning Paper Series. 2012. Available at http://www.malariaconsortium.org/flip-books/community_dialogues_for_healthy_children/.

2.1.5. Monitoring and evaluation

During this reporting period, evaluations of the impact of the programme on child mortality were conducted in all four countries. In Uganda, Zambia, and South Sudan, mortality was measured using the direct methodology through collection of birth histories from women. Sample size calculations required interviews of women in approximately 4,000 households in each of the intervention and comparator areas. With a cluster size of 40 households, 100 clusters were sampled in each group, with probability proportionate to village size. Child health and health seeking behaviour required a smaller sample size of 1600 households/40 clusters. Within the selected 100 clusters in the intervention areas, a sub-sample of 40 clusters was randomly selected in which child health interviews were conducted. In addition, a malariometric component to assess malaria parasite prevalence and other biomarkers was also included in the Uganda endline survey.

All tools were adapted from similar modules from the standard Demographic and Health Survey/Malaria Indicator Survey instruments. Research assistants underwent a five day training on the tools. Data were double entered and analysed using STATA 12. In Mozambique, as previously stated, the mortality survey was not conducted but rather impact was estimated using the Lives Saved Tool (LiST).

Table 5: Timing of endline surveys

Country	Dates
Mozambique	Sept – Nov 2012
South Sudan	Apr – May 2012
Uganda	Oct – Dec 2012 (2 comparator districts Feb 2013 ²)
Zambia	Sept – Dec 2012

²Collection of data in two of three comparator districts had to be delayed due to an outbreak of Ebola virus

The key findings from the endline surveys are included in Section 5.

Case Study: Come on inside, there's no malaria in here!

Interview with a mother a daughter in Inhambane, central Mozambique



Esperança Watemane is 75 years old and lives with her daughter Amélia Jaime Chissico in Lindela, a community in the province of Inhambane, central Mozambique. The two women were eager to invite me into their home, to show me the mosquito net (long lasting insecticide treated net or LLIN) that they had hung up inside. The mosquito net protects the women from malaria-transmitting mosquitoes that bite during the night. Malaria is highly endemic in the area and in 2010 there were over 4.5 million suspected cases of the disease in the country.

As well as nets, the women explain that the community now has easy access to a trained health worker, Mrs Arnalda, who is based in the community and provides care for under-fives.

“In the past,” Esperança explained, “if a person was suspected to have malaria, we would use boiled roots and try to expel the bad spirits.”

Now, children suffering from fever or other symptoms are taken to see Mrs Arnalda, whose health station, a small building where she receives visits from community members, is just 50 metres from Esperança and Amélia’s home.

The women explain that Mrs Arnalda is a great support to the community. She has been trained in primary health care, including in how to diagnose malaria using rapid diagnostic tests (RDTs) and how to treat non-severe malaria. She treats children both at her health station and in their family homes. If the disease is really severe, Mrs Arnalda refers the child to the nearest Health Centre in Jangamo and, if necessary, accompanies them there.

5 PROGRESS AND ACHIEVEMENTS OF THE PROGRAMME OVERALL

Since the programme began delivery of ICCM services in 2010 it has collected data on main achievements against a set of indicators included in the grant agreement and in the final Monitoring and Evaluation Plan approved by CIDA in August 2009. These results are presented in the following sections and grouped under those gathered through routine data and those gathered through the survey data (coverage and impact). This section continues with a description of the operational research studies conducted through this programme including key findings. Section 5 then finishes with an overview of other key achievements during the implementation of the programme.

2.2. Routine data

2.2.1. Data collection and reporting processes

The data collection and reporting processes were largely similar across countries, though each country had slight variations. In all countries the CHWs completed registers for each consultation with a sick child. In South Sudan these registers were pictorial and collected very basic information due to the low literacy. At the end of each month, CHWs submitted their reports to their supervisors, and these were then compiled into group summaries and submitted to a higher level. In Uganda, VHT summary aggregation and submission to the health facility was done by peer VHTs (called Parish Coordinators) nominated by fellow VHTs, and served a number of villages. In South Sudan, collection of the CDD reports was done during the monthly visit by the CDD supervisors, who were more literate community members selected for this role. Across the countries, the CHW summary forms were submitted to the district and, in some countries, copies were also sent to Malaria Consortium. On occasion, forms were picked up at health facilities by Malaria Consortium field officers while on routine CHW supervision visits. In Mozambique, summary information on the APE forms was included in the health facility data system (SIS); Malaria Consortium was able to collect the ICCM data by extracting it from summary aggregated SIS forms at provincial level. Details on the process in each country are in the country reports in Annex 2. Data collection commenced immediately after the training of ICCM providers was completed, and the variation in duration between countries as seen in Table 6 reflects the different timeframes of ICCM implementation.

Table 6: Duration of data collection

	Mozambique	South Sudan	Uganda	Zambia
Months	8	15	30	25

2.2.2. Scale of training

As the programme was designed to support and strengthen Ministry of Health strategies for ICCM across all countries, the scale of training changed depending on the national model. At one end of the spectrum, the Ugandan model of two VHTs delivering ICCM in every village necessitated the training of more than 7,000 people in a six day ICCM curriculum. To achieve this scale, Malaria Consortium used a cascade training approach, as previously described. At the other extreme, in Mozambique the model was just 25 APEs per district, but the training curriculum, which included health promotion, was for a duration of four months.

Table 7: Numbers of CHWs trained

	Mozambique	South Sudan	Uganda	Zambia	Overall
Targeted	175	1,720	6,800	1,332	10,027
Trained	165	805	7,583	1,332	9,882
% trained	94%	46%	112%	100%	99%
Retrained	261	-	6,774	720	
Dropped out of programme	3	42	485	68	
Cumulative attrition since start of implementation	1.8%	4.4%	6.4%	5.1%	

The difference between the numbers actually trained in Mozambique and the target is mainly due to participants dropping out during training because they could not achieve the required standard. The retraining was a short refresher training given to all new APEs just before they received their drug kits, and included those from the UNICEF supported districts. Zambia achieved exactly the target number of CHWs to train over two phases approximately one year apart according to the project design. The CHWs initially trained received refresher training at the time of the second phase of new CHW training. The scale of training in Uganda exceeded the target due to additional training been conducted to cover gaps caused by attrition of VHTs. In South Sudan the gap is due to the security situation and the consequent restrictions on project activities, including training. Overall, the project achieved close to the numbers planned for training. Great care was taken in developing training materials and curricula, and presence of a member of the core group of master trainers at each training event contributed to quality control of this critical component. If resources had been sufficient, further efforts to have post-training assessments within a few months of training would have been valuable, but refresher training and quality assessments relied mainly on supportive supervision.

Table 8: Training of health facility staff in ICCM and as CHW supervisors

	Mozambique	South Sudan	Uganda	Zambia
2010	-	48	549	50
2011	71	12	704	96
2012	89	-	83	65

In line with the principle of strengthening MoH capacity, the first training activity of the projects was to provide training to health facility staff, to equip them with the skills to enable them to be effective supervisors of CHWs. This included refresher training in IMCI, in the ICCM curriculum, and training as supervisors.

2.2.3. ICCM supportive supervision activities

A vital component of the ICCM programme was to develop a system for providing supportive supervision to the CHWs to ensure the quality of care delivered stayed high and to maintain the link with the formal health service. Furthermore, this interaction has been shown to be an important motivator for CHWs and makes them more likely to stay engaged and committed to their role. While there was variation in the models adopted for supervision in the different countries, there were many essential similarities – using a mix of peer group meetings with supervisors and individual visits to the CHW by the supervisor, either on a monthly or quarterly basis. The data in Table 9 are compiled from submitted supervision reports and represent a mix of both types of supervision contact.

Table 9: Number of ICCM supportive supervision contacts conducted

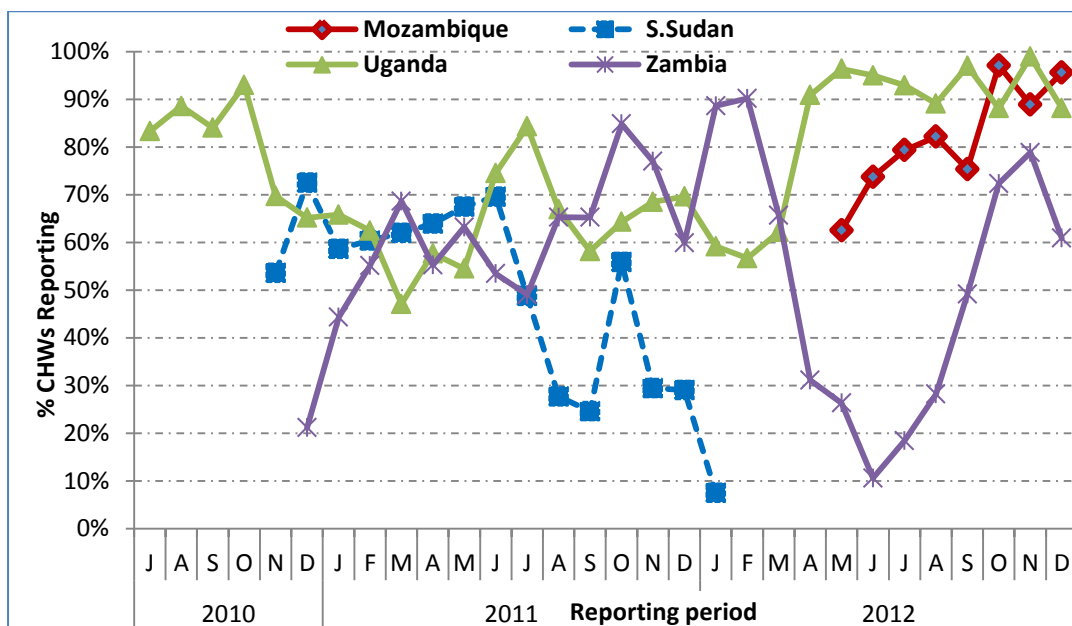
	Mozambique	South Sudan	Uganda	Zambia	Overall
2010	-	791	7,938	521	9,250
2011	-	3,905	19,063	6,656	29,624
2012	16	56	17,884	9,592	27,548
Total	16	4,752	44,885	16,769	66,422

Data source: ICCM project records

As would be expected, the highest number of supportive supervision contacts occurred in Uganda due to the large number of VHTs trained as well as the fact that it has the longest duration of implementation. By the end of 2012, the project was achieving 97 percent of the target number of supervisions. The majority of supervision contacts in both Uganda and Zambia were the quarterly group meetings as the health facility staff encountered many challenges in conducting individual supervision. These included lack of time due to large workloads and also lack of resources for transport. In South Sudan, as the supervisors were paid by the project for each supervision report submitted, the level of activities remained high, but it was difficult to check the accuracy of the reports submitted.

2.2.4. Reporting rates

Reporting rates (percentages of CHWs submitting monthly reports) have generally been good across all four countries with Uganda having the highest reporting rate (average 74 percent and by the last quarter rising to 99 percent). This figure indicates the percentage of CHWs that submitted a report every month over a two year period. Mozambique had the shortest implementation period during which the reporting rates have been very good (average 84 percent). South Sudan’s reporting rate steadily declined as the security situation worsened; for the entire implementation period, it had an average of 48 percent. In Zambia also reporting rates were not as high as Uganda, being 21 percent in 2010, 62 percent in 2011, and 46 percent in 2012, with an average of 42 percent over the entire implementation period. The main reasons for missing reports were either because the CHW did not submit their report or because the report was submitted but got misplaced. The latter was more common with the summary reports not being submitted to district level.



Data source: ICCM project records

Figure 2: CHW reporting rates during the programme implementation period

As can be seen in Figure 2, the trends for reporting rates have had many fluctuations over the course of the programme. However, while there is room for more consistency and improvement in these rates, it is worth noting that both Mozambique and Uganda show marked improvement over time. In Zambia, the reporting rate declined at the start of 2012 due to the additional 612 CHWs (46% of all active CHWs) who had been trained, were seeing children but hadn't yet become accustomed to reporting to the facilities. As evidenced in the graph, the trend was similar to 1st phase CHWs reporting trends in late2011/early 2012.

2.2.5. Management of cases through ICCM programme

Through the CHW registers, data were collected on all cases that presented to ICCM, including those with symptoms of the three focal diseases. The data cover the symptoms, diagnosis, and treatment given as well as, in some countries, the timeliness of seeking treatment following the onset of symptoms.

For cases of fever, malaria treatment was based on mRDT positive results with the exception of South Sudan where malaria treatment was given presumptively (Table 10). The SIS system in Mozambique did not collect information on the number of cases presenting with fever and the total mRDTs done, only the number of cases that tested positive. Through the Mozambican MoH M&E technical working group, Malaria Consortium is advocating for and contributing to the development of data collection tools that can also capture this information. The mRDT information presented is, therefore, only for Uganda and Zambia.

Table 10: Fever cases seen and managed through ICCM programme 2010 to 2012

	Mozambique	South Sudan	(%)	Uganda	(%)	Zambia	(%)	TOTAL
Number of cases								
With fever	N/A	30,656		822,427		293,632		1,146,715
mRDT performed	N/A	N/A		913,572	(111)	279,937	(96)	1,193,509
mRDT positive	9,811	N/A		607,326	(66)	224,410	(80)	841,547
ACT administered	11,528	30,197	(99)	610,048	(100)	219,883	(93)	871,656
Within 24 hours	N/A	N/A		349,414	(57)	109,954	(53)	
Within 48 hours	N/A	N/A				186,433*	(90)	

Data source: CHW summary reports collected routinely

*48 hour figure includes 24 hour and 48 hours

In Uganda, 11 percent more mRDTs than cases presenting with fever were done. This is mainly caused by a significant amount of initial mRDTs being inconclusive thus requiring an additional test to be done. However in some cases it is because the VHT decides to do an mRDT even when the child does not have a fever. In contrast, Zambia has a lower number of mRDTs done compared to cases of fever, which is linked to a period of stock-outs. This situation can also explain the lower number of ACTs administered compared to mRDT positive results. The positivity rate of mRDTs in Zambia is notably high at 80 percent, and higher than Uganda, which confirms previous data

indicating that Luapula province is highly endemic for malaria. The seeking of care within 24 hours of symptom onset is above 50 percent of total number of cases in both these countries where this information is collected, and is encouraging to observe.

In all countries, cases of suspected pneumonia were those that presented with a cough and/or fever and also had suspected fast breathing (Table 11). These were assessed using a respiratory timer and if the breathing rate was above the threshold, the child was treated for pneumonia with dispersible amoxicillin tablets. Again in Mozambique, the information detailing the cases presenting and the number of respiratory rate tests done is not collected through SIS.

Table 11: Suspected pneumonia cases seen and managed through ICCM programme

	Mozambique	South Sudan	(%)	Uganda	(%)	Zambia	(%)	TOTAL
Number of cases								
With cough & fast breathing	N/A	22,868		653,129 ¹		118,339		141,207
Assessed for high respiratory rate	N/A	22,826	(100)	653,129		108,846	(92)	784,801
Confirmed high respiratory rate	N/A	8,508	(37)	591,631	(91)	67,893	(62)	668,032
Received amoxicillin	9,967	22,732	(267)	590,667	(100)	67,621	(100)	690,987
Within 24 hours				254,442	(43)	22,129	(33)	
Within 48 hours						40,670	(60)	

Data source: CHW summary reports collected routinely

¹The VHT register in Uganda only records fast breathing as a symptom

In all countries, the ability to correctly assess fast breathing using a respiratory timer proved much more challenging for CHWs than performing an mRDT for malaria. This was addressed through supportive supervision where possible. The very high number of amoxicillin treatments given in South Sudan compared to those recorded with having a high respiratory rate is due to two factors that became apparent during the supervision visits. One is the possible high rate of errors in entering the results of the respiratory rate count as 37 percent seems very low. This is likely linked to the low literacy level among the CDDs. The other is non-adherence to treatment guidelines, whereby if the child had a cough, but a normal respiratory rate, they would still be given amoxicillin. By contrast, Uganda and Zambia have a very high correlation between a positive diagnosis and treatment given, which has improved over time.

