

HEALTH SYSTEMS STRENGTHENING ROUNDTABLE  
*CLOVER COUNTRY REPORT: ZAMBIA*



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Malaria Consortium Zambia began its work on health systems strengthening in 2005, under the second phase, Irish Aid-funded Clover II project. At that time, Clover was implemented only in Southern Province. Clover II's most important achievements were 1) the establishment and support for district-level Malaria Task Forces, the first sub-national, public-private partnerships for malaria prevention and control in Southern Africa and b) the creation of innovative rapid diagnostic test (RDT) training modules targeted to both rural health facility workers (HFWs) and community health workers (CHWs), the IEC/BCC materials for which were adopted and scaled up by the World Health Organization (WHO).



Following the extension of funding via the third phase Clover III project in 2008, Malaria Consortium expanded its activities into Eastern Province. Presently, Malaria Consortium Zambia works in all 19 districts across Southern and Eastern Province, reaching a population of approximately 3.2 million people [Figure 1]. Its relationship with sub-national stakeholders is its greatest strength and Malaria Consortium Zambia is continually cited by provincial and district administrators as one of their most important partners.

Presently, there is no national framework for HSS in Zambia; however, there has been a consecutive, 5-year, USAID-funded HSS programs since the mid-1990s. The most recent, HSSP (Health Systems Strengthening Program), ended in mid-2010. The newest incarnation – the Zambia Integrated Systems Strengthening Program (ZISSP) – is overseen by Abt Associates. HSSP had malaria components built into it (such as bed net purchase and distribution). ZISSP's

malaria will focus primarily on IEC/BCC and research. Clover III, however, is the only programme in Zambia at present that uses malaria technical interventions as a means of building capacity across systems at the district-level.

### Background

Zambia is a land-locked, Central African country sharing borders with Democratic Republic of Congo, Tanzania, Malawi, Mozambique, Zimbabwe, Botswana, Namibia and Angola. Zambia is made up of nine Provinces and 72 Districts. The estimated current population is 12 million based on a population growth rate of 2.4 percent per annum.

Zambia has a high disease burden and faces a number of challenges common to developing countries [Table 1]. Immunization coverage rates, while high at the national level, vary considerably from province to province, with some regions falling significantly below the national average. Diarrhea and acute respiratory illness (ARI) still account for 35% of deaths among children <5 years of age. Neonatal factors account for another 20%, while malaria accounts for 17%. Under-5 mortality rate (170 per 1,000) and infant mortality rates (103 per 1,000) remain much higher than the regional averages (145 and 88 respectively). The HIV prevalence rate is estimated to be as high as 17% and, largely due to the ravages of the epidemic, the average Zambian has a life expectancy at birth of only 46 years.

The primary mission of the Zambian National Health Strategy is to provide “cost-effective, quality health services as close to the family as possible.” Public sector health services are structured as follows: [Figure 2] Under this structure, most Zambians receive their primary health care from both rural and urban health centres (HCs), and their secondary care from district hospitals. Health services have been free at rural health centres (RHCs) since 2006, but user fees are levied elsewhere. Health centers should serve a catchment population of 30,000 – 50,000 people, while district hospitals 80,000-200,000 people; nevertheless, 50% of the rural population lives more than

5km from the nearest health center. There is approximately one health center per 6,780 people. Only 43% of trained health workers in Zambia reach the WHO-recommended level of 2.4 workers per 1,000 population and less than 50% of frontline health workers are available relative to the need for primary health care services. Turnover of staff at all levels of the health system is high and the Ministry of Health (MoH) is restricted from hiring new staff due to highly indebted poor countries (HIPC) completion conditionality. The National Decentralization Policy, launched in 2003, has meant that districts have a degree of autonomy in planning and budgeting health activities at the sub-national level.