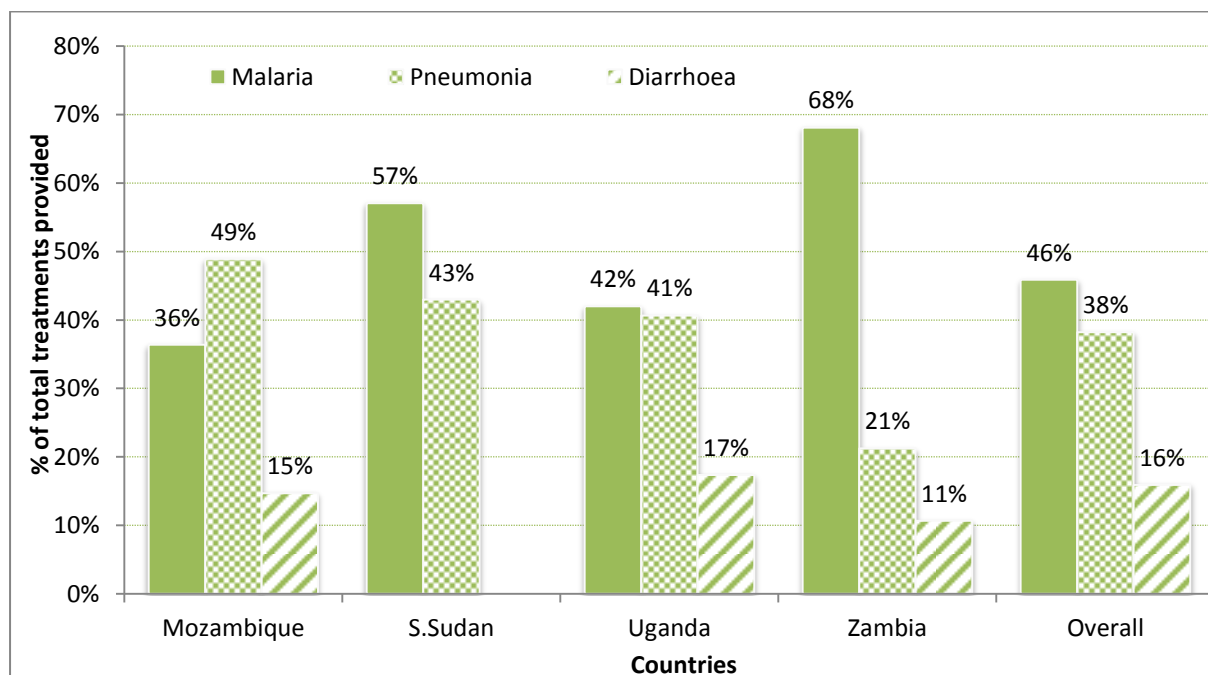
The ICCM programme also included ORS and zinc supplement for cases of diarrhoea – this was given based on reported duration and severity of diarrhoea. The only country that did not include this component was South Sudan as, through the phased design, this was only meant to be included one year after start of implementation. At that point, the security issues made it impossible to conduct the necessary training and roll-out.

Table 12: Diarrhoea cases seen and managed through ICCM programme

	Mozambique	%	Uganda	%	Zambia	%	TOTAL
Number of cases							
With diarrhoea	N/A		236,720		59,188		295,908
Received ORS	N/A		252,401	(107)	33,981	(57)	286,382
Received zinc	N/A		263,156	(104)	13,798	(41)	276,954

Data source: CHW summary reports collected routinely

The higher number of ORS and zinc treatments given in Uganda in relation to the cases presented is not straightforward to explain. One possible explanation is that children are rarely brought to VHTs with diarrhoea as the primary complaint. As this is often mentioned late in the consultation, it is likely that frequently the VHT forgets to enter this symptom in the register as they would need to go back to that section to do so. Recently it has been detected through supervision that some VHTs are giving zinc alone as a prophylaxis against diarrhoea but the reason behind this is as yet unclear. In Zambia, the much lower number of treatments given compared to number of cases is again linked to periods of stock-outs, which as previously reported were when the project had done insufficient procurement to match demand.



Source: CHW summary reports collected routinely

Figure 3: Relative frequency of disease treatments provided by CHWs through this programme across countries

Across the countries, with the exception of Mozambique, malaria remains the most common treatment given through ICCM. This may be partly due to the previous experience of providing malaria treatment at community level that was very well established in Uganda, for example. However, even recognising that Luapula province has the highest malaria parasite prevalence in Zambia, which is supported by a very high mRDT positivity rate, it is difficult to explain why the proportion is so high. This could also be a reflection of the low level of knowledge in the community

on how to recognise symptoms of pneumonia and awareness that this can be assessed and treated by CHWs. It is also notable that much fewer cases of diarrhoea are treated through ICCM compared to the other two diseases – this may be due to the availability of ORS through other sources and also to a tendency among caregivers not to consider diarrhoea as something requiring treatment.

2.2.6. Diagnosis and positivity rates

As ICCM programmes include diagnostic tests for malaria and pneumonia, data is recorded on the proportion of cases with symptoms that are indeed positive for these diseases. This information is displayed in Figures 4 and 5 below and includes fluctuations over time.

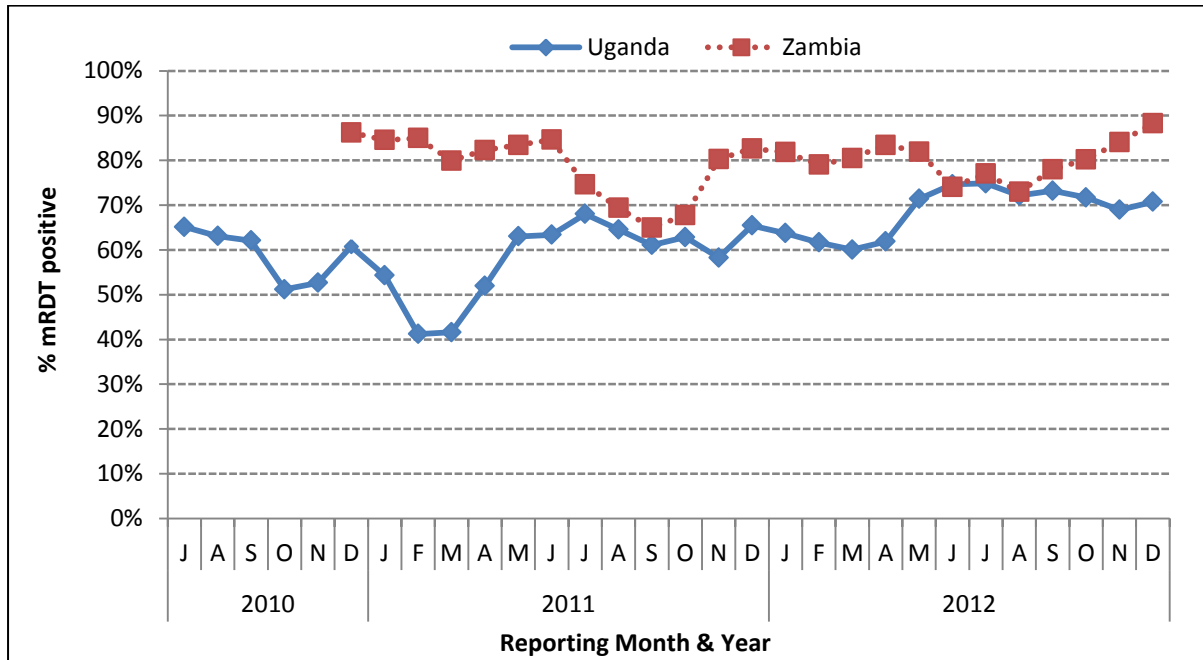


Figure 4: Positivity rates for malaria RDTs in children with fever in ICCM programme in Uganda and Zambia

For fever cases, it can be seen that Zambia consistently has a higher positivity rate than Uganda, as previously noted. Uganda shows more fluctuation but over time the positivity rate increases. This may be a function of improved capacity on the part of VHTs to assess fever cases and being more selective on whom they do an mRDT. There does not seem to be any seasonal pattern to the positivity rates. In Zambia there does appear to be a seasonal pattern, with lower positivity during the winter dry months (which would be expected).

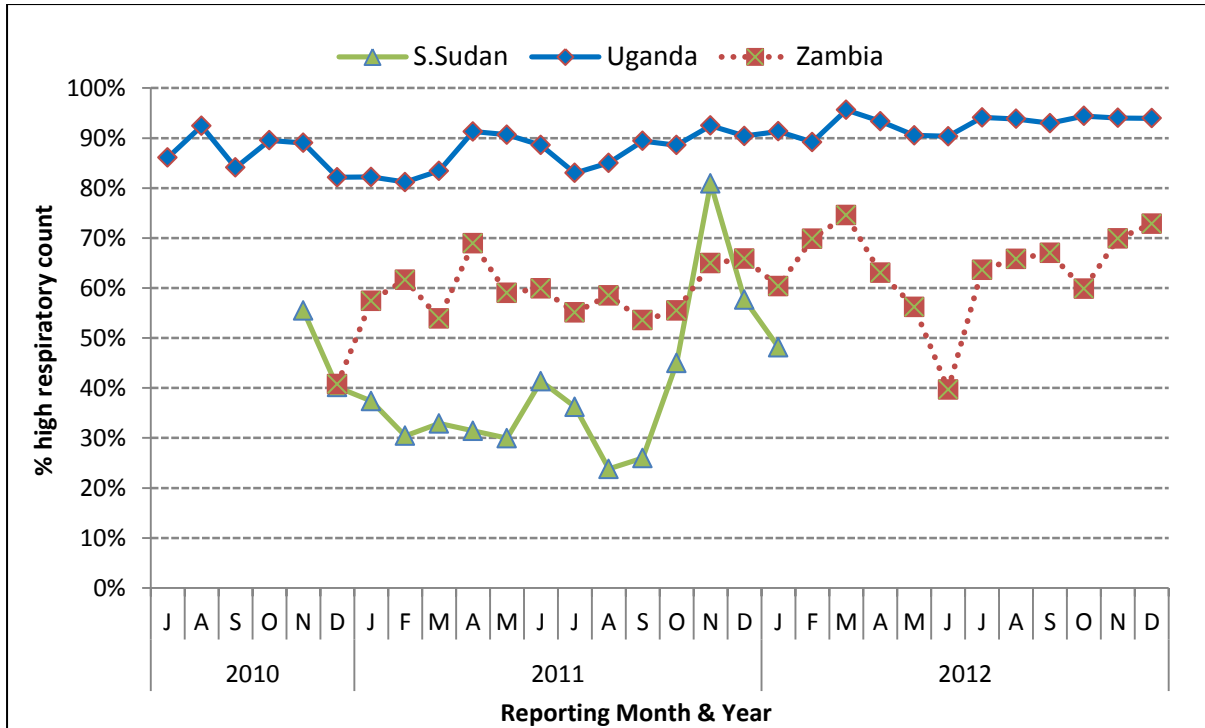


Figure 5: Recorded high respiratory rates in child with suspected pneumonia in ICCM programme in South Sudan, Uganda and Zambia

For pneumonia diagnosis, the proportion of cases with high respiratory rates in Uganda remains consistently high over the course of the project and does not seem to show any seasonal pattern. While in Zambia there is more fluctuation of positive cases, again there does not appear to be seasonality to this. The dip between March and June 2012 seen in Zambia appears to be linked to the training of new CHWs in the comparator districts, and may be a result of their initial inexperience in assessing fast breathing. In South Sudan the large fluctuations are most likely due to low ability to assess fast breathing accurately which was difficult to resolve and improve given the limited access for supervisors.

2.2.7. Variation between test results and treatment

An important indicator of quality of care delivered is the adherence to diagnostic test results when giving treatment. In an ideal situation for example, looking at the CHW records, there should be no variation between the number of positive mRDT results recorded and the number of ACTs administered. In Figure 6, this information has been plotted over the duration of implementation for both Uganda and Zambia. If there are more ACTs recorded than positive mRDTs, i.e. if the line is above 0 percent, this would indicate that there is over-treatment. In the opposite scenario, where there are fewer ACTs than positive mRDT results, it would indicate that confirmed cases of malaria are not receiving treatment.

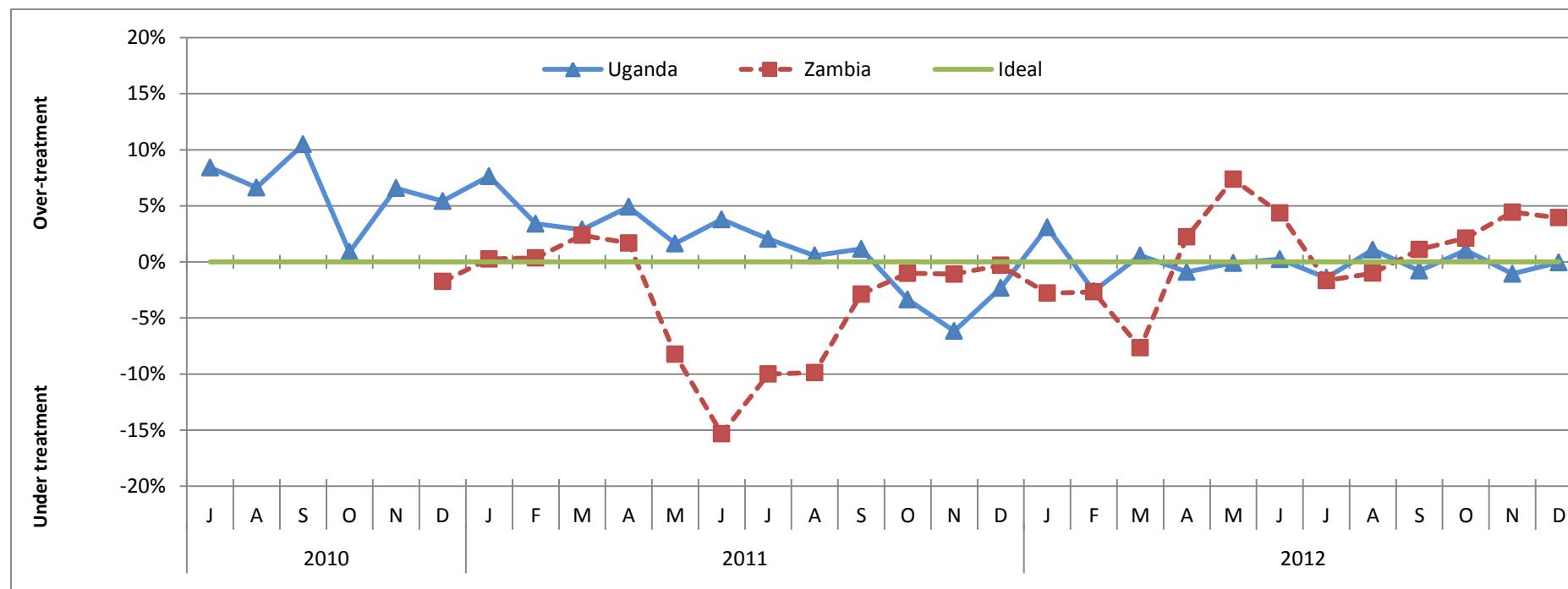


Figure 6: Variation between number of malaria RDT positive results and ACT treatments given

The level of variation in Uganda is very low, while it is more pronounced in Zambia. The main cause for these fluctuations are periods of stock-outs, which links with the observed under-treatment in mid-2011 and lack of understanding following initial training, which fits with the period of over-treatment in the

first half of 2012 when training was being rolled out to the comparator districts. For both countries, it can be seen that over time the level of treatment comes much closer to the ideal of fully following positive mRDT results, which indicates improved consistency and adherence to test results by CHWs.

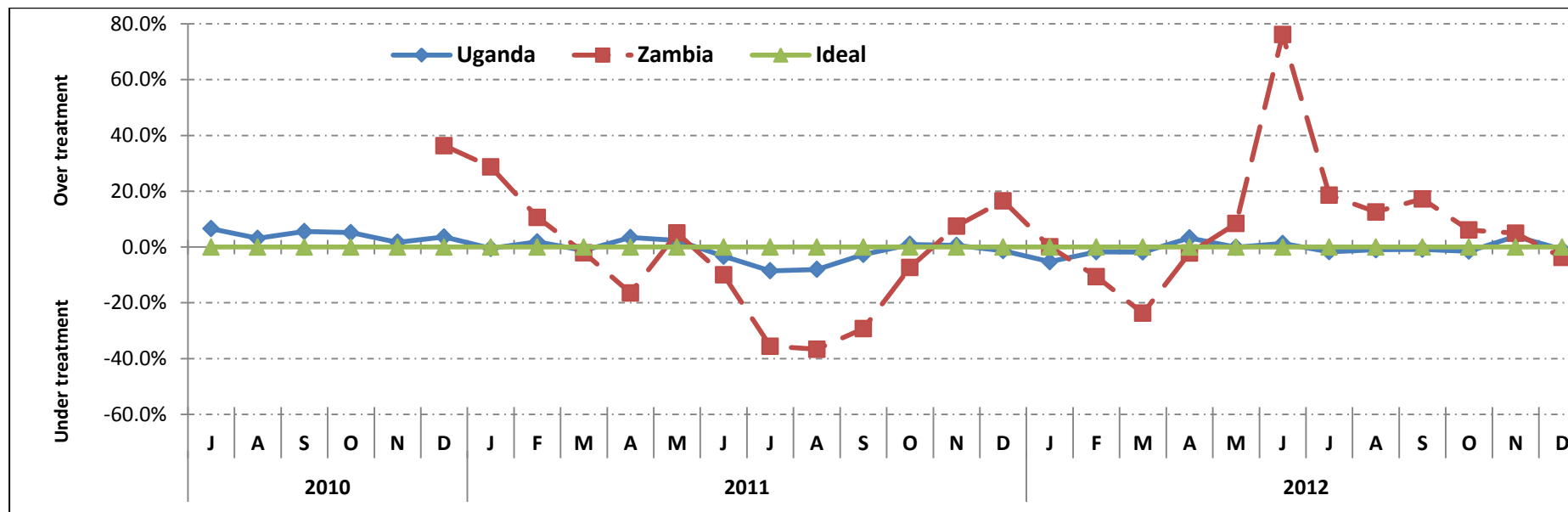


Figure 7: Variation between confirmed fast breathing and amoxicillin treatments given in Uganda and Zambia

When the same is done for the number of pneumonia treatments given compared to the number of reported cases of high respiratory rates, a similar pattern is seen. For Uganda, the level of correlation from the start is remarkably high which would indicate that there was very good understanding among the VHTs of the importance to give amoxicillin only to children with high respiratory rates. In Zambia the fluctuation pattern is very similar to that seen for malaria with the biggest periods for under- and over-treatment being the same. The large spike indicating over-treatment in 2012 suggests that the CHWs were very keen to give amoxicillin to all suspected cases of pneumonia, regardless of respiratory rate. However this drops quickly to come close to the ideal, where both countries are by the end of the reporting period.

It is important to note that for both conditions, the data is grouped, and while the assumption is that they are a good indicator of adherence to treatment guidelines, it is not possible to link them for individual patients. To assess at patient level how much treatment followed positive diagnostic test results, a study was conducted in both countries where a small sample of register entries were studied across different sites. The findings from this study fit well with what is seen from the grouped data. For example, data from Uganda showed that 91 percent of cases with positive mRDT results received ACTs, and for those with fast breathing, 89 percent received amoxicillin. A more detailed account of this study can be found in section 5.3.

Table 13: Commodities procured, stored and distributed by the programme to ICCM providers (by country and year)

	Mozambique			South Sudan			Uganda			Zambia		
	2010	2011	2012	2010	2011	2012	2010	2011	2012	2010	2011	2012
ACTs	N/A	N/A	24,720	4,400	141,129	0	181,516	427,315	360,337	1,500	86,400	65,000
Amoxycillin	N/A	N/A	9,750	3,074	39,613	0	88,120	274,138	254,525	1,200	43,200	65,000
ORS (sachets)	N/A	N/A	123,600	0	0	0	141,475	373,885	219,100	0	0	197,220
Zinc	N/A	N/A	32,960	0	0	0	36,480	119,172	100,047	0	0	111,060
Paracetamol ¹	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	0	13,826
Rectal artesunate	N/A	N/A	N/A	N/A	N/A	N/A	313	2305	4012	N/A	N/A	N/A
mRDTs	N/A	N/A	N/A	N/A	N/A	N/A	63,335	284,455	509,084	1,388	133,437	71,018
Respiratory timers	N/A	165	0	802	0	0	2,710	4,064	0	557	163	612

¹Bottles of 500 tablets

Data source: ICCM project records

Table 13 summarises the quantity of commodities, mainly medicines, procured through the programme. Over time, as implementation capacity increased, there was a corresponding increase in procurement and distribution of these commodities across the countries. In South Sudan, no supplies for diarrhoea were ever received by the project and all procurement and distribution was finished by late 2011. As the programme matured, it became possible to do more accurate calculations of quantities required which were based on actual consumption rates. This enabled larger orders to be placed with phased delivery points in 2011, which greatly reduced the administrative time for procurement. Therefore, many of the quantities procured in 2011 were actually delivered and distributed in 2012.

2.2.8. Total Cases Seen and Treatments Provided

In all countries, CHWs recorded information on the treatments they provided for the presenting sick child. Treatments included ACTs; rectal artesunate as a pre-referral treatment for severe malaria cases (Uganda and Mozambique); amoxycillin across all countries; ORS and zinc in Uganda and Mozambique, as well as in Zambia, after first year of implementation; and paracetamol (in Zambia only). For ACTs and amoxycillin, treatments provided correspond to the number of children treated, as each treatment dose was given per child. For diarrhoea, children treated corresponded only to ORS doses dispensed, as ORS was almost always given with zinc where applicable. As co-morbidities occurred, total treatment doses dispensed did not correspond to the total number of children treated, but rather to the total disease episodes treated.

The scale of services delivered through the programme, in terms of numbers of sick children seen and treatments provided, is summarised in Table 14 below.

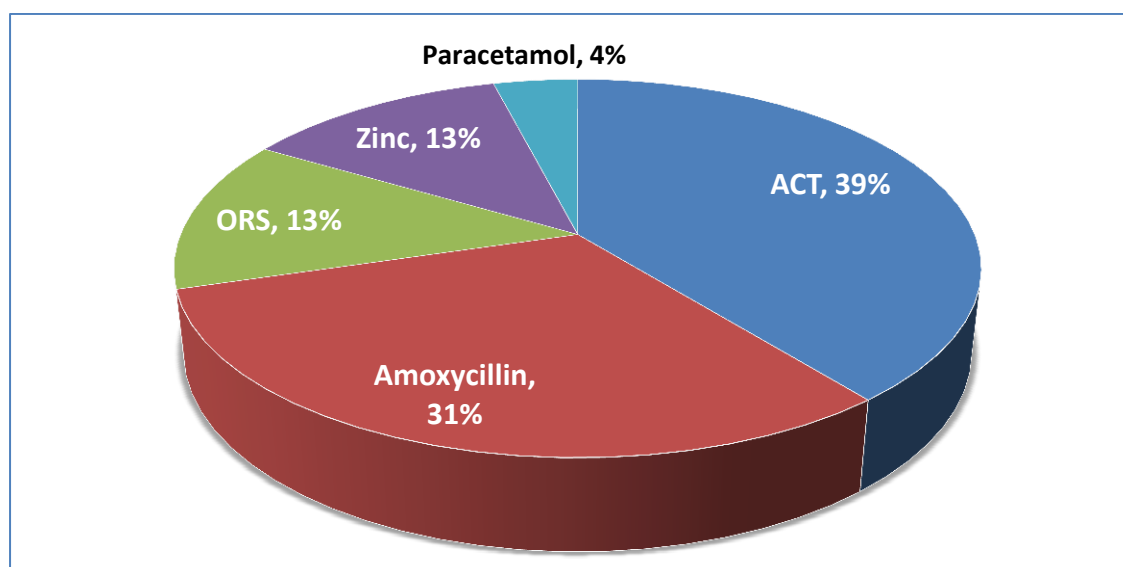
Table 14: Number of children seen and treatments provided through ICCM programme

	Mozambique		South Sudan				Uganda				Zambia				All
	2012	Total	2010	2011	2012	Total	2010	2011	2012	Total	2010	2011	2012	Total	Total
Total children seen ¹	53,572	53,572	7,008	39,958	413	47,379	95,817	486,424	824,101	1,406,342	1,583	158,616	172,979	333,178	1,840,471
<i>Treatment (doses)</i>															
ACTs	11,528	11,528	4,298	25,500	399	30,197	39,370	171,903	398,775	610,048	1,176	102,206	116,501	219,883	871,656
Rectal artesunate	N/A	0	N/A	N/A	N/A		313	2,305	4,012	6,630	N/A	N/A			
Amoxicillin	9,967	9,967	3,074	19,489	169	22,732	46,341	195,335	348,991	590,667	443	31,762	35,416	67,621	690,987
ORS	N/A	0	N/A	N/A	N/A	-	19,330	103,211	129,860	252,401	203	15,863	17,915	33,981	286,382
Zinc	N/A	0	N/A	N/A	N/A	-	17,676	104,436	141,044	263,156	N/A	3,575	10,215	13,790	276,946
Paracetamol	N/A	0	N/A	N/A	N/A	-	N/A	N/A	N/A	-	56	18,913	69,894	88,863	88,863
Total Treatments	21,495	21,495	7,372	44,989	568	52,929	122,717	574,885	1,018,670	1,716,272	1,878	172,319	249,941	424,138	2,214,834

Data source: CHW summary reports collected routinely

¹This includes cases of co-morbidities so can be lower than total number of treatments given and does not distinguish multiple episodes for the same child

During the course of the project, over 1,840,000 children were seen by CHWs (based on data collected from the submitted CHW summary forms). Of these, 79 percent were seen in Uganda, which had the largest scale of implementation. Fifty eight percent of all children were seen in the last project year (2012), while 39 percent were seen in 2011. As already reported in section 5.1.4, for various reasons a proportion of these summary forms were never collected, which means that the amounts given here are underreports of the actual numbers. The scale of ICCM activities increases over time, with the exception of South Sudan, which is a reflection of the increase in size of the programme and an assumable increase in demand for and use of ICCM services within the target populations. A similar number of malaria and pneumonia treatments were given in Uganda, while in Zambia by far the largest treatment given is ACT for malaria.



Data source: CHW summary reports collected routinely

Figure 8: Treatments provided in the programme across all countries

Of all treatments provided, 39 percent were ACTs, 31 percent amoxicillin, while zinc and ORS each contributed 13 percent, as shown in Figure 8. Country-specific proportions of treatments provided are detailed in the country reports in Annex 2.

2.2.9. Referrals and danger signs

In all countries during their initial training, the CHWs are taught how to look for and recognise danger signs of serious illnesses, and to refer these cases immediately to the nearest health facility. They should also refer sick children that have conditions outside of the three diseases that they have been trained to manage. In Uganda and Mozambique, the CHWs are also provided with and trained to use rectal artesunate as a one-off pre-referral treatment for severe malaria.

Table 15: Number of referrals and cases with danger signs

	Mozambique		South Sudan			Uganda			Zambia		
	2010/ 2011	2012	2010	2011	2012	2010	2011	2012	2010	2011	2012
Number of cases											
Referred	N/A	4,000	932	4,562	93	11,079	52,558	77,983	143	29,821	25,281
With danger signs	N/A	0*	345	1,362	9	1,974	8,692	10,976	73	7,425	4,935
Proportion with danger signs	N/A	N/A	37%	30%	10%	18%	17%	14%	51%	25%	20%

The highest number of referrals has been in Uganda. The number increased over time as the scale of implementation increased. However, the relative proportion of cases with danger signs has stayed relatively constant with a small drop-off by 2012. In Zambia, by contrast, the drop in referral numbers in 2012 may be an indication of better understanding in the communities of what services the CHWs provide and therefore they do not bring children with other complaints to the CHW. The proportion of referrals with danger signs also drops in 2012, but is not a significant difference.

2.2.10. Monitoring of behaviour change communication achievements

Two specific tools were developed to monitor the process of community dialogues (CD) so as to monitor and document communities' response to behaviour change communication interventions:

- A Community Dialogue Monitoring Sheet, to be filled after each dialogue held, by the facilitators.
- A Community Dialogue Observation Form, to be filled in by project staff during ad hoc visits. This checklist documents CD proceedings, feedback from participants on the relevance of the approach, as well as feedback from facilitators.

Below is data from monitoring sheets, collected and analysed from a total of 99 CDs and of 30 semi-structured observations from the three countries by the end of December 2012. This data is from approximately half of the implementation districts in each country. These qualitative monitoring and observation visits were carried out jointly with district health authorities and local health centre staff, to encourage local health authorities to listen and respond to communities' concerns, thereby increasing accountability on both sides.

Dialogues were usually attractive to local residents, with an average of 35 participants and up to 120 in a few cases.

"We like these meetings because we meet as a community, and especially us women, we have become one now. We know each other well and we even know those people that are not changing (...) we always use the cards which are the most interesting part because we argue on what is the best for the health of the child." - Kawambwa district, Zambia, November 2012.

Most dialogues were inclusive, conducted with a mixed group comprising care-givers of children, both men and women, of various age groups. In almost all dialogues, local community leaders were consulted for the preparation of the dialogue and at least one participated in the session.

Table 16: Number and gender of participants in a sample of community dialogues, across three countries

	Uganda		Zambia		Mozambique	
	10 Observed CDs	Sample of 27 CDs sheets	12 Observed CDs	Sample of 52 CDs	8 Observed CDs	Sample of 20 CDs
Average no. of participants per dialogue	35	26	32	47	37	49
Range of participant numbers per dialogue	10 - 69		11 - 150		16 - 105	
% of males	45%	45%	47%	32%	25%	35%

According to sample data collected, most of the dialogues generated a general discussion about child health and services available at community level. Malaria is the most common focus, together with diarrhoea, probably because these diseases are common and people are quite knowledgeable and more confident to talk about them rather than pneumonia. Indeed, community-based facilitators reported not feeling knowledgeable enough about the topic of pneumonia.

These dialogues also helped local communities to discuss other underlying factors such as:

- respective roles of men and women in child care;
- the use of traditional herbs at home as the main factor of delayed care-seeking;
- low CHWs' drug stock;
- and poor quality of services and communication at health centre level.

Such dialogues are primarily appreciated because they allow for filling in knowledge gaps and correcting misperceptions.

“I am happy because I always use herbs; but today I learned from my neighbour how to sponge a child with a humid cloth to bring down the fever, and how important it is to see the VHT even before giving our herbs.” - Female CD participant, Kyankwanzi district, Uganda, November 2012



Use of an interactive poster as part of a community dialogue, Zambia

Unlike health sensitisation sessions, CD emphasises questioning and re-evaluating assumptions. While it is usually assumed that running a dialogue requires more facilitation skills, and thus extensive training of community-based facilitators, our experience shows that facilitators managed to apply the participatory methodology, especially when using visual interactive tools. In Zambia, the interactive poster and flash cards were instrumental and unanimously appreciated, both by participants and facilitators; facilitators noted that these materials made the animation of the session easier for them, as participants take ownership of the session and contribute with their story by placing the cards.

“The flash card were really easy to follow even those who were not talking were able to participate by using the cards – it assisted in sharing problems.” - A facilitator, Mwense district, November 2012

What participants seem to appreciate most in these dialogues is the participatory discussion which allows for answering their own concerns. Participants also noted the dialogues gave them an opportunity to learn from their peers, to discuss and agree for collective action, and feel supported in their individual efforts.

“We like these sessions, they assist in knowing things we do not know or we bring issues that we are not sure of for people to assist in finding answers as at times we have nowhere to go, therefore, such gatherings gives us some avenue for asking questions.” - Chiengwe district, Zambia, November 2012.

“I gained the ability to mobilize people of my community to protect themselves against various diseases that affect us, I'll also be able to help my family to avoid diseases that may be caused by a lack of Hygiene, by not using the latrines.” - Participant, Homoine district, Inhambane province, Mozambique, September 2012.

2.1. Impact of programme

As previously described, the impact of this ICCM programme was evaluated through large household surveys, which were conducted both pre- and post- implementation periods in all countries, as well as in comparator areas for three of the four countries. These measured the change over this period of a number of indicators relating to child health included in the programme Monitoring and Evaluation plan, which was agreed with CIDA in the first phase of the grant. These indicators relate to prevalence of the three diseases in children, health-seeking behaviour for children with these diseases, coverage of ICCM, and access to appropriate treatment. In addition, the surveys evaluated impact on under-five mortality using the birth history methodology, except in Mozambique. This approach was complemented by using the Lives Saved Tool (LiST) hosted by Johns Hopkins University for modelling impact on under-five mortality through the ICCM activities. Details of how the surveys were conducted in each country can be found in the country reports in Annex 1. Here the findings across all four of the countries are presented.

One of the key elements to the design for measuring impact was the selection of comparator areas where no such intervention took place to demonstrate the plausibility that any differences could be attributable to ICCM activities. The purposive selection also prioritised areas with the greatest similarity in terms of disease prevalence and urban/rural mix where possible. Data on other characteristics that have been shown to have an impact on child health, such as socio-economic status, were collected as part of the surveys as they could be possible confounders for differences observed with implementation areas. In Zambia, this information was only collected for the comparator areas in the endline survey.

Table 17: Characteristics table for key indicators of intervention and comparator areas in Uganda and Zambia

		UGANDA					ZAMBIA			
Consideration	Indicator	Baseline		Midterm	Endline		Baseline		Endline	
		Interv ¹	Compar ²	Interv	Interv	Compar	Interv	Compar	Interv	Compar
Economic development	Relative wealth index									
	Lowest	23.1		23.8	25.5	19.5	16.1		22.1	15.4
	Second	21.0		19	19.9	18.4	21		25.9	20.2
	Third	18.6		18.1	19	20	18.6		24.7	24.9
	Fourth	23.3		19.4	21	23.4	22.4		16.7	22.3
	Highest	13.0		19.7	14.7	18.7	21.9		10.6	17.2
Immunisation	% of children received DPT3	49	61.1	43.9	54.5	54.6	48.9		71.4	76
	% of children received OPV3	55.8	52.4	50.4	62	64	54.1		75.4	78.5
	% of children received Measles	58.1	82.9	51.8	65.4	68.8	53		80.9	87.9
	% of children with any vaccination	89.3	-	83.8	94.3	92.9	92		93.5	98.1
Maternal education	% women who have attended school	63.2	79.1	61.3	72.2	85	75.6		85.4	86.4
	% of women who have attained ordinary level	12.1	29.7	13.5	15.3	27.9	17.4		15.9	16.7
Nutritional status	% of children with anaemia	45	-	38	31.9	-	-	-	-	-
	% of children with stunting	49.6	-	32	35.9	-	-	-	-	-
Malaria	% of children who slept under an ITN	13.7	57.4	59.6	45.2	44	37.5		57.8	52.3

Consideration	Indicator	UGANDA				ZAMBIA				
		Baseline		Midterm	Endline		Baseline		Endline	
		Interv ¹	Compar ²	Interv	Interv	Compar	Interv	Compar	Interv	Compar
	% of children with malaria appropriately treated with ACTs	15.9	49.3	41.3	59	67.7	51.3		81.8	81.6
	Malaria parasite prevalence	38.7	-	22.7	15.1	-	-	-	-	-

¹ Intervention Area; ² Comparator Area

In Zambia and for Uganda endline, for most of the indicators where there are data, there is a close similarity in both intervention and comparator areas. Immunisation and maternal education figures are generally higher in the comparator area in Uganda, but better matched in Zambia. This difference in intervention and comparator characteristics may help to explain the higher comparator results in Uganda not Zambia for project indicators. The ITN use figures and malaria treatment figures in Uganda suggest there may have been a net distribution and drug re-supply between baseline and midline in the intervention area.