Zambia is making moderate progress meeting a number of its health-related MDGs and its progress is immediately noticeable in Zambia's malaria prevention and control efforts [Table 2]. Zambia is the sixth largest recipient of malaria funding in Africa, with most of its funding coming from Global Fund and USAID. Bed net coverage is much higher than many of its neighbors. 4.8 million LLINs were distributed between 2006 and 2008. 3.1 million courses of ACT were distributed in 2008, reaching close to 1/3 of patients diagnosed with malaria in public sector health facilities. It is one of only nine countries in Africa with evidence of a greater than 50% decrease in malaria incidence cases in between 2000 and 2008, along with a 35% decrease in under-5 all cause child mortality rates. Malaria prevention and control is coordinated centrally by the National Malaria Control Centre (NMCC), part of the MoH. At the provincial level, the Provincial Medical Officer oversees disease control efforts, while Malaria Focal Point People coordinate efforts among District Health Management Teams (DHMTs), which include District Environmental Health Technicians (DEHTs), District Health Information Officers (DHIOs) and other specialists. Besides Malaria Consortium, other partners provide financial, technical and logistical support for malaria including PATH's MACE-PA program, USAID's President's Malaria Initiative (PMI), Society for Family Health (SFH), UNICEF, WHO and Harvard University's Harvard Business Services (HBS).

World Health Organization. 2009. *World Health Statistics 2009*. Geneva: World Health Organization, p. 55.

World Health Organization. 2009. *World Health Statistics 2009*. Geneva: World Health Organization, p. 43.

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Government of Zambia. 2005. *National Health Strategic Plan 2006-2011*. Lusaka: Ministry of Health, p.1.

See Annex 1 for facility coverage statistics in Eastern and Southern Province.

World Bank. 2008. *The International Development Association Country Assistance Strategy for the Republic of Zambia*. March 28, 2008. Lusaka: World Bank.

Ministry of Health, 2009, *Draft concept note for the development of a community health worker national strategy*, May 28, 2009, MoH: Lusaka

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In Zambia, Clover is presently situated in Southern and Eastern Province. With regard to most activities, all 19 districts in these provinces have been reached, with the exception of Case Management trainings, which were implemented in five districts. Clover is managed from the county capital, Lusaka. A Technical Officer and two Projects Officers implement Clover activities in both Provinces. Partnerships with the public and private sectors, as well as the willingness of Projects Officers to continuously travel, have played a large role in the success of Malaria Consortium. Since 2008, there has been a number of mutually-reinforcing health systems strengthening projects carried out sub-nationally under Clover, targeting multiple components of the health system. Some of the most important include:

#### **Malaria Task Forces (MATF)**

Clover-Malaria Consortium sought to create district-level public-private synergies – modeled on the AIDS Task Force idea – for the purpose of malaria prevention and control. Between 2005-2008, they funded the organization and training of 19 MATFs across Clover project districts. Clover tapped not only public sector health officials, but also non-health line ministry government representatives, businesspeople, religious leaders, utility company executives, police, community-based organizations, NGOs and other relevant stakeholders. The primary objective of the MATF is the mobilization of resources in the following categories: financial support, material support, technical support and moral support. Resource mobilization should directly feed into better planning, implementation, coordination and dissemination of information. MATFs targeted the following components of the health system: health financing and health leadership and governance.

#### **Case Management (CM)**

Clover carried out trainings of all HF, Hospital and Health Post staff in five selected pilot districts (Chama, Gwembe, Itezhi Tezhi, Katete, and Siavonga) from 2009-2010. Recognizing that the human resources crisis in the health sector has left many RHCs staffed by nurses, medical assistants or even building caretakers, all workers at RHCs, regardless of

medical qualification, were trained in the accuracy and administration of RDTs and the appropriate diagnosis and treatment of uncomplicated malaria. They are also trained in record-keeping of ACT and RDT supplies. Case Management targeted the following components of the health system: health services delivery, health workforce, health information systems and medical product supply chain.

#### **HMIS Training (HMIS)**

Malaria Consortium sought to empower District Health Information Officers (DHIOs) and Data Associates (DAs) to not only better manage health systems data, but to identify gaps and outliers and interpret trends in information at the health facility and district level. HMIS Data Review Workshops were carried out, initially in partnership with the NMCC, Harvard University, MACEPA and WHO. Malaria Consortium then developed a series of follow up trainings. DHIOs and DAs in Eastern and Southern Province were trained to detect incomplete, incorrect and inconsistent records, prepare data sets, analyze and present information in graph and table form, and interpret evidence for use in District Health Action Plans. HMIS targeted the following components of the health system: health services delivery, health workforce, health information systems and medical product supply chain.