While it is broadly recognised that access to safe drinking water and having a good latrine or toilet can have a positive impact on child health and mortality, data on this was not collected as part of the surveys. Maternal education improved in the Ugandan intervention areas over this period and, in fact, surpassed the level in the comparator areas, while in Zambia, the endline survey demonstrates that they are almost equal in both areas. Data on nutritional status was only collected in Uganda as this was part of the malariometric component, shared with the Pioneer project. In terms of malaria indicators, this shows the biggest change over the period in the intervention areas where the very low levels of mosquito net use and access to appropriate malaria treatment for children at baseline greatly increased in the endline survey. It is likely that the introduction of ICCM in these areas had a positive impact on access to appropriate malaria treatment. It is important to note that in the comparator areas, these levels were much higher at baseline, and the endline findings do not demonstrate the same scale of increase. In fact, for mosquito net use by children, the proportion actually drops.

2.1.1. Two week prevalence of disease

Table 18: Proportion of reported fever amongst children (%) surveyed at baseline and endline in programme implementation sites and comparator

Country	Intervention		Comparator	
	Baseline	Endline	Baseline	Endline
Mozambique	23.2 [19.1,28.0]	27.9 [25.4,30.5]	N/A	N/A
South Sudan	35.3	47.1	N/A	38.7
Uganda	37.5 [32.5,42.8]	30.8 [25.5,36.7]	23.3 [20.1, 26.9]	19.6 [17.4, 22.0]
Zambia	37.6 [31.2,44.4]	37.7 [33.5,42.1]	N/A	36.0 [31.7, 40.5]

In the intervention areas, South Sudan shows an increase in reported fever cases, while Uganda shows a decrease in the intervention areas that is higher than the decrease in the comparator areas. The other countries do not demonstrate any major differences between baseline and endline, and for Zambia, between intervention and comparator at endline. It is important to note that fever prevalence is not being used as an indicator of programme impact, as malaria prevalence is affected more by transmission control measures and climate, and fever has multiple causes. It does, however, show the proportion of the population which may need to seek treatment.

Table 19: Proportion of reported pneumonia amongst cases (%) surveyed at baseline and endline in programme implementation sites and comparator

Country	Intervention		Comparator	
	Baseline	Endline	Baseline	Endline
Mozambique	20.5 [16.6,25.1]	9.5 [8.0,11.1]	N/A	N/A
South Sudan	26.5	31.9	N/A	26.5
Uganda	21.8 [19.1,24.7]	31.5 [29.1,33.9]	18.6 [16.1, 21.4]	15.0 [13.3, 16.8]
Zambia	16.1 [13.5,19.1]	15.6 [13.2,18.4]	N/A	18.7 [16.3, 21.2]

While there are differences between the proportion of reported pneumonia cases between baseline and endline surveys in the intervention areas, these are unlikely to indicate a significant trend as historically prevalence of reported pneumonia has high variation from one data source to another. An important finding is the much higher pneumonia reports in Uganda intervention areas compared to comparator in both baseline and endline surveys. Again, no real differences were seen in Zambia between baseline and endline and between intervention and comparator areas. Again, this is not an indicator of impact.

Table 20: Proportion of reported diarrhoea amongst children (%) surveyed at baseline and endline in programme implementation sites and comparator

Country	Intervention		Comparator	
	Baseline	Endline	Baseline	Endline
Mozambique	9.9 [7.9,12.4]	10.5 [8.9,12.5]	N/A	N/A
South Sudan	17.8	43.3	N/A	35.1
Uganda	16.9 [14.4,19.7]	14.8 [12.8,17.1]	N/A	7.3 [6.1, 8.7]
Zambia	17.5 [14.7,20.7]	14.7 [11.6,18.4]	N/A	16.3 [14.0, 19.0]

Again, for diarrhoea the prevalence levels in Uganda intervention areas are much higher than that recorded for comparator areas, twice as much at endline. In Zambia, the intervention and comparator are almost equal at endline.

2.1.2. Treatment-seeking behaviour

Improvements were seen in the proportion of caregivers who sought treatment from any source (CHW, public facility, private sector) for sick children across all countries between baseline and endline. In Mozambique, the difference was minimal, but this is likely linked to the late start of ICCM implementation.

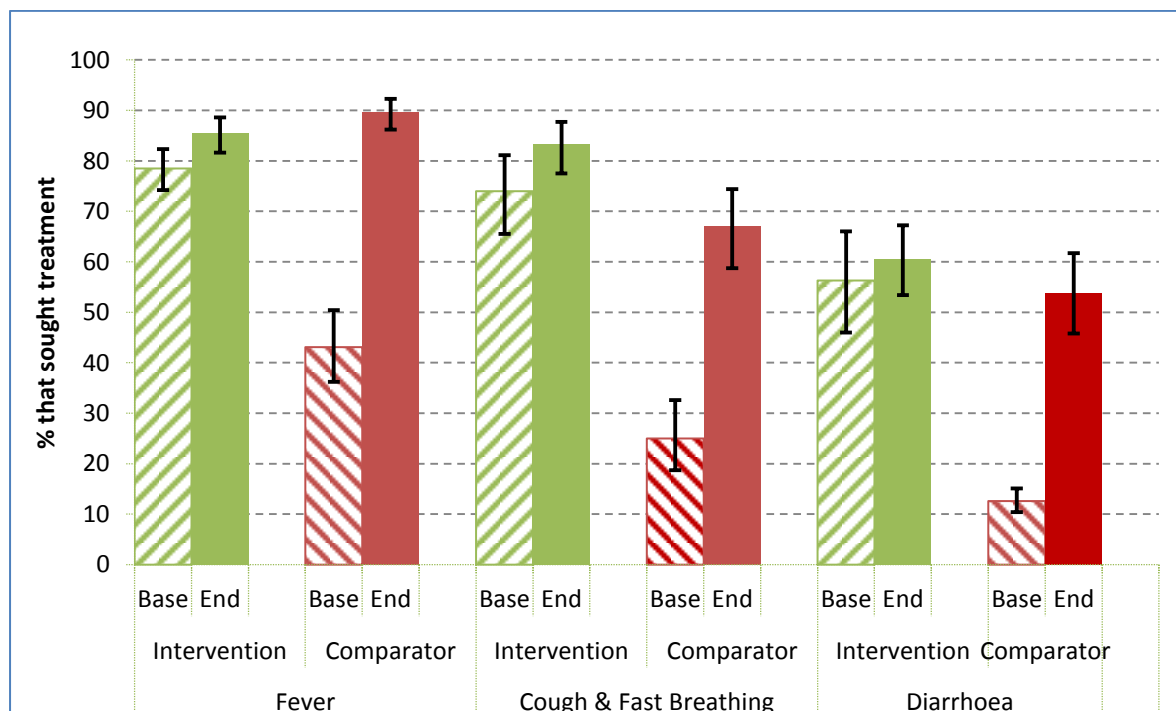


Figure 9: Percentage of sick children who sought treatment in Uganda

The baseline level for treatment-seeking behaviour was already high in Uganda for fever and fast breathing in the intervention areas, and this increased slightly by endline, as did treatment-seeking

for diarrhoea – see Figure 9. However, in the comparator areas the levels of treatment seeking behaviour at baseline are much lower for all three conditions, but show a large increase in the endline survey, much more than in the intervention areas. It is difficult to identify a specific cause for this difference but it has been documented that there are more partners implementing health projects being implemented in the comparator districts compared to the intervention ones.

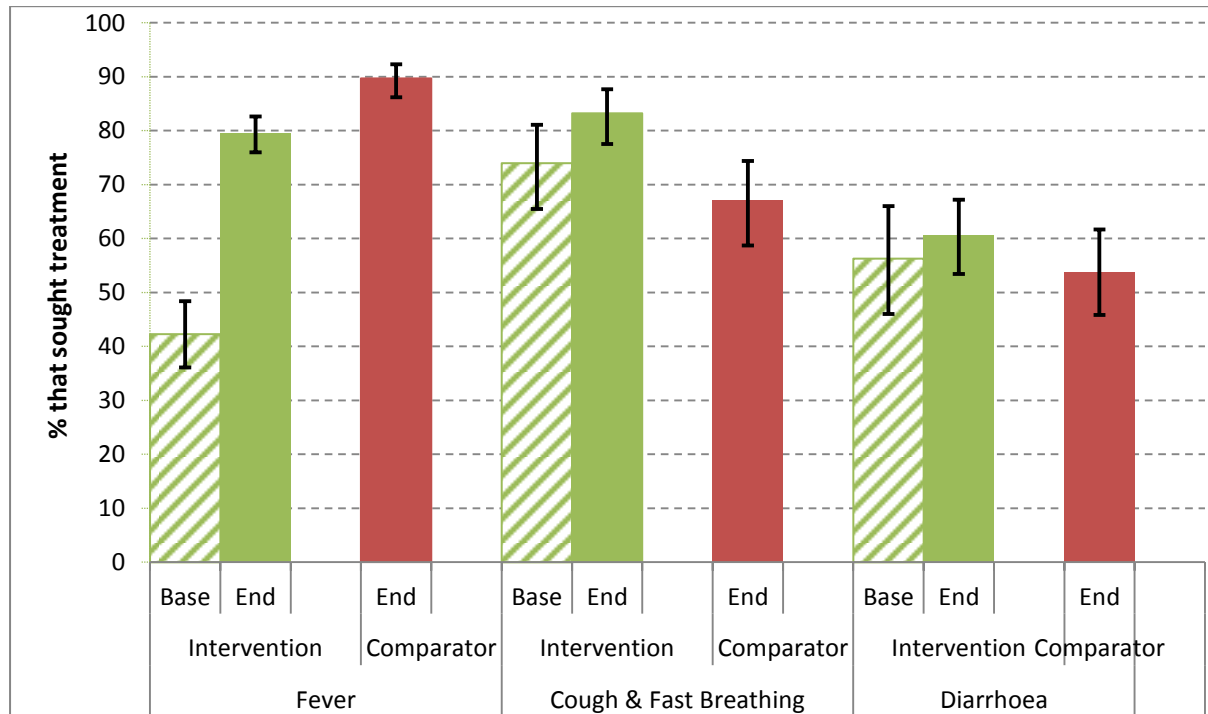


Figure 10: Percentage of sick children who sought treatment in South Sudan

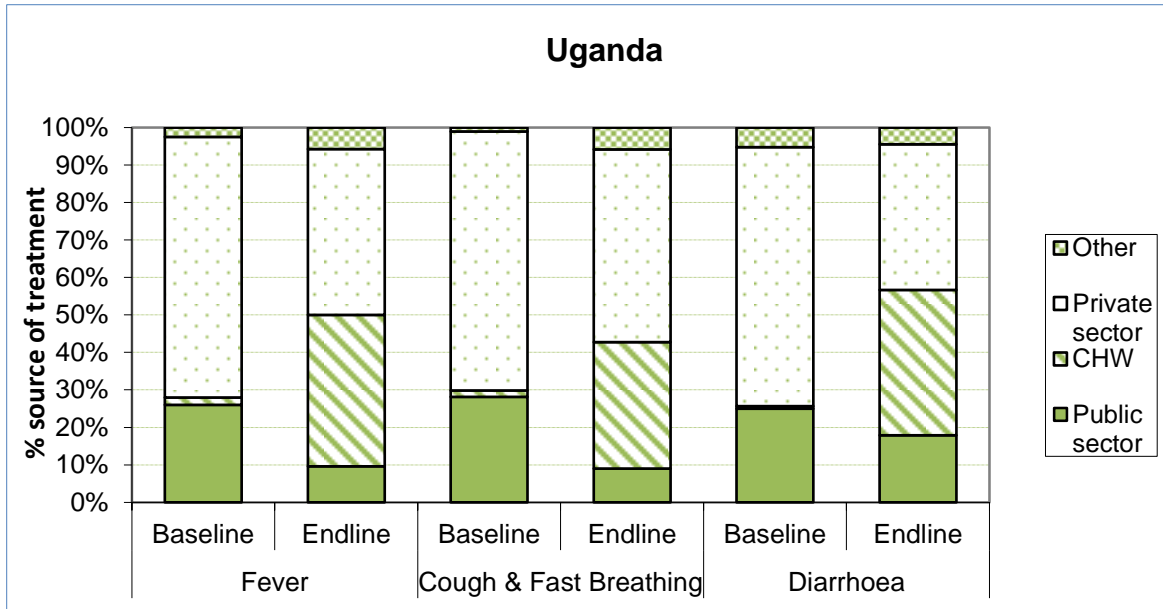
In South Sudan, there was a large increase in the proportion seeking treatment for fever in children from baseline when it was very low at 42 percent, to almost double at endline (79 percent). The treatment-seeking behaviour for cough and fast breathing was already high, 73 percent at baseline and increased by less than 10 percent at endline to 82 percent.

In Zambia, the levels of treatment seeking behaviour in the intervention areas at baseline are already quite high, especially for children with fever (73 percent), but they demonstrate a larger increase in the endline than seen in Uganda. For fever and suspected pneumonia, they increase to 91 percent while for diarrhoea they go from 60 percent up to 82 percent by the endline. The endline levels for the intervention areas are almost the same as for the comparator areas.

2.1.3. Source of treatment

In both Mozambique and South Sudan, the first point of contact for seeking treatment remains the public health service for all three conditions, standing at above 80 percent and 70 percent respectively at baseline. While there were small increases in use of CHWs for these conditions at endline, use of the public health facilities did not drop below 70 percent in Mozambique and 58 percent in South Sudan. In Mozambique, there has historically been a very high usage of MoH facilities and the APes programme is meant to cover the gap for those that do not go there – the private sector is not very developed. For South Sudan, there is a private sector for health, but it was just growing during the period of implementation and was weakened by the difficulties in security. Access was also limited due to poor infrastructure.

“Public sector” in Figures 11 and 12 relates to MoH health facilities, while “private sector” includes drug shops, traditional healers, NGO facilities, private for-profit facilities and pharmacies. The “other” category applies to traditional healers and herbalists.



Data Source: Project Survey data

Figure 11: First point of contact for seeking treatment for children under five in Uganda

For Uganda, by contrast, in the mid-west region the CIDA ICCM project appears to have greatly affected caregivers’ healthcare-seeking behaviour, resulting in an increased number of children seen by VHTs, as opposed to private facilities, which are less regulated and where they have to pay, as seen from the findings of the endline survey. Plausible reasons for this trend include easy access to free services, perceived value of diagnosis, quality of care, and the feeling of community ownership of the project. We interpret the results with caution in terms of improvement to access to better care, as private includes not-for-profit NGO facilities, where there may be less concern on lower quality; it would be interesting in future to look separately at private for profit and NGO services. The impact on use of public sector facilities as a proportion (though not necessarily in terms of absolute numbers) looks greater for fever and cough & fast breathing than the impact on private sector, whilst for diarrhoea there is a greater reduction in proportion from the private sector.