#### **Quality Assurance of Malaria Microscopy (QA)**

The Improving Malaria Diagnostics (IMaD) is a President's Malaria Initiative-funded project to strengthen malaria diagnostic capacity through interventions such as training of lab supervisors and developing monitoring and quality assurance mechanisms. IMaD in Zambia is a partnership between NMCC, PMI, Medical Care Development International, (MCDI), Malaria Consortium and other organizations. A quality assurance programme was developed for implementation across Zambia in the first quarter of 2010. Provincial supervisors were trained to carry out quarterly visits to district laboratory facilities. Clover-Malaria Consortium supported IMaD in Southern and Eastern Province by providing training, funding and technical oversight of provincial supervi-

sors as they can carry out these supervisory visits. They are also providing updated training for laboratory technicians in Southern and Eastern Province hospitals in malaria microscopy. QA targeted the following components of the health system: health workforce, health services delivery, health information systems and medical product supply chain.

#### **Zambulance**

In January 2010, Malaria Consortium placed 57 bike ambulances (Zambulances) at the community level in target districts in Southern and Eastern Province after a request for increased support for CHWs by the provincial and district health teams. Zambulances are manufactured locally by the NGO Zambikes and are delivered alongside basic bicycle maintenance instruction and standardized log books (Figure 3). Logbooks were altered by Clover-Malaria Consortium to reflect both the informational needs of the CHW, RHC and DHMT. Recipient CHWs have been identified by DHMTs according to "activity" level, distance to RHC, and ability to ride a Zambulance and transport patients. Recent assessments, July 2010 have indicated that over 100 emergency patient's lives have been saved over a four months period of intervention. The conditions have ranged from malaria to HIV/AIDS, dysentery to obstetric emergencies (). Severe malaria and pregnancy complications appear to make the bulk of the case transported. Zambulance distribution targeted the following components of the health system: health workforce, health services delivery and health information systems.

#### **Performance Assessments (PA)**

Malaria Consortium provided logistical and financial support for PA activities in Eastern and Southern Province in order to ensure that, as with diagnostics, quality assurance of health services regularly takes place. As with the IMaD project, supporting PAs helped to ensure provincial technical oversight of appropriate malaria case management, contributed to the generation of information on how RHC workers diagnose and treat malaria and supported decentralization by strengthening provincial oversight capacity. PA targeted the following

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Malaria Consortium Eastern and Southern Province Projects Officers have managed, in a very short period of time, to create robust working relationships with Provincial and District Health Managers, as well as carry out a critical mass of HSS activities across most Clover programme areas in all 19 target districts. The commitment Malaria Consortium demonstrated to the needs and interests of district managers, the willingness of Program Officers to continually visit and revisit stakeholders, and the range, relevancy and volume of activities that were carried out in an 18 month period of time were all duly noted by sub-national partners. As a consequence, Malaria Consortium is very highly regarded at the sub-national level.

The primary achievements and innovations that Clover brought to HSS in Eastern and Southern Province can be understood both programmatically – that is, in terms of the specific project areas of Clover – and, more generally, in the way that Clover activities as integrated and mutually-reinforcing to create value across multiple levels of the health system. The most important accomplishments of Clover Zambia are:

### **1. Sub-National Level Public-Private Partnership for Malaria Prevention and Control**

One strategy to mobilize financial and human resources at the district- and sub-district level has been the establishment of health problem-specific task forces. Starting in 2005, and scaling-up in 2008, Clover partnered with DHMTs and other stakeholders to establish district-level public-private synergies for the purpose of malaria prevention and control- the Malaria Task Force (MATF). The Secretariat for the MATF is located at the DHMT, while the Chair and Vice-Chair are representatives from line ministries or the private sector. The primary objective of the MATF is the mobilization of resources in the following categories: financial support, material support, technical support and moral support. Ideally, resource mobilization should directly feed into better planning, implementation and dissemination of information. Clover III supported the organization and training of all 19 district Malaria Task Forces (MATFs) across Southern Province and Eastern Province. In total, 456 stakeholders were trained and over 500 copies of the MATF training manual were produced and distributed (Figure 6).

“The need for concerted efforts and stakeholder involvement in the fight against

malaria cannot be over emphasized. We are confident that with strengthened partnerships at all levels, local, district, national and international, it is possible to attain our vision of a malaria-free Zambia.”