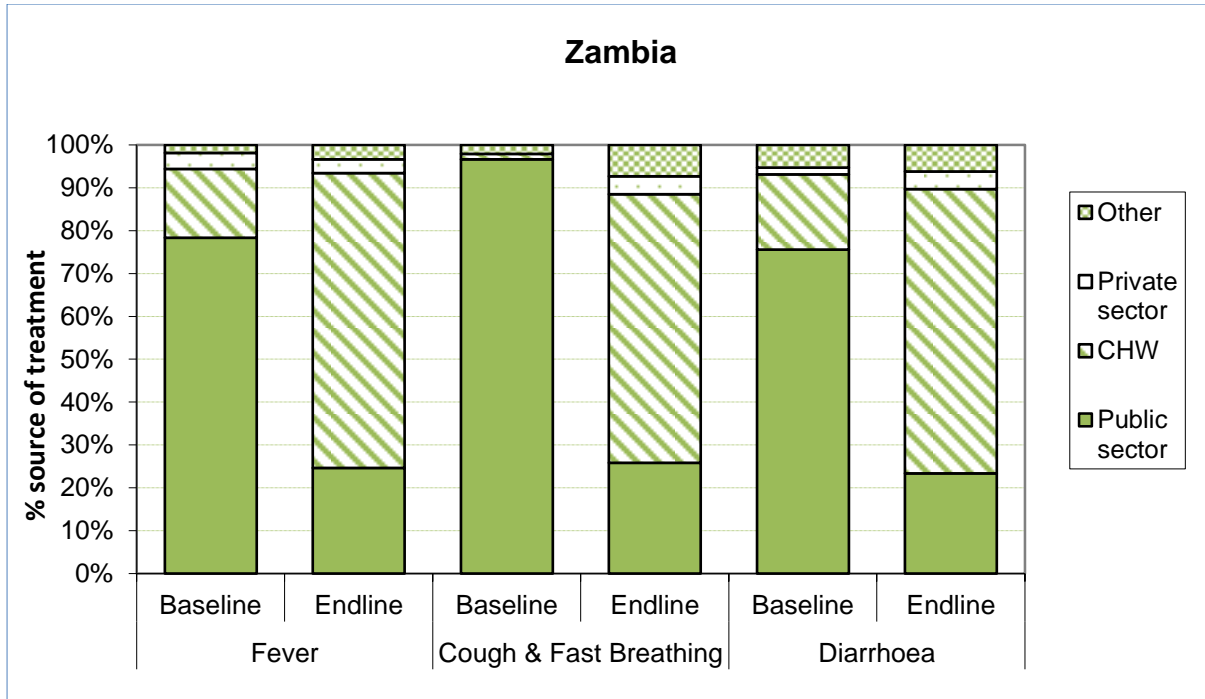


Figure 12: First point of contact for seeking treatment for children for all three diseases in Zambia

In Zambia, where there is little private sector health provision, the comparison between the baseline and endline survey results showed that the choice of care-seeking shifted from public sector facilities at baseline (when CHW operations were non-existent) to CHWs during the course of project implementation. This increase in CHW usage comes with a reduction in usage of public health facilities, which would fit with the model of ICCM being the first source for treatment of uncomplicated childhood illnesses and reflects a high level of appreciation and trust in the CHWs by the communities they serve.

2.1.4. Received appropriate treatment

Data collected on appropriate treatment for the three conditions during the surveys does not relate the treatment to a confirmed diagnosis in the cases of malaria and pneumonia. Appropriate treatment for fever is defined as receiving an ACT, for cough and fast breathing it is defined as receiving an antibiotic, and for diarrhoea it is receiving ORS. As such, it serves as a useful indicator of the quality of care delivered for sick children.

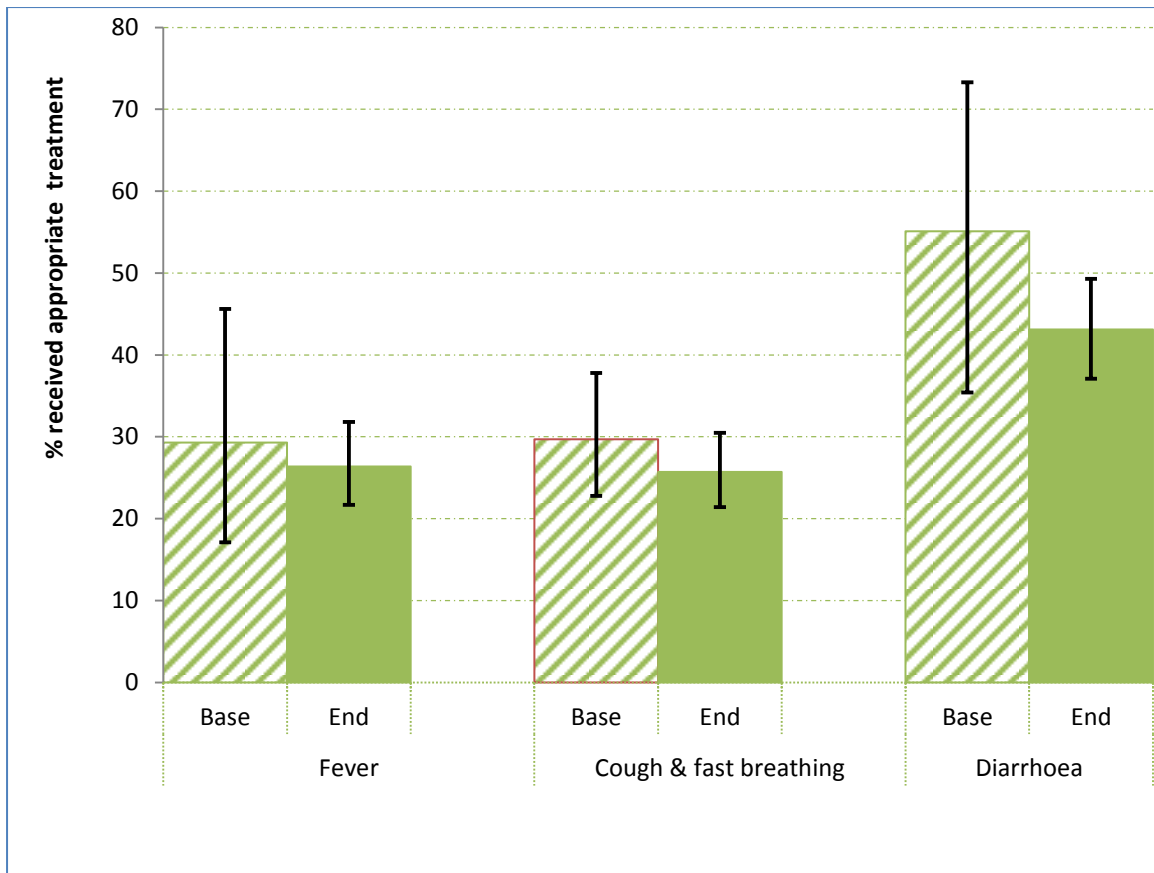


Figure 13: Reported percentage of children that received appropriate treatment in Mozambique (intervention only)

The level of appropriate care in Mozambique intervention areas was low at baseline for both fever and suspected pneumonia, and actually dropped slightly in the endline. Interestingly, for diarrhoea the baseline level was much higher – which is linked to a good supply of ORS at health facilities and with APEs. The drop is mainly due to issues with medicine supplies in public health facilities and the fact that, while the APEs programme was being revised, the supplies of kits of the existing APEs experienced many ruptures in supply.

For South Sudan there were large increases between the low levels at baseline and much higher levels seen at endline in the intervention areas. The levels more than doubled for fever (from 26 percent to 59 percent) and for cases of cough and fast breathing (36 percent to 72 percent) and relate to an increased availability of ACTs and antibiotics, much of which were delivered through the ICCM project. The levels seen at endline are very similar to those recorded in the comparator areas at endline.

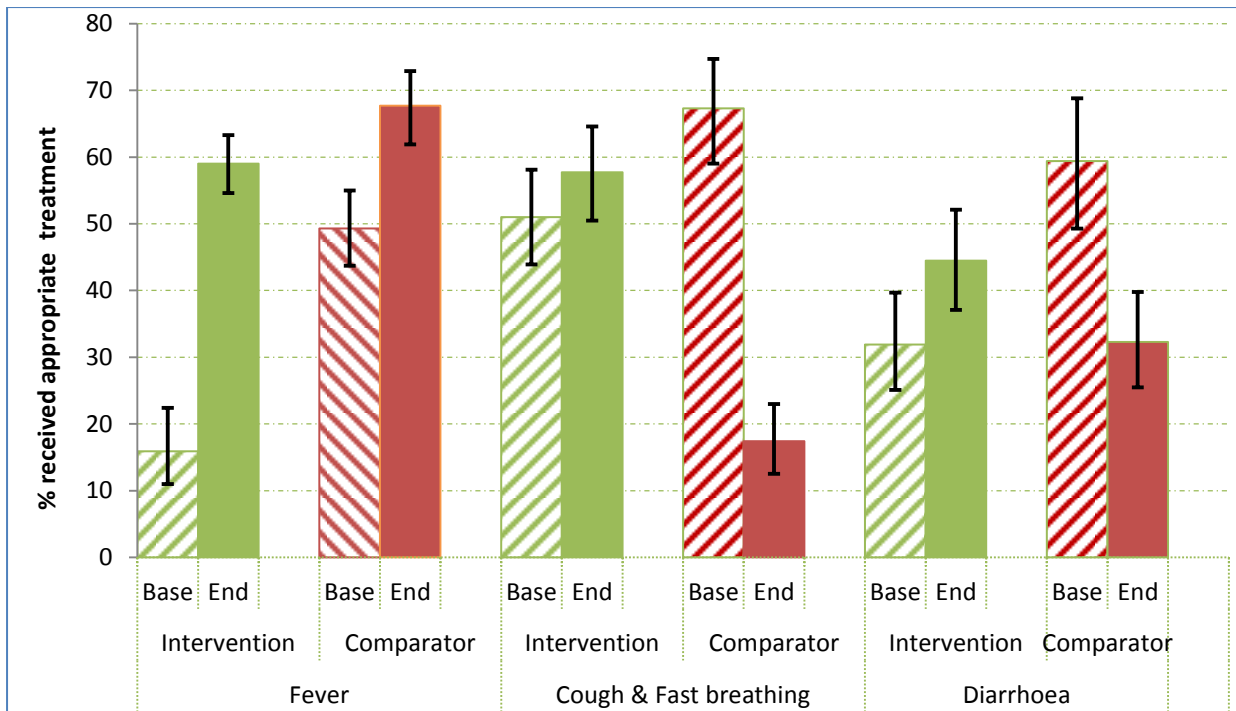


Figure 14: Reported percentage of children that received appropriate treatment in Uganda

The large increase in Uganda in the level of appropriate treatment for fever in the intervention areas at endline is directly linked to the increased availability of ACTs through ICCM. The comparator areas show very different trends with fever being the only condition to show an increase. The very large drop for appropriate treatment, for suspected pneumonia in particular, is believed to be linked to issues with supplies of antibiotics within the public sector.

For Zambia there was also an increase in receiving appropriate treatment for all three conditions between the baseline and endline in the intervention areas. The level for appropriate treatment for fever and for cough and fast breathing was around 50 percent at baseline, increasing to 82 percent by endline. These endline levels were almost identical to levels for appropriate treatment found in the comparator areas at endline.

2.1.5. Timing of treatment

The proportion of caregivers seeking treatment within 24 hours of onset of symptoms is an important indicator for ICCM programmes as one of the key reasons for such an intervention is to increase access to timely treatment for childhood illnesses. This particularly applies to cases of fever and suspected pneumonia, where promptness of treatment is critical.

The proportion of sick children brought for treatment within 24 hours in Mozambique, while greatly increasing over time, remains very low at below 15 percent at endline for fever, cough, and fast breathing. In South Sudan, while the increase was greater, it still remained low at 17 percent for fever and 24 percent for cough and fast breathing at endline in the intervention areas – which was almost equal to the levels in the comparator areas.

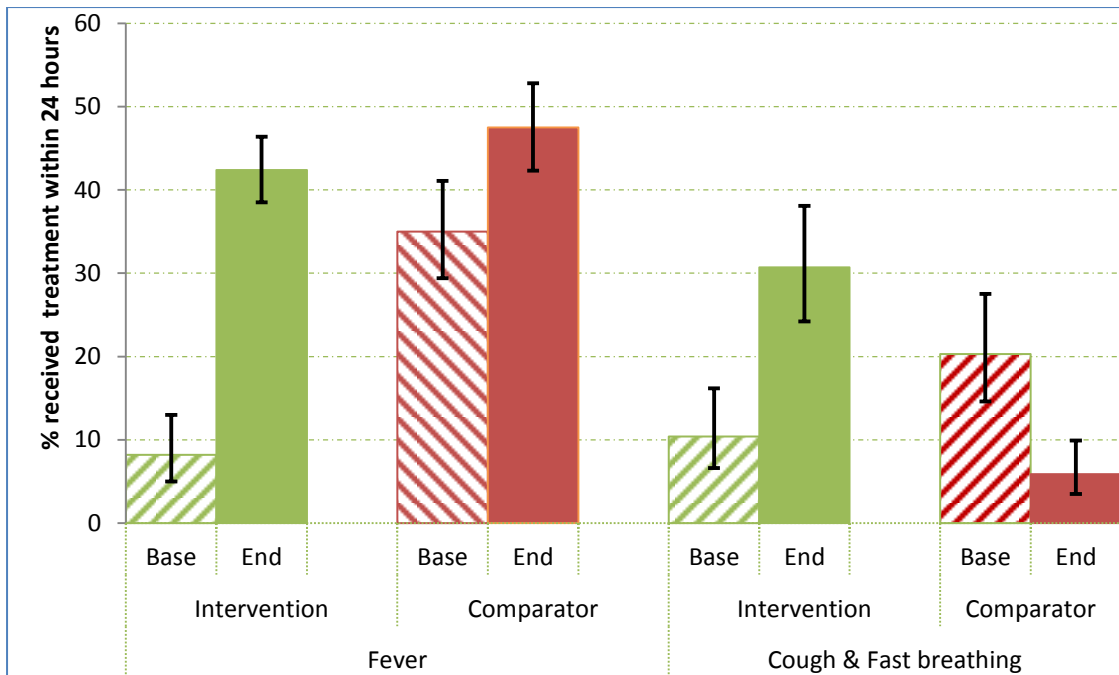


Figure 15: Treatment received within 24 hours for children with fever or suspected pneumonia in Uganda

The large increases in timely treatment-seeking for both conditions in Uganda over time in the intervention areas are impressive, and show the influence of the BCC activities being conducted as part of the ICCM project. In the comparator areas, the drop in timely treatment for cough and fast breathing is notable, but the cause is not known. Zambia shows similar changes, though to a lesser extent, and again, the intervention levels at endline are very similar to those in the comparator areas.


2.1.6. Impact on under-five mortality

Implementation of ICCM was staggered and by the time the endline survey was conducted, implementation had been in place in Uganda for two years, compared to 22 and 18 months in the intervention areas in Zambia and South Sudan, and seven months in the comparator areas in Zambia (where implementation started later as per the design of the programme).

For this reason, mortality rates were derived from birth history data collected during the endline survey and were calculated over a Pre-implementation and Implementation phase, specific to each area. This comparison of before and after rates allows, in the case of the intervention area, an evaluation of adequacy (i.e. has target of reduction been achieved). For the comparator areas, it gives an indication of the level of changes in the absence of implementation. A further comparison was done using the birth history data collected in the baseline survey in Uganda (Table 22). Here, rates were calculated over two periods - 0-2 and 3-4 years prior to baseline survey. Again this gives an understanding of the changes in rates prior to any implementation of ICCM in the area.

Table 21: Childhood mortality rates in Intervention Areas: Uganda and Zambia

Selection Period	Uganda Intervention Endline		Zambia Intervention Endline		Zambia Comparator Endline	
	Survey Period Oct-Nov 2012		Survey Period Sep – Nov 2012		Survey Period Sep – Nov 2012	
Period of analysis	Sep-2008 to Aug-2010	Sep-2010 to Sep-2012	Nov 2008 to Sep 2010	Oct 2010 to Aug 2012	Jun 2011 to Jan 2012	Feb 2012 to Sep 2012
Infant mortality rate (IMR)	52.8 (36.8- 68.4)	51.3 (35.9- 66.5)	67.1 (53.9- 80.2)	60.4 (47.6- 73.0)	48.4 (29.8- 66.6)	55.9 (36.3- 75.0)
Under 5 mortality rate (U5MR)	86.5 (63.5- 109.0)	76.7 (56.5- 96.4)	127.5 (110.2- 144.4)	100.2 (84.5- 115.7)	84.7 (63.8- 105.1)	77.7 (56.8- 98.2)

 Pre-Implementation


 Implementation Phase

Table 22: Childhood mortality rates in Comparator Areas: Uganda

Selection Period	Uganda Intervention Baseline Survey Period		Uganda Comparator Endline Survey Period	
	Oct-Nov 2009		Nov 2012 – Feb 2013	
Period of analysis	Sep-2005 to Aug-2007	Sep-2007 to Sep-2009	Sep-2008 to Aug-2010	Sep-2010 to Sep-2012
Infant mortality rate (IMR)	60.6 (33.2- 87.0)	50.8 (30.8- 70.5)	73.1 (52.9- 92.8)	37.3 (23.5- 50.8)
Under 5 mortality rate (U5MR) (deaths/1,000 live births)	89.3 (59.5- 118.1)	81.2 (56.5- 105.3)	85.9 (63.3- 108.0)	50.0 (34.0- 65.8)

Within the intervention areas for Uganda and Zambia and also the Zambia comparator areas (Table 21), the before and after comparison shows a decrease in under-five mortality rates (U5MRs) over time. The largest reduction was observed in the Zambia intervention areas where U5MRs decreased from 127.5 to 100.0 per 1,000 live births. Infant mortality rates also show a decrease. The largest decrease is again in the Zambia intervention areas. The exception to the rule is in the Zambian comparator area where an increase is observed in IMR from 48.4 to 55.9 deaths per 1,000 live births.

Within the comparator areas in Uganda, large reductions are observed in both infant and under-five mortality rates (Table 22). These changes are greater than the changes observed in the intervention areas and further work is required to understand why this may be the case.

Rates calculated using data from the baseline survey in Uganda (Table 22, Column: Uganda Intervention Baseline) within the intervention district show similar reduction in U5MR. IMR, on the other hand, shows a larger decrease in the years preceding the intervention from 60.6 to 50.8 deaths per 1,000 live births over the period September 2005 to September 2009 than during the intervention.

There is evidence that IMR and U5MR rates decrease over time and there is variation across countries. In Uganda, the evidence points to a reduction in IMR prior to implementation of ICCM, and for U5MR, a sustained decline during implementation. In Zambia, reduction in mortality rates in both intervention areas is seen, and there is some evidence for U5MR that shows the degree of reduction is related to duration of the intervention.

In South Sudan, the endline survey was conducted jointly with Save the Children and IRC and the analysis conducted by an external consultant recruited on behalf of the partners.

Table 23: South Sudan endline Under 5 Mortality Rate data

	« Pre-Implementation »			« Post-Implementation »		
	Period of Analysis 10/2008 - 12/2009			Period of Analysis 10/2010 - 12/2011		
	Number of deaths ¹	Person Years	U5MR (95% CI) (deaths/1,000 live births)	Number of deaths	Person Years	U5MR (95% CI) (deaths/1,000 live births)
Intervention Area						
<i>Original data</i>			40.9 (25.0 – 56.7)			31.5 (15.3 – 47.8)
Imputing missing month of birth	29.5	4445.5	51.8 (31.9- 71.3)	22.5	4249	41.2 (19.9- 62.0)
Excluding AD team	20	3379.5	46.7 (24.5- 68.4)	16	3325	37.8 (12.2- 62.7)
Excluding AD team and imputing missing month of birth	25	3547	54.7 (31.3 - 77.6)	17.5	3443	39.9 (15.3- 63.8)
Comparator Area						
<i>Original data</i>			36.8 (21.9-51.6)			35.5 (19.7-51.4)
Imputing missing month of birth	22.5	4815	37.0 (20.5 - 53.2)	24	4384	42.3 (24.0- 60.2)
Excluding AD team	11.5	3749	24.0 (8.6- 39.2)	14.5	3499.5	32.0 (12.3- 51.3)
Excluding AD team & imputing missing month of birth	16	3828	32.5 (14.4- 50.2)	17.5	3551.5	37.9 (17.2- 58.1)

The results have shown a surprisingly low mortality rate, which necessitated further investigation to understand the causes – the detailed findings are shared in a separate briefing note and summarised here in Table 23. It is recognised that conducting a large survey in a location with poor security has impacted on the data collected. For both the intervention and comparator areas, the original U5MR is given in italics and the subsequent adjustments based on further review of the questionnaires are presented.

While the U5MR still remains well below what would be expected for an environment such as South Sudan, in the intervention areas there is a clear trend showing a reduction over the ICCM implementation period. The original analysis has shown a reduction of 9.4% and in the subsequent analysis following a review of the data this difference becomes greater at 14.8%. By contrast in the comparator areas the difference between baseline and endline is minimal in the original analysis and in the revised calculations actually increases by 5.4% during the same period. We are very keen to make the data available to international experts for further scrutiny and

2.1.7. Lives Saved (including LiST projections)

Lives Saved Tool (LiST) is part of a compendium of modelling modules (SPECTRUM) that aid projection of impact of existing interventions. LiST focuses on modelling potential impact on under-five mortality and is hosted and managed by Johns Hopkins University. The LiST software models changes in child survival based on changes of coverage of child health interventions. It works by specifying the current demographic projections for under five and maternal mortality based on available data for the country or region in question. By inputting data from the ICCM projects, which detail the interventions and using coverage data from the surveys, it is possible to model the impact of the ICCM programme on under five mortality rates. These values can be for the period of implementation and also projected for a number of years beyond this period to show what impact can be achieved if the intervention activities are sustained.

The LiST modelling on this programme which is presented below, used the following assumptions:

Non-ICCM areas: Default low LiST rates at baseline increase to observed CIDA-ICCM project baseline coverage in 2012 and by same trend after 2012.

ICCM areas: CIDA-ICCM project baseline coverage increases to the observed rate in 2012, and that the same trend continues after 2012

In Mozambique, as our implementation period there was quite short, we used coverage data from the Save the Children ICCM project, also CIDA-funded, which has a longer period of implementation.

1. Uganda							
Indicator	Implementation period				Projections		
	2009	2010	2011	2012	2013	2014	2015
U5 Mortality rate	100	96	90	86	79	75	72
Lives saved (1-59 months)	0	151	297	439	574	614	629
	% deaths averted				7%		

2. Zambia							
Indicator	Implementation period				Projections		
	2009	2010	2011	2012	2013	2014	2015
U5 Mortality rate	102	96	88	81	75	73	72
Lives saved (1-59 months)	0	103	207	317	430	479	409
	% deaths averted				12%		

3. Mozambique							
Indicator	Implementation period				Projections		
	2009	2010	2011	2012	2013	2014	2015
U5 Mortality rate	117	111	104	97	91	87	84
Lives saved (1-59 months)	0	139	278	418	555	656	612
% deaths averted	5%				9%		

4. South Sudan							
Indicator	Implementation period				Projections		
	2009	2010	2011	2012	2013	2014	2015
U5 Mortality rate	91	88	85	80	77	74	71
Lives saved (1-59 months)	0	57	117	166	222	254	255
% deaths averted	5%				9%		

The findings indicate a sustained reduction in U5MR both during the period of implementation which continues in the projections to 2015. In the later years the rate starts to plateau as another assumption is that the interventions for the different diseases will peak at 90%. The baseline mortality rates for Uganda and Zambia are very similar as is the change seen in U5MR over the period modelled although in Zambia the % of deaths averted is higher. In Mozambique the U5MR at baseline is the highest of all 4 countries with a similar trend in reduction seen over the same period. Perhaps the most surprising finding is the baseline U5MR given for South Sudan which is clearly lower than the other 3 countries which would not necessarily be expected for this post-conflict context with very poor infrastructure and a very weak public health service. The impact on U5MR is however within the range seen in the other countries for the same period.

This LiST modelling demonstrates that the ICCM intervention has a measurable impact on U5MR in the 4 different contexts and that this rate of reduction would be sustained if the ICCM interventions were sustained in future years.

2.1. Operational Research

This programme provided the opportunity to conduct operational research within the context of ICCM service delivery to investigate key areas which require better understanding and knowledge in order to deliver a more effective service. The findings from this research can be used by policy makers and implementers to further inform and improve their delivery models. A number of studies were conducted. However, one planned assessment of the feasibility and acceptability of mRDT use by CDDs in South Sudan could not be conducted due to the early close of the project for security reasons. For the studies in which the analysis is ongoing, preliminary results are shared below, and the final reports will be shared as soon as completed.

2.1.1. OR I: Diagnosis and treatment of malaria and pneumonia through ICCM in Uganda and Zambia

The overall aim of this study was to document the diagnoses and treatments prescribed to children under five by CHWs trained in ICCM in Uganda and Zambia under routine conditions, in order to draw conclusions for best practices in integrated community case management initiatives. Data collection was done through observation of CHW completed registers and was conducted mainly in the first three months of 2013.

The specific objectives were:

- i. To establish and compare the proportion of children diagnosed with malaria, pneumonia, and diarrhoea, and the treatments prescribed by CHWs for these conditions following implementation of ICCM with/without mRDTs (comparison of two ICCM project areas in Uganda)
- ii. To establish and compare the proportion of children with fever and negative mRDT who receive antibiotics in areas where the treatment algorithm includes/does not include paracetamol (Uganda vs Zambia ICCM implementation models)
- iii. To establish the proportion of children seen by CHWs who received an appropriate treatment based on documented age, symptoms observed, and test results (two ICCM projects in Uganda and ICCM in Zambia)

In Uganda, 95 VHTs were randomly selected from five of the ICCM districts, and in Zambia, 61 CHWs were randomly sampled from 41 health centre catchment areas where ICCM was being implemented. Copies of the patient registers were collected, entered and analysed for diagnoses given and treatments prescribed.

Preliminary results are based on a total of 15,470 sick child consultations documented from Uganda and 1,444 from Zambia. In Uganda, 67 percent of children had a fever diagnosis, 52 percent malaria, 44 percent pneumonia and 14 percent diarrhoea. Seventy eight percent of fevers were positive for malaria as per the mRDT. Of the children with non-malaria febrile illness (NMFI), 46 percent were diagnosed with pneumonia, of which the majority received amoxicillin. In Zambia, 87.2 percent of children had a fever diagnosis, 67 percent malaria, 18 percent pneumonia, and 17 percent diarrhoea. Seventy seven percent of the fevers in Zambia were malaria positive. Of the children with NMFI in Zambia, significantly fewer were diagnosed with pneumonia (26 percent; $p < 0.0001$) and instead of antibiotics, the majority received paracetamol and diarrhoea treatment.

These interim results indicate that using mRDTs in ICCM reduced antimalarial prescription by 22–23 percent and most likely improved the detection of NMFI, such as pneumonia. Including paracetamol in the ICCM algorithm can reduce the prescription of antibiotics for NMFI.

Full analysis of the data is currently underway and the final research report is due to be completed in September 2013.

2.1.2. OR II: Quality of care

2.1.1.1. Zambia's CHW performance in diagnosing and treating pneumonia

With additional funding and support from COMDIS HSD (a DFID-supported research programme consortium, of which Malaria Consortium is a partner), the project conducted an operational research study titled "A study of Community Case Management of Pneumonia in Zambia: Factors Which Determine Rational Use of Antibiotics". This was a cross-sectional study using both quantitative and qualitative methods to provide valuable evidence on the rational use of antibiotics at the community level by both the CHW and the caregiver. The currently available evidence is limited and although interventions such as ICCM have great potential to reduce the burden of pneumonia, especially in hard-to-reach populations, the threat posed by increasing levels of antibiotic resistance remains an underlying concern. It is hoped that the study will inform action (especially in Zambia and other countries implementing ICCM) to combat resistance and ensure the continued effectiveness of medicines to treat simple pneumonia, whilst continuing to provide community-level treatment for a major cause of child mortality.

The study had the following six objectives:

1. To determine if CHWs are able to use respiratory timers accurately to identify pneumonia in a child;
2. To determine if community health workers adhere to ICCM guidelines in prescribing antibiotics for children;
3. To determine if CHWs are able to correctly identify danger signs in children less than five years old;
4. To determine factors that influence CHWs' antibiotic prescribing behaviours for children;
5. To look at adherence to treatment regimens by carers and what factors promote good adherence;
6. To examine the behaviour and attitudes of community members when CHWs do not prescribe any medication for their ill child.

These objectives were achieved through three study components:

- a) Observation of CHW consultations to determine if CHWs correctly identify, test and prescribe for suspected pneumonia patients (objectives 1, 2 and 3);
- b) Follow-up of all caregivers whose children were prescribed antibiotics during the observation period to determine adherence (objective 5);
- c) Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs) with CHWs and caregivers to determine influences on rational prescribing and the behaviours and attitudes of the community (objectives 4 and 6).

Data collection and entry were conducted from September 2012 to January 2013. Data is being analysed with the study report due to be finalised by October 2013.

Preliminary findings from the study indicate the following:

- No significant difference was found between expert and CHW respiratory counts
- Strong agreement was found between CHW and expert classification of fast breathing
- The majority of children were correctly prescribed antibiotics – according to CHW classification 84.2 percent of children requiring antibiotics received them. When compared to expert classification, 75.3 percent of children with fast breathing received antibiotics.
- Inappropriate use of antibiotics was minimal, with 78 percent of children receiving appropriate treatment for their condition, according to expert assessment of fast breathing. Only 14.3 percent of children incorrectly received antibiotics for their condition.

These results indicate the Sick Child Job Aid is a trusted guide for both the CHW and the caregiver and appears to indicate quality of care. Interpersonal communication skills are the key drivers of caregiver satisfaction and have a positive impact on CHWs' clinical skills. This indicates that a joint focus during initial training and ongoing support of CHWs on interpersonal communication and clinical skills can improve overall quality of care through ICCM. The study report is currently in draft form and due to be finalised in September 2013.

The limitations of this study include the possible influence on CHW behaviour by being observed during consultations, known as the Hawthorne effect - this was offset by ensuring the same observer stayed with each CHW for a period of time and the first observation was not included in the analysis. Other limitations include the small number of consultations observed and the potential subjectivity of observers for gauging interpersonal communication skills of CHWs.

2.1.2. OR III: Mobile phone pilot

Operational research was undertaken on the use of mobile phones for routine reporting by VHTs in Uganda. By March 2011 in Uganda, the project had achieved the full target of VHTs trained in phone-based reporting and distributed 250 phones to VHTs and their supervisors in two districts. After roughly 12 months of use by VHTs, an evaluation of this phone pilot was conducted in September 2011 using both quantitative and qualitative methods. Preliminary results indicated very significant advantages (e.g. timely submission of high quality data and improved motivation of the VHTs to offer services). Focus group discussions conducted with VHT users and with supervisors showed an overwhelming appreciation for mobile phone reporting, despite several hardware, network, and utilisation challenges. However, over time, results showed a decline in reporting rates which was mainly due to non-functionality of the phones or network system failures. Much time was invested by the project team to resolve these issues with the network provider, but without significant success. Phone functionality was hampered by wear and tear of the phone accessories (i.e. batteries and solar chargers) and by loss of the phones. Furthermore, the phone-based reporting system seemed to contribute to increasing VHTs' satisfaction, while slightly undermining the role of supervisors, as they did not have opportunities to reflect on data submitted or to solve problems encountered by VHT users. Malaria Consortium, through our inSCALE project, has benefited from these findings to develop more sophisticated mobile phone-based systems for CHW reporting and supervision, which include feedback components. These models are currently being evaluated in both Mozambique and Uganda.

2.1.3. Participatory evaluation and documentation of ICCM experience

Little has been done prior to this project to systematically document the actual implementation methods that have been used across the ICCM implementation project sites. All key stakeholders involved in the CIDA ICCM programme over the past two years, including Ministry of Health personnel at all levels of the health system and implementing partners and beneficiaries, have generated experiences, lessons, and best practices. The participatory evaluation exercise provides a rare opportunity to document this wealth of experience in three countries – South Sudan, Uganda, and Zambia. It was decided not to include Mozambique as the duration of implementation was quite short.

The specific objectives of the evaluation were as follows:

- Gather experiences, lessons learnt, and best (fit) practices
- Effectively document our implementation models and processes in practice
- Promote participant learning and capacity building in evaluation methodologies

- Effectively disseminate these experiences for the purpose of wider learning on approaches for improving feasibility, acceptability and effectiveness in the delivery of services using an integrated community platform
- Develop case studies

The evaluation was mainly structured around interviews with key stakeholders at all levels from community through to national and international levels. Exact methodologies were developed by those involved in implementing the programme within a specific setting.

The scope of enquiry included the following aspects:

1. Central level preparation
2. Sub-national level introduction and start up
3. CHW recruitment and selection
4. Training and capacity building
5. Support supervision
6. Routine data collection
7. Commodities and supply chain
8. Community involvement and support
9. Behaviour change communication
10. E-health
11. Management and coordination
12. ICCM integration into the health system
13. Technical scope of ICCM
14. Evaluation

The data collection is completed in all countries – the analysis is currently being completed and country reports prepared. Once these reports are completed, an overall report of the evaluation will also be compiled. Dissemination of preliminary results has already started both in-country and at international events, and will continue once the final analysis is completed.

Preliminary results indicate that overall ICCM is well received and appreciated by communities and health workers. The findings shed valuable light on aspects of the project considered well implemented and provide the opportunity to understand which aspects are considered most critical and gather suggestions on how implementation can be improved.

- For example, the selection of community members to be trained as CHWs was highlighted as being very important and was required to be fair and transparent to instil a sense of trust and ownership in the community.
- Another important aspect highlighted was supportive supervision. Where done regularly and consistently, support supervision has a positive effect on CHW motivation and performance but where weak, CHWs can feel discouraged and alone in addressing challenges. Also home-visits by supervisors were highlighted as particularly beneficial.

The evaluation, documentation and dissemination of these lessons and experiences from multilevel stakeholders will inform ICCM implementers, including MoH, to use community platforms to deliver essential health care services even more effectively or at a larger scale.

2.1.4. Costing Data

Once the full cost data are available (analysis is currently ongoing in collaboration with Malaria Consortium's inSCALE project in Mozambique and Uganda, and we are collaborating with MSH's BMGF-supported project to analyse ICCM cost data in Zambia) the lives saved data and cost data will be used for a Value for Money assessment.

2.2. Other achievements of the programme

The achievements of this programme go beyond the activities and impact directly linked to the areas of ICCM implementation which are detailed above. It also proved to be a mechanism for strengthening the health system in the four countries, particularly in relation to delivery of health at community level. These broader achievements are presented within the framework for health system strengthening as defined by WHO. The six building blocks listed below are defined as being necessary to create a strong and well-functioning health service which delivers these four outcomes.