Dr. V.C. Mtonga - Acting Permanent Secretary, Ministry of Health

Outcomes: MATFs have had mixed, though generally positive, results. In Livingstone, Southern Province, the MATF is a key stakeholder in malaria prevention and control, has a strong mix of private sector, line ministry, utility and other partners, and is integrated fully into DHMT activities. It is a benchmark districts for the model and has received regional visitors seeking to emulate MATFs in other countries. Other MATFs have proven to be reasonably active, holding regular meetings, and being key partners in IRS mobilization, World Malaria Day organization, ITN distribution and other targeted activities (Figure 4). Still others – especially those lacking a wide array of reasonably prosperous partners -- have struggled to move forward. All have been hampered by problems with buy-in at central level by non-health line ministries or by the head offices of private business. Many too have had a difficult time prioritizing realistic or relevant activities. In most instances, however, these challenges are not insurmountable and there are clear, targeted interventions that could take place to strengthen those that are weak, and to boost the capacity of those which could do more. In short, the way forward for MATFs, perhaps more so than any other Clover intervention, is clear and very easily realized.

The Government and other organizations have embraced Malaria Task Forces. Clover is working closely with them for improved planning and coordination of malaria control interventions at district level. The USAID supported Health Communications Partnership (HCP) and Rapids have formed 16 and 3 District MATFs respectively in 7 Provinces in addition to 19 formed by Clover bringing the total to 36 District Malaria Task Forces in 36 out of 73 Districts. Currently, the government is developing the National Malaria Strategic Plan for 2011 – 2016. Formation and strengthening of District Malaria Task Forces is a priority under the communication strategy component of this plan.

### **2. Empowering Districts in Information Management**

The Health Management Information System (HMIS) is a critical component of evidence-based policy making in Zambia. For a number of years, data was collected at the local level, aggregated at the district and then sent on to central health authorities with limited checks on quality and consistency

and infrequent feedback to primary health care providers and district-level planning officers. Health facilities and districts lacked the capacity to generate high quality data and, most importantly, to understand and make use of it. This situation has been progressively changing since the MoH began up-grading its HMIS system.

Under Clover III, the MoH and Clover-Malaria Consortium sought to empower District Health Information Officers (DHIOs), Data Associates (DAs) and Malaria Focal Point Persons (MFPPs) to not only better manage health systems data, but to identify gaps and interpret trends in information at the health facility and district level. In February - June 2009, 6 HMIS Data Review Workshops were carried out, in partnership with the MoH, Harvard University, MACEPA and WHO. DHIOs, DAs and MFPPs in Eastern and Southern Province were trained to detect incomplete and inconsistent records, prepare data sets, analyze and present information in graph and table form, and interpret evidence for use in District Health Action Plans. Following a radical restructuring of the HMIS to increase its flexibility and its usefulness at provincial and district levels, reorientations were carried out in March 2010 to familiarize DHIOs/DAs/MFPPs in the new data management system. In total, 209 district health information managers trained, covering 481 health centres across 19 districts, and 209 HMIS manuals were printed and distributed. The updated version of the HMIS manual is scheduled for distribution at the end of 2010.

Outcomes: The original exercise in partnerships with MoH, Harvard and MACEPA resulted nationally in the retrieval of 1,901 missing quarterly reports and the addition of 28 facilities into the HMIS, thereby marking a major improvement in quality of malaria data in the national HMIS. At the same time, partners pulled out of the follow-up activities after the initial series of trainings in 2009. Shortly after, the HMIS was changed radically and the MoH underwent major restructuring. Malaria Consortium carried on with refresher courses tailored to the updated version and added components on evidence-based decision-making. These follow-up trainings in March 2010 demonstrated that 11 out of 19 DHIOs had arrived at their posts after the original trainings and, following adoption of the new HMIS. Among those attending the March 2010 refresher course, 29% of those trained did not know or were unsure of what an Excel Worksheet was, 22% did not know how to scroll on an Excel sheet, and 20% did not understand what a Menu or a Toolbar was.

Most of those who stated “don’t know” or “unsure”, moreover, were MFPPs who had received training in 2009 and, due to lack of practice and access to computer resources at the district level, had forgotten what they learned. Of those who did receive training, however, 84% felt that training was helpful to their work “all the time” and 63% felt that they used the information from past trainings in their work “all the time.” As a consequence, the refresher courses were immediately valuable to those taking part. In qualitative interviews, moreover, District Directors of Health, DHIOs and MFPPs continually emphasized the value of HMIS trainings and had a number of suggestions for future trainings with specific emphasis on improving data management at the health facility level.