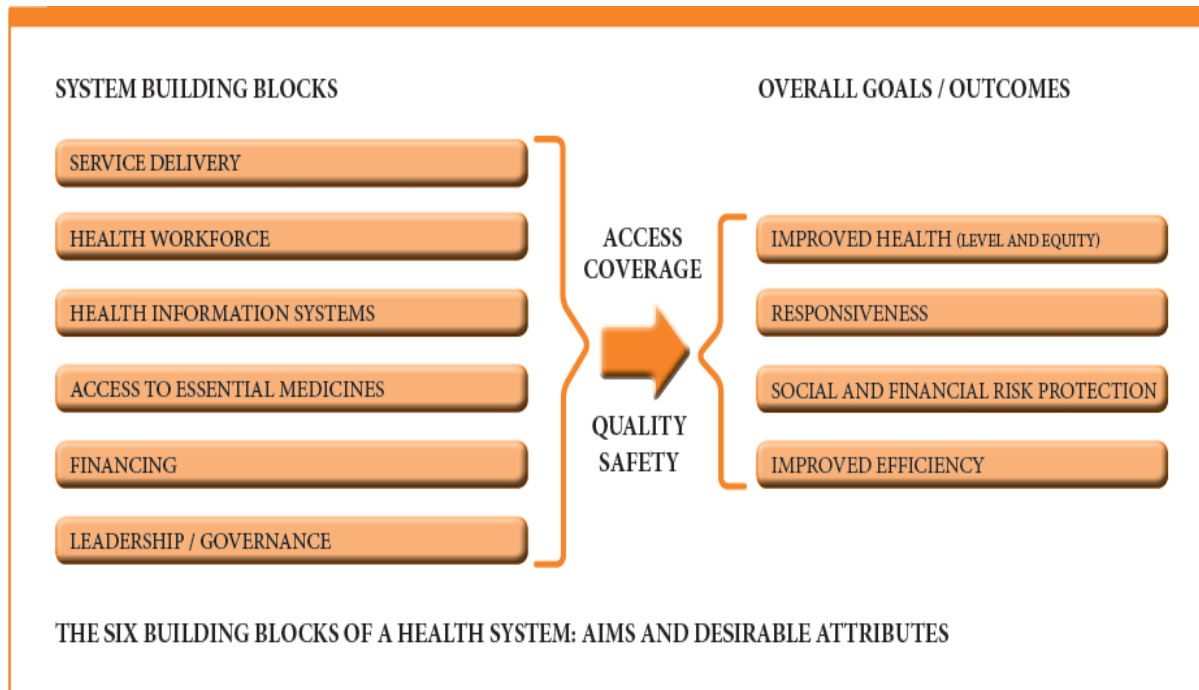


Figure 17: The WHO Health Systems Framework

Service Delivery: Working with MoH to translate the national ICCM policy and guidelines into practice at community level. This was done primarily through the development of tools for implementation of different aspects of the policy – e.g. training materials and curriculum; support supervision forms; registers and data collection forms; and stock management forms. These tools in many instances were approved and adopted by MoH for use within the national programme beyond this project. Effective delivery is dependent on demand and one of the cornerstones of this programme has been the engagement of communities in ICCM including the instilling of a strong sense of community ownership. This has been a strong feature of the participatory evaluation exercise where the feedback from communities has been overwhelmingly positive.

Health Workforce: One of the main achievements of this programme was the ICCM training conducted in all countries to create a large network of skilled community members enabled to provide an essential service. As a key element of this, the programme increased the capacity of MoH staff by training them as ICCM trainers and supervisors. These skills and understanding of the ICCM model will continue beyond the period and scope of this project. In Uganda alone, in excess of 7,000 VHTs were trained in ICCM and 1,336 MoH health staff. Furthermore, this programme has generated a knowledge base and significant amount of learning in each country. Through the Malaria Consortium project teams, a pool of skilled local people has been created who are highly experienced in all aspects of implementation and management of a well-functioning ICCM programme.

Health Information Systems: One of the common areas of weakness in most health services is data management including the transfer of data and information and feedback on data that has been submitted. Malaria Consortium has worked closely with MoH at all levels to develop and implement data collection systems for ICCM. It is recognised that indicators from ICCM should be included in national HMIS systems to ensure this service is included in national health data. To facilitate this inclusion, Malaria Consortium has developed databases for the ICCM project data in each country and this has been shared with MoH and other partners. In Mozambique, a computer with the database already loaded was given to each district health office and the data focal point person received trained in its use.

Access to Essential Medicines: Malaria Consortium advocated successfully for the inclusion of commodities and medicines specifically suited for treatment of young children by CHWs. This included unit dose packaged dispersible tablets with packaging which was colour-coded for different strengths and included pictorial table for administration of the medicine. MoH approval was granted for the use of mRDTs at community level in Uganda and a waiver was granted by the PRA in Zambia to use amoxicillin tablets as part of ICCM.

Financing: One of the aspects of this programme has been to provide financial information on the costs of implementing of an ICCM programme. These have included the start-up costs which are considerable and the ongoing costs of sustaining the service. Through the inSCALE project this costing exercise in Mozambique and Uganda goes beyond the direct project costs to include opportunity costs and costs for MoH. These costs are very important to assist the MoH in its fiscal planning and decision-making.



ICCM training for CDDs in Unity state, South Sudan

Leadership/Governance: The programme worked very closely with MoH in the development of policy frameworks – especially in Uganda and Mozambique where Malaria Consortium has been an active partner in the community health working groups created and led by MoH. Through these groups implementation guidelines were developed which defined the structure for a functioning ICCM programme including definition of roles and responsibilities at different levels of the health service. In addition, Malaria Consortium invested in the creation of coordination frameworks which were led by MoH and allowed for effective sharing of knowledge and information with all stakeholders as well as better harmonisation of activities.

Case Study: Solomon Spayer, Village Health Team volunteer

Solomon is 37 years old and lives in Kinogozi West Village, western Uganda, with his wife Joanna and their two children, Apollo nine and Jovan who is five. Malaria Consortium trained Solomon in Integrated Community Care Management (ICCM) of childhood diarrhoea, pneumonia and malaria, using guidelines and job aids developed in cooperation with the Ministry of Health. Solomon is now providing diagnosis, drugs and referral for the sick children in his village.

“The number of deaths in children under five has gone down a lot. I know this, because as a Parish Coordinator I always hear what is going on in the community. I would hear that such and such child had died, or listen to the radio announcements and find out that this woman’s baby had died,” says Solomon. “At least one child would die from malaria every month. These days, we bury our old men, not our children.”



6 KEY FACTORS AFFECTING PROGRESS

2.1. Factors supporting project achievement

Project activities were embedded within MoH structures at all levels especially sub-national levels to promote sustainability thereby increasing the leverage of resources, better alignment with other projects and initiatives, and better use of limited human resources.

- All countries were in a state of readiness for implementation of ICCM at sub-national level; Zambia and South Sudan were very receptive, Mozambique less so, because of ongoing policy dialogue on community health services
- Facilitating the participation of South Sudan MoH in a regional ICCM policy review meeting in 2012 resulted in a change of attitude regarding ICCM within MoH
- Provision of commodities including drugs enhanced acceptability at sub-national and community levels
- Initial sensitisation activities accelerated acceptance by target communities
- Low staff turnover in country teams ensured continuity in operations, a high level of understanding of the project, and implementation of lessons learnt
- Synergy with other Malaria Consortium projects enhanced complementarity and harmonisation of approaches – Pioneer, inSCALE, ICCM Central, Planet Wheeler, DFID PPA, Global Fund, other South Sudan projects.
- Investment in selection of drugs to ensure safe formulations and dosages. Used manufacturers who had Good Manufacturing Practice (GMP) certification and were nationally registered (or could demonstrate sufficient certification to gain exemption). Adherence to national procedures to ensure high drug quality and, where possible, contributed to pharmacovigilance systems (e.g. Malaria Consortium pharmacist specialist participating in national pharmacovigilance meetings in Uganda).

2.2. Factors adversely affecting project achievement and organisational responses

Adverse Factor	Organisational Response
<p>Embedding country activities into complex national institutional arrangements with competing priorities: In all countries, the projects were embedded as much as possible within the MoH structures at all levels, especially sub-national. While this was a strength in terms of sustainability, it led to implementation challenges as the MoH can have many different priorities and very different timelines</p>	<p>Engage in advocacy with senior MoH personnel Use champions within system (e.g. the Assistant Commissioner in MoH Uganda and the Director of Public Health in MoH Mozambique) Actively participate in technical working groups and coordination meetings to maintain momentum for development, review and adoption of the policies Support resource mobilisation to address gaps that were hindering implementation of national policies (e.g. Planet Wheeler in Mozambique, cost-sharing with Pioneer in Uganda) Focus on sub-national level to involve the MoH in decision-making and instilling a sense of ownership can be effective strategy if sufficiently autonomous</p>
<p>Varied political commitment throughout course of programme: At certain times there was a lack of political will for ICCM in MoH which caused blockages in terms of gaining approval to proceed with implementation</p>	<p>Collaborate with other implementing organisations (e.g. with Save the Children Mozambique) to present common voice in national fora Collaborate with other MoH departments also involved in community-level health delivery (e.g. in Uganda with NMCP in the CIDA-ICCM districts to extend their Home-Based Management of Fever training under Global Fund to include the full ICCM training package)</p>
<p>Poor security limiting ICCM activities: In South Sudan, the programme selected an area with great need which was a medium risk border state. At the beginning of project implementation the assessment was that the security situation could go either way – become more stable or deteriorate over the coming years.</p>	<p>Be responsive to security evaluations through UN situation reports and adhere to their recommendations. Close field office during potentially unstable times – (e.g. Malaria Consortium pre-emptively closed the office during the referendum and declaration of independence). When threat levels escalated and showed no indication of lessening (including fresh mining of roads out of Bentiu) the decision was made to close the office completely. Before this, Malaria Consortium hired a security consultant to ensure implementation of endline survey. Donate commodities to State MoH where appropriate and reallocate commodities to other Malaria Consortium projects in different states.</p>

Adverse Factor	Organisational Response
<p>Implementation of innovative model within a resource-constrained health system: Best judgement of effort required to gain national approval for new strategies at community level was an underestimation, especially of drugs for use at community level such as antibiotics and paracetamol. Also, the approval for use of mRDTs at this level was often not straightforward to obtain. Development of new tools to support this model was complex.</p>	<p>Conduct advocacy and engage global reputable agencies: one example concerned the necessary dosages of amoxicillin in Uganda. To gain evidence of need for higher dosages, we contacted the Department of Maternal, Newborn, Child and Adolescent Health in WHO Geneva. Their response was shared with Uganda MoH. Provide and share evidence supporting innovative approach – (e.g. showing that unit-dose pre-packaging improved adherence to treatment)</p>
<p>Absence of routine data systems for community-based delivery: Within the national routine data reporting system in most countries, the HMIS has either very little or no requirement for collection and inclusion of data from community-based health delivery services, such as ICCM. As a result, it required considerable additional effort to collect this data outside of the existing data collection systems. In addition, feedback systems on data reported were absent.</p>	<p>Advocate for inclusion of community data within HMIS, actively participate in MoH working groups to help define indicators for community-based service delivery reporting. In Uganda, Malaria Consortium piloted a phone-based system of data reporting Source additional funding to support data reporting systems (e.g. in Mozambique the procurement of computers with a database for APE data already installed for the district health offices and training given to the M&E focal point).</p>
<p>Lack of systems for procurement and management of commodities: The international procurement of drugs and managing them in-country right down to the community level proved very complex as there were no developed logistics and distribution chains in place. Due to lack of sufficient information to guide decision-making, initial quantifications for medicines which were based on incidence of disease only were greatly underestimated and did not match demand. Creation and management of commodity supply chains was challenging.</p>	<p>Invest enough resources and expertise to manage large-scale procurement of commodities for ICCM, including drugs. Develop guidelines for procurement, stock management. Initiate phased deliveries that can be revised based on consumption. Put systems in place to improve record-keeping of consumption that enabled better quantification for procurement and distribution. Factor in both community level demand increase and prevalence in quantification calculations. Also include commodities used during the trainings, especially mRDTs.</p>
<p>Over-ambitious plans during the formative phase of programme: The decision to conduct primary research to create BCC strategies tailor-made for each country proved over-ambitious given the capacity of the project. The research was time-consuming and expensive. It was also inadequately supervised, leading to poor quality research</p>	<p>Develop a prototype communication strategy from one country and then refine based on evaluation of implementation in other countries.</p>

CIDA ICCM programme sustainability capacity

Reduction in under five child mortality in order to achieve MDG4 requires substantial efforts using proven interventions that are cost-effective. There are several channels through which services are deployed, which include public sector and private sector health facilities, health commodities retailers such as pharmacies and drug shops, and public sector community-based agents. All these access channels contribute towards coverage with diagnosis and treatment, although their cost effectiveness will differ. Achieving and maintaining high coverage for both requires interventions that address existing access gaps and constraints to quality. Based on the evidence provided through this programme, ICCM is one approach that can be used to increase the access frontier and improve quality of services. This approach combines interventions for health education, diagnosis and treatment for the three most common diseases amongst children aged under five. This programme contributes critical information to a growing knowledge bank on the effective and sustainable implementation of ICCM and the associated cost benefit. .

In a broader context, national level efforts to increase access and improve quality have to be undertaken in a sustainable manner. Each approach to delivery of services should complement each other to create resilience and overall sustainability. It is still to be defined what are cost-effective combinations of approaches that countries should use for high and sustained coverage and how their implementation should adapt and improve over time. However, any model of ICCM implementation needs to develop capacity for sustainability if the beneficial outcomes of high coverage are to be preserved. Developing sustainability capacity is a process and not a one-off for such a complex approach.

The key aspects of ICCM that are essential for effectiveness and sustainability include the following:

- i) Desirable health behaviours amongst communities, such as early health seeking, immunisation, sanitation (irrespective of provider of health care), which would contribute to creation of demand for prevention and curative services.
- ii) Human resource capacity that supports high coverage, such as CHW competency to diagnose and treat children with malaria, pneumonia and diarrhoea, and to refer those they cannot manage. It also includes the competencies of health facility-based workers to support and supervise CHWs and the organisational capacity of the Ministry of Health to maintain conducive policies and guidelines that promote high coverage.
- iii) Uninterruptible availability of the health commodities needed for implementation.
- iv) Recurrent implementation activities such as supply chain management, supervision, health information management and behaviour change communication.
- v) Adequate financing.
- vi) National ownership and institutionalisation of implementation.

The support from this programme has helped the four countries to develop models for ICCM implementation at scale. The evidence from the programme's monitoring and results measurement suggests that in the implementation sites, the desired treatment seeking behaviour amongst communities have been improved, the health worker capacities have been built and the recurrent implementation activities are taking place. It is not appropriate to attribute all these changes to this programme but it is plausible that some of these changes are due to ICCM since in most sites it was the only new and large scale programme addressing these access gaps.

In all countries, where possible, the programme activities were embedded into national or sub-national health systems' structures and processes to promote national ownership and facilitate the

process of institutionalisation of implementation activities. This contributed to delays in implementation, especially in Mozambique, but was a necessary requirement for sustainability and could not, nor should be by-passed. There has been less success with sustained financing for this programme. It is an expensive programme to implement but the absence of cost-benefit information has made it more difficult to make the case for national investment in ICCM. This programme will provide some of this critical information and the lessons learned, will contribute to improvements in its cost-benefit. This is further work that should be carried on beyond this programme and Malaria Consortium is engaged in this process.

The literature on sustainability highlights some of the determinants of sustainability capacity of programmes^{3,4}. Through this CIDA funded programme, a number of these determinants were factored into implementation. Table 24 gives a summary of these determinants and some experiences from this programme.

Table 24: Experiences with programme sustainability capacity in the implementation of the CIDA-funded ICCM multi-country programme, highlighting factors in the programme that promoted its sustainability capacity.

Domain	Factors in programme design and implementation	Factors in the organisational setting of the Ministry of Health	Factors in broader community environment
Funding stability	Additionality to create better design with potential for success and greater benefits which increases the chances of institutionalisation Costing of implementation which will be needed for institutionalisation	Integrating the programme into the planning and budgeting processes which involve different departments and institutions e.g. Uganda National Medical Stores Costing	
Political support	Advocacy and increasing the visibility of the ICCM strategy, sometimes in collaboration with other projects such as inSCALE - Engagement process which was quite lengthy and opting to remain within the health system rather than creating a vertical programme Programme ownership by MoH	Advocacy Commitment to child health Champions of ICCM eg the Commissioner for Health Promotion and Education in Uganda and MoH officials and community leaders at provincial/district levels in Zambia Favourable political environment	Support from district health management teams in Zambia enabled the re-direction of excess medicines from health facilities to ICCM programme
Partnerships	UNICEF in Uganda and Mozambique Save the Children in Mozambique and South	Planning Harmonisation Coordination Additionality	Engagement of neighbourhood health committees in Zambia and

³ Schell SF, Luke DA, Schooley MW, Elliott MB, Herbers SH, Mueller NB, et al. Public health program capacity for sustainability: a new framework. *Implement Sci.* 2013;8:15

⁴ Shediach-Rizkallah MC, Bone LR. Planning for the sustainability of community-based health programs: conceptual frameworks and future directions for research, practice and policy. *Health Educ Res.* 1998 Mar;13(1):87-108.