### **3. The 100% Model for Case Management of Malaria Training**

Since 2005, Zambia’s national guidelines for the diagnosis and treatment of uncomplicated malaria have emphasized laboratory-based confirmation of malaria followed by treatment with first-line artemisinin-based combination therapy (ACT). In the Zambian public sector, ACT consists solely of Coartem®. Prior to the adoption of ACT in 2003, and the increased availability of Rapid Diagnostic Tests (RDTs), health workers in hospitals and rural health centers (RHCs) traditionally diagnosed malaria clinically – that is, through presentation of fever and other symptoms – due to a lack of supplies, electricity and laboratory technicians. RDTs have now allowed for laboratory-based confirmation to take place even in RHCs which lack these resources. Because RDTs and Coartem® are new technologies, many health workers still distrust their validity and reliability. Many health workers still fail to follow national guidelines and the Ministry of Health (MoH) has limited capacity to enforce proper adherence to the guidelines at RHCs. The human resources limitation has meant that many RHCs are dependent on a single technician or nurse and rely upon support from casual, untrained laborers, such as cleaners or guards.

In 2009, Malaria Consortium partnered with Provincial and District Health Management Teams to carry out trainings in appropriate case management of malaria in 5 districts – Gwembe, Itezhi Tezhi, Sivaonga, Katete and Chama – known to have high burden of malaria. Malaria Consortium trained 100% of HCWs, regardless of whether they had professional status, in 100% of facilities in these districts. In the past, case management trainings in Zambia – whether related to malaria or other programs, like IMCI –

have often relied upon cascade models of training to limited effect. The top tiers of the cascade rarely had the resources to train those lower down the cascade. Moreover, the negative impact that one-off, high level trainings have on sub-national stakeholders’ perceptions of partner commitment and seriousness – as well as the corrosive effect on morale and creates jealousy among colleagues who are left behind – is enormous. By targeting every HCW – 542 individuals – irrespective of whether they had received ‘professional’ training or not – in every facility (rural, urban, hospital and health post) in the five districts, Clover-Malaria Consortium sought to both challenge the cascade model and guarantee some degree of continuity even in the face of the human resources crisis.

In view of this, Clover conducted case management training on site, using hands on approach in 5 districts which have had a profound effect on rural health centre (RHC) workers’ understanding of and acceptability of RDTs and blood slides in confirming malaria diagnosis.

#### **Outcomes:**

The case management training resulted in improved case management of non-malaria fevers, reduced reported cases of malaria and lots of ACTs saved (Fig 5-6). In Zambia, RHC workers are now better equipped to both look for and treat alternative causes of fever.

The most significant barrier to the success of case management has been RDT shortages, but that immediately before and after trainings, in instances where both RDTs were stocked in and RDT registers exist, case management trainings have had significant impact on CHWs following the case appropriately (positive RDT followed with correct malaria medication; negative RDTs followed with no malaria drug). The main challenge is how to ensure sustainability of these trainings over time.

### **4. HSS through Integration of Implementation**

Clover-Malaria Consortium support for Case Management, HMIS, Performance Assessment, Malaria Task Forces and other activities in many instance, fed into and added value across multiple Clover programme areas and consciously built upon separate but inter-related ideas to strengthen the system as a whole. For example, the Malaria Consortium Case Management intervention which was targeted at the health facility level fed into and supported district-level Malaria Consortium HMIS trainings. The former ensured that Health Facility Workers had the capacity to more effective-

ly and accurately diagnose and keep record of malaria prevalence, RDT use and ACTs consumption and create a more accurate and consistent set of data feeding into District Health Information Systems. The latter helped District Health Information Officers to do data collection and management, and present it more effectively to district and provincial managers. Performance Assessments, in turn, drew up the data that was generated and, in turn, fed it back down to the facility level to help improve quality at the primary health level.

In this way, the Malaria Consortium Zambia team treated Clover as an interconnected, integrated set of activities, rather than a set of disconnected, malaria-specific technical interventions targeted to separate components of the health system. All the activities that were implemented all built capacity across DHMTs and were appreciated and deemed extremely relevant by Provincial Medical Officers, District Directors of Health and the beneficiaries of the trainings themselves.

### **5. Home Management of Malaria / Community Fever Case Management**

Zambia’s Health Strategy prioritizes delivery of health care as close to the family as possible. CHWs – undervalued and poorly supported in the past – are expected to play an increasingly important role in the primary health system. At the community-level, the only options available for suspected malaria presently involve either traveling – sometimes at great distance and expense – to the RHC, or self-treatment. This is why the NMCC is active in the process of rolling out Home Management of Malaria (HMM) which involves training public sector and CHWs to carry out tests and provide treatment.

Malaria Consortium-Clover trained CHWs in RDT administration, appropriate treatment, and fever management (Figure 7). This experience has fed into a new, non-Clover, CIDA-funded pilot in Luapula Province in which Malaria Consortium is training 100% of district-identified CHWs in community fever case management (CFCM), which adds diagnosis of pneumonia and treatment with amoxicillin to the model. By training at the community level, Malaria Consortium is supporting the MoH in its commitment to primary health care and decentralized service provision, enhancing the skill sets of volunteer CHWs, creating a mechanism by which data on malaria, fever and pneumonia can be recorded and collected at community level and, most importantly, integrating typically vertical malaria programming into management of childhood illness.

Like with Case Management Trainings, HMM and CFCM are only as effective as the supply chain allows them to be. There is currently no nationwide system in place to support the sort of supply chain logistics required to sustain an efficient and effective primary health system. The National Essential Drugs Pilot Logistics System is an important first step, but it is vital that CPs provide financial and technical support to the supply chain all the way down to the level of the user.

### 6. Drug Supply Management

The delivery of malaria drugs, supplies and commodities are carried out centrally in Zambia with the national drug store (Medical Stores Ltd) supplying drugs and commodities using the push system. A partnership was identified with JSI/USAID | DELIVER PROJECT. Malaria Consortium-Clover provided technical and financial support to the partnership. The partnership carried out the following activities to identify the most cost-effective way to improve the availability of drugs through piloting two models for delivering medicines and supplies to the health facilities.

A one year pilot called the Essential Drugs Pilot Logistics System (EDPLS), tested two different models (A&B) for getting drugs to health facilities in Zambia's remote districts. The availability of these drugs in the pilot districts were compared with availability in control districts.

The models - Model A -Health facilities placed orders with the district planner who sent an aggregated order to central medical Stores. The commodities were sent back to the districts that were responsible for assembling orders for the facilities and delivering them. Model B - Health facilities placed their orders directly with central medical stores. Orders were assembled by medical stores and delivered to the districts as sealed packages for the individual facilities. Districts were only responsible for verifying orders from the health centres and coordinating delivery.

Health facilities in the control districts continued to receive the health centre kits that contain a set amount of drugs and supplies and other supplementary supplies using the old system where there was no formal ordering system

The following activities were done during implementation of the pilot;

- Assessments of malaria drugs, supplies and commodities systems in all 73 districts of Zambia
- Quantification for ACTs and RDTs requirements in the public sector forecasting up to 2015.
- Developing a training manual for improved drug and supply management
- Training District Health personnel and health centre personnel on drug supply

and commodity management in 16 pilot districts.

- Support supervision to all 16 districts monitoring and evaluating the pilot project.

Model B dramatically improved the drug availability in health facilities with the availability of six-pack ACT rising from 45% to 88%. Nearly double the 51% availability in control districts. The availability of SP (malaria preventive treatment for pregnant women) was 84% in pilot areas compared to 39% in the control districts. The availability of Depo-Provera (injectable contraceptive) was available for 100% of the time compared with 60% in control districts and Amoxicillin 92% compared to 63% in the control districts. Model A saw similar improvements but not to the same scale.

It is estimated that if Model B is scaled up nationwide 27,000 children could be saved from dying of malaria between now and 2015. National scale up would require a significant medium term investment but the impact could be substantial and deliver better value for money on the health investments in Zambia.

The government has now adopted Model B of the pull system for scaling up country wide in the near future.