Domain	Factors in programme design and implementation	Factors in the organisational setting of the Ministry of Health	Factors in broader community environment
	Sudan IRC also in South Sudan	Cross department collaboration	community health committees in Mozambique to strengthen acceptance and use of ICCM
Organisational or Community Capacity	Capacity building of VHT and of health officials	Skills enhancement through working together Learning by doing Policy formulation Guidelines development Implementation tools development Integration with other programmes	Community participation Community ownership Informed community demand for appropriate treatment Selection and training of VHTs
Programme Adaptation	Innovations Provision of drugs specifically for use at community level – packaging with visual instructions, unit-dose, colour-coded, paediatric strength dispersible tablets Adult-focused, participatory training methodology for ICCM	Learning by doing and incorporation of technical expertise in development of training materials and other ICCM tools (Mozambique, Uganda and Zambia).	
Programme Evaluation	HMIS Baseline and endline surveys	Strengthening of routine data monitoring systems Evaluation surveys	
Communications	Collection of data within MoH system Although not included in HMIS with exception of Mozambique (to a limited level)	Advocacy with strategic stakeholders on programme results Knowledge management approach	Presence of community structures such as Neighbourhood Health Committees (Zambia) and Community Health Committees (Mozambique)
Strategic planning	Linking into planning and budgeting cycles at national and subnational level	Planning and inclusion of Ministry of Finance	
Public Health Impacts	Selection of sites with greater public health need Selection of effective	Generation of evidence on impacts Research on strengths and weaknesses and	Previous experience and acceptance of community-based health interventions

Domain	Factors in programme design and implementation	Factors in the organisational setting of the Ministry of Health	Factors in broader community environment
	interventions Programme grant period to achieve impact (which we did not have); explain in narrative. Innovations Preventive and curative	improvements Use of a learning cycle	in all countries

8 LESSONS

In the course of this multi-country ICCM programme we have gathered valuable experiences which would be useful consideration for others embarking on a similar piece of work. Listed in the table below is some of the knowledge which *ab initio* was not anticipated, but was identified and fed into the programme learning cycle to improve ICCM implementation in at least one of the four country sites.

Table 25: List of lessons during implementation of this multi-country programme which contributed improvements to ICCM programme implementation in at least one of the four country sites

Key consideration	Lesson	Actions
<p>Policy framework</p>	<p>The policy landscape for ICCM is complex and requires involvement of various key stakeholders right from the outset of implementation. It is essential to identify key stakeholders through a stakeholder analysis prior to implementation and ensure this is regularly updated during programme implementation. Creating an enabling policy environment requires sufficient time because it cannot be rushed and yet has a critical influence on the pace of implementation. In addition, it requires sufficient resources in terms of funding and technical expertise.</p>	<p>Malaria Consortium engaged in advocacy and participated in MoH technical working groups with external partners. Where these groups did not exist, Malaria Consortium advocated and supported their creation.</p> <p>In the various countries of implementation there were differing levels of development of national policies for ICCM. In Uganda and Mozambique, the process of defining the new policy was already underway. Zambia had an enabling environment for ICCM but no national policy and in South Sudan there were many implementers of ICCM but no national policy.</p> <p>In South Sudan, ICCM implementation started in 2005, and although there was a MoH Child Survival Guideline which was developed in 2009 there was no overarching ICCM national policy. As a result there was no harmonisation of the various implementing partners and the implementation tools they were using. Malaria Consortium worked with MoH and partners to establish an ICCM taskforce to oversee a more harmonised approach and better coordination.</p>

Key consideration	Lesson	Actions
	<p>Flexibility should be accommodated in national policies on ICCM because there are contextual issues at sub-national level which can affect implementation effectiveness.</p> <p>It is important to discuss variations from the national model with MoH at all levels to ensure agreement and support. The community and implementers will sometimes make their own adaptations (e.g. in northern Uganda, on their own initiative the VHTs created the equivalent of parish coordinators).</p>	<p>In Uganda, to improve submission of community health information from VHTs to health facilities, Malaria Consortium introduced parish VHT coordinators whose role was to facilitate collection of registers from their catchment group of VHTs and also to collect the commodities from the health facility to distribute to their group of VHTs.</p>
Communications	<p>Sharing of information amongst key stakeholders should be proactively managed if it is to achieve its intended objectives.</p>	<p>At times information from the project was not flowing to all the relevant government levels. In Zambia the project was presented at national level and at provincial level during roll out. It was assumed the information would flow down the government hierarchy to the districts but this did not happen. To address this and to increase acceptance of the project, champions of ICCM were identified at different levels – provincial and district – and provided with more information on the project. They served as project focal points and used their influence at meetings with MoH at provincial and district levels.</p>
Capacity building	<p>When using a large-scale cascade training approach, the quality of training should be assured at all levels to prevent compromises at the end point (i.e. community level). Quality can be adversely affected by issues such as diluted or distorted messages being transmitted, low motivation of trainers resulting in incomplete training given, or using health workers as trainers even when they do not have the necessary training skills.</p>	<p>Malaria Consortium recruited a pool of core trainers who received ToT directly from our training consultant. At every training session of CHWs/VHTs one of these core trainers was present to work with the district MoH trainers.</p>

Key consideration	Lesson	Actions
	In the design of training tools, consideration should be made on best to deliver the technical content to trainees.	Realised the importance of adapting technical manuals to become training tools by following adult-focused, participatory training methodologies and training the trainers in this method.
	Supervision should be more intense in first few months of the programme to enable CHWs to develop their skills and confidence and to assure the quality of services. It is critical that errors be corrected early before they become habits.	
	Supervision is a motivation to the CHWs and an assurance to the communities that their CHWs have someone monitoring their work.	
Human resources	Selection of CHWs has an influence on their attrition rate and measures should be put in place to replace CHWs who drop out.	In areas where local leaders handpicked the CHWs, or appointed their relatives, most of these CHWs have since dropped out. Usually they dropped out during the training and it was possible to identify a replacement – community leaders were alerted to the consequences of this approach. Resources were included within the project to support training of new CHWs to fill the gaps caused by attrition.
Cross country sharing and learning	The learning process can be expedited and its quality improved by creating opportunities for programme implementers to share and learn from each other within and across countries.	Organised annual meetings for ICCM country project teams to share experiences, plan together, and problem solve.
Monitoring and Evaluation	Selection of comparator sites needs to include criteria beyond those relating to disease prevalence. These should include economic development, immunisation coverage, maternal education and nutrition levels. All of these influence child health, either directly or indirectly.	Collected this information retrospectively to inform interpretation of results from endline surveys

9 INFORMATION AND DISSEMINATION

Throughout the course of the CIDA ICCM programme, there have been a number of activities – both internally and externally to Malaria Consortium – to ensure dissemination of key information and learning from the implementation experience. As the programme was being implemented in four countries, a total of six project regional meetings were conducted to bring together the project managers from each country and the regional support team. This enabled country-to-country learning and the opportunity to hold “marketplaces”, where each country project could demonstrate the tools and strategies it had developed. These meetings were held mainly in Uganda. At one held in Inhambane province, Mozambique, the Head of the Provincial Health Team participated in part of the meeting. In addition, a regional meeting was held in 2011 to bring together the M&E officers from the four country teams and the regional M&E specialist to discuss the data that needed to be delivered by the end of the project.

Sharing of experiences and learning was enabled in a number of other ways. There were cross-country visits (e.g. the Zambia project manager visited the Uganda implementation area to understand how the training roll-out had been conducted and the Uganda project manager visited another ICCM project in South Sudan to do an evaluation of their training). There were also very frequent one-to-one meetings between the project team and health officials and project teams shared results with health officials for comment before finalisation. ICCM-CIDA shared information with other projects such as inSCALE through monthly phone calls and provided updates to CIDA on a semi-regular basis.

Written materials were also produced and disseminated. A series of project briefs was developed and uploaded on Malaria Consortium’s website and broadly distributed as hard copies. With DFID PPA funding two learning papers were produced – one on the training approach used in South Sudan for people with very low literacy⁵ and another on the Community Dialogue approach in Zambia. These documents were the focus of a roundtable event held in London in October 2012.

Collaborations with other grantees of CIDA ICCM funding also provided mechanisms for sharing materials and strengthening implementation. As an example, in Mozambique Malaria Consortium collaborated with UNICEF to complete the four-month training of APEs across Inhambane province and with Save the Children to revise the APEs training manuals. In South Sudan a collaboration with Save the Children and IRC enabled the completion of a joint endline survey to obtain information important to all collaborating partners. With MoH and other implementers Malaria Consortium normally holds face-to-face meetings to share information and planning.

Malaria Consortium has secured other funding to conduct events at country and global levels to disseminate the main findings from the four countries. And work has begun on the writing a number of end-of-project publications using programme evidence. These papers will focus on: i) the impact results from the programme; ii) routine data collection systems for ICCM; and iii) interpersonal communication skills and quality of care within the ICCM programme in Uganda. The dissemination plan also includes participation in global fora to present programme findings and the development of more learning papers based on implementation experience.

A key value of these dissemination activities is the sharing of important issues/challenges that other implementers/organisations such as MoHs are likely to face when starting or scaling up an ICCM programme, as well as means of addressing them. The aim is to increase their understanding of the

⁵ <http://www.malariaconsortium.org/resources/publications/182/developing-and-implementing-training-materials-for-integrated-community-case-management-in-south-sudan>

complexities of ICCM implementation as well as potential solutions to problems, in order to maximise the benefits they will gain from implementing ICCM.

10 CONCLUSIONS

Some of the main conclusions reached, as this programme comes to an end, are as follows:

13. Once the trained and equipped community health workers were deployed, **uptake of their services was rapid and extensive** in all countries demonstrating the appropriateness of providing health services in this way. **Demand was readily created.**
14. ICCM does **contribute to increased coverage with diagnosis and treatment** for the three main childhood diseases, malaria, pneumonia and diarrhoea, as shown by the survey results. A **significant increase in timely treatment (within 24 hours)** was also recorded for fever and for cough and fast breathing in Uganda and Zambia, whilst in Mozambique and South Sudan there were increases, but endline levels were still low.
15. Initial assessment of the impact of ICCM on mortality using birth history data showed a **reduction in U5MR in Zambia from 127 to 100/1,000 live births and a reduction in IMR from 67 to 60. Uganda showed reductions but smaller**, and there were actually greater reductions in the comparator areas, whereas IMR in the Zambia comparator area increased. In South Sudan there was a reduction in U5MR from 55 to 40 post-intervention and 33 to 38 in the comparator area. We have looked closely at South Sudan data, as there were severe disruptions during the endline survey due to security, which may have affected quality. Further review of the mortality data is planned before conclusions are made on its interpretation. Our application of the **Lives Saved Tool (LiST) to model potential impact on U5MR showed some deaths averted** in all countries.
16. It would be useful to undertake **further analysis** of the routine monitoring data and the survey data, as well as looking at other data sources from the national health management information systems in order **to deepen our understanding about who is reached by ICCM. Improvements in access** to high quality diagnosis and treatment can be measured by **not only the numbers of people using the service and the quality of that service, but also by the overall numbers of people reaching appropriate care from any source.** This can be shown from the numbers seeking treatment from each source in surveys as well as reviewing patient load over all treatment sources – community, public facilities and private sector.
17. Whilst the **programme was overall highly successful and more than 2 million treatments were provided by more than nine thousand trained community health workers (CHWs)**, much of the programme's real achievements occurred before diagnosis and treatment could begin. The **process of establishing the programme** and going through the steps of initial advocacy, supporting Ministries on policy development, production of appropriate training and behaviour change materials, ordering and distributing drugs and commodities **cannot be underestimated**, and must be done thoroughly but efficiently.
18. As a result of point 5, it is important to **be realistic about the time needed for such a community approach to become bedded in and ready for evaluation.** The programme has worked to measure impact at this stage, however a more robust measure would need to be made once the programme was fully up and running for a minimum of 12 months.
19. **Evaluation of probability of impact attributable to the programme** is not straightforward when implementing a large-scale intervention within a national health service as opposed to a controlled research study. While every effort was made to select comparator areas which were comparable at baseline to the intervention areas, it is not possible to control for all possible confounders. For this reason, reasons for some significant changes observed in the comparator

areas have not always been well understood and this limits the ability to attribute impact to the ICCM programme.

20. The **training model** applied in the programme, in which we followed MOH guidelines and gave substantial technical inputs into curricula and tools including job aids, then used an adult, **participatory learning methodology worked well, but with further resources we would have wanted to undertake a more in-depth evaluation of the quality and outcome** of the training approach. Support supervision after training was highly appreciated, and was an opportunity for post training follow-up, although there were challenges in assuring individual supervision at the CHWs' homes.
21. The **behaviour change communication approach was seen as a real strength** of the programme. It involved formative research in each country followed by strategy development and community dialogues led by community leaders and CHWs. Lessons from this approach have been widely shared with in the international ICCM community.
22. A key element which was built into the approach was to ensure where possible that the **facilities responsible for supervising, supplying and receiving referrals from the CHWs also had necessary capacity building** and were included in communications. This led to a strong health system, that could support ICCM
23. **Sustainability** is critical to ensure the investments to date have useful returns. Our approach of **embedding most programme components within MOH processes and structures** has been an essential element of promoting sustainability. In addition, using other sources of funds, we have undertaken **substantial advocacy** to support resource mobilisation for continuity. This has been successful in Mozambique and South Sudan, but there are still major gaps in Uganda and Zambia. Work on **costing the intervention** is ongoing and will be an important contribution to plans for sustainability.
24. Finally, while there are key core elements of ICCM which are the same in every country, it is important that local **variations between and even within countries feed into a tailor-made approach that is adapted to local circumstances and needs**. An example is our addition of screening for severe and acute malnutrition in South Sudan to meet a need most appropriately met through the same mechanisms as ICCM. From this programme, we have many lessons from four very different contexts, which will continue to be shared through post-programme dissemination.

Annexes

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| Annex 1 | Stock Audit Report |
| Annex 2 | Country reports – last reporting period |
| <i>Annex 2.1</i> | <i>Mozambique</i> |
| <i>Annex 2.2</i> | <i>South Sudan</i> |
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IMPROVING ACCESS FOR UNDER FIVES TO LIFE-SAVING TREATMENT THROUGH INTEGRATED COMMUNITY CASE MANAGEMENT FOR MALARIA, PNEUMONIA AND DIARRHOEA

ANNEX 1 - STOCK REPORT

Background:

35% of the project budget relates to procurement and distribution of drug to support the Community Health Workers (CHWs) in the four countries. All procurements were carried out using a procurement agent, the International Procurement Agency. The delivery and distribution chain differed per country but the majority of the stock passed through Malaria Consortium's warehouses before being delivered to the Health Authorities or directly to the CHWs.

Malaria Consortium's Procurement Manual was followed in each country to safeguard the stock and ensure each stage of the procurement, storage and distribution chain was fully documented.

As part of the normal grant closure procedures, a full stock count was conducted of the relevant Malaria Consortium warehouses to reconcile the stock and ensure all CIDA funded stock was correctly accounted for.

Grant closure stock reconciliations:

Uganda and Mozambique: Stock counts were held at all relevant warehouses and all paperwork was reviewed to support procurements, deliveries into warehouses, distributions from warehouses and confirmed deliveries to health centers or beneficiaries. Based on the counts and records held, only very minor differences were found. These minor differences were deemed well within the tolerance level of such an exercise hence no further work was deemed necessary. All supporting documentation is with Malaria Consortium country offices and is available on request.

South Sudan: As detailed in the main report, the project in South Sudan had to be closed due to insecurity in the area. During the closure of the Unity office and withdrawal from Unity State the stock records were collected. However, during the withdrawal, the records were misplaced. Due to the insecurity it was deemed unsafe to perform further investigations in the state to recover the documents. Malaria Consortium therefore informed CIDA, in writing, on 21 February 2013.

It should be noted that due to the loss, Malaria Consortium holds no supporting documents to demonstrate the receipt of the commodities into Malaria Consortium's warehouse or to demonstrate delivery to drug to the beneficiaries in Unity State.

Zambia: A stock count was conducted of the Malaria Consortium stores and internal paperwork collected. Due to staff turnover the paperwork to support distributions was found to be partly incomplete. Based on this, Malaria Consortium, at its own expense, commissioned external facilitators to re-collect the good received notes from the District Health Authorities to confirm deliveries. This information was received and the reconciliation process part completed on site. The records were then transferred by hand to Kampala by the Regional ICCM M&E Officer. The records were transferred as hand luggage to mitigate the risk of the airline accidentally losing the records. Unfortunately, somewhere between leaving the airport in Entebbe and reaching the Africa Regional Office in Kampala, the records were lost.

The loss of these records was immediately reported to Malaria Consortium senior management and a detailed investigation was carried out in collaboration with the company that provided the airport transfer. This investigation involved the airport's Aviation Security and the Aviation Police, including sourcing closed circuit TV footage to trace the records' movements through the airport.

Unfortunately, the records were not found and despite there being an open case with the Police, Malaria Consortium does not expect to recover these records. This was communicated to CIDA, in writing on 28 January 2013.

Based on the work completed and the initial informal analysis conducted before the loss of the records, Malaria Consortium is reasonably confident that the records for Zambia were complete. However, it should be noted that due to the loss, Malaria Consortium holds no supporting documents to demonstrate the receipt of the commodities into the Malaria Consortium's Zambia warehouse or to demonstrate delivery to the health authorities across Luapula District.

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