### Case Management Leads to Geographic Plotting of Malaria and Improved Public Health Response

*Several days after case management training, Malaria Consortium staff found the health in-charge busily carrying out RDTs on dozens of fever cases. The in-charge had discovered that almost all RDT-positive cases were coming from a single village along the shore of Lake Kariba. The vast number of fever cases from other villages were testing negative. The in-charge was able to inform the District Environmental Health Technician of the fact that, far from being endemic, malaria incidence at that moment was localized and potentially epidemic. Interventions could now be targeted more effectively and efficiently to a single village and non-malaria patients could be appropriately treated. Most importantly, the in-charge now understood malaria differently, seeing it not simply as a common disease with a primarily clinical solution but viewing malaria patients epidemiologically – as geographically distinct populations to which public health solutions could be quickly and more easily applied.*

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Clover III faced considerable challenges in Zambia. Throughout 2009 and much of 2010, donors froze health assistance due to MoH mismanagement of funds. Subsequently, the MoH halted all implementation of activities at various points during the duration of the project. Additionally, from January 2010 onwards, the MoH stopped paying most staff salaries at NMCC which led to a serious decline in morale and a slow-down in the production of necessary permissions and paperwork. Also, Malaria Consortium had not previously had a dominant presence in Zambia and yet there were a number of other malaria partners who had entered the scene and claimed priority from the MoH. Clover team members spent much of the second half of 2008 building trust with the MoH, NMCC and other partners, as well as generating relationships in Eastern Province where Malaria Consortium had never worked.

**Support Sub-National Institutions:** In spite of the challenges of working through decentralized budgets and decision-making structures, primary health care is best strengthened through sub-national interventions. Clover III's main strength was its partnerships at the provincial and district-levels. Here Malaria Consortium Zambia and Clover III continually and consistently added value. Its input by design was minimal at the national level. Clover Zambia was most effective when doing work sub-nationally and it is here where most, if not all, future HSS activities should take place.

**Find National Level Policy Champions:**

At the same time, buy-in by national technical experts in Zambia is a critical component to the success of programs targeting health systems capacity. Programs need to be fully endorsed at the level of the MoH, with high-level advocates in place to ensure commitment from those at lower levels. Without this support, it is difficult to ensure that provincial, district or sub-district officials will participate constructively.

**Encourage Integrated Programming:**

HSS activities are at the mercy of the health system as a whole. Clover III was continu-

ally undermined by a) the human resources crises and b) medical supply chain constraints. Both projects had the potential to be ground-breaking interventions and were greatly appreciated and praised by district leadership. But unless all components of the health system function fluidly, and are targeted in an integrated manner, building capacity in only one or two components will only lead to short-term gains. In the future, HSS program development should clearly visualize goals, objectives, outputs and activities as being mutually-reinforcing.

**Create Infrastructure for Public-Private Partnership:**

MATFs have proven to be powerful models for implementation of malaria control and prevention activities. When successful, MATFs are mutually beneficial synergies in which both private and public sector stakeholders fully comprehend and respect the interests of the other, and put into place infrastructure to maximize their relationship. Too often, however, public sector actors either lack the legal, financial, technical and administrative capacity to manage MATFs, or the culture to fully appreciate the private sector as a 'partner', as opposed to a 'patron'.

**Improve supply of essential commodities:**

The effectiveness of the case management intervention depends on a functional and efficient supply chain of RDTs, ACTs and other essential supplies. For long term sustainability, improving DHMT – RHC linkages should be a target for support for strengthening commodity supply all the way down to the level of the user.

**Support Performance Assessments:**

PA's are vital to quality assurance of health services delivery; however there is a larger question of the sustainability of PAs if their implementation only occurs according to the occasional availability of external funds and technical support. Cooperating partners (CPs) should consider, when financing health systems strengthening, how to ensure sustainable, dependable quality assurance of health services delivery.



*Zambulance Distribution in Eastern Province*



*Monze District MATF at the district IRS Launch, Zambia August 2008*



*Community health worker conducting an RDT, Zambia 2008*

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The activities that have been done in partnership with other CPs and have been endorsed by MoH have the high potential for scale up. The systems are already established and running and need resources for their continuity.

**1. Support capacity to Use HMIS Data:** Enhancement of health information and M&E systems is a critical component of the National Health Strategy. Financing and technical support to health information systems must continue to be strengthened and expanded. Interventions targeting HMIS or M&E systems must have feedback mechanisms that allow information to flow back to the people who actually collect it, thus enabling realistic targets, monitoring, and responses to trends. Strengthening the community component of HMIS is critical to success and usefulness of the increased focus of interventions at community level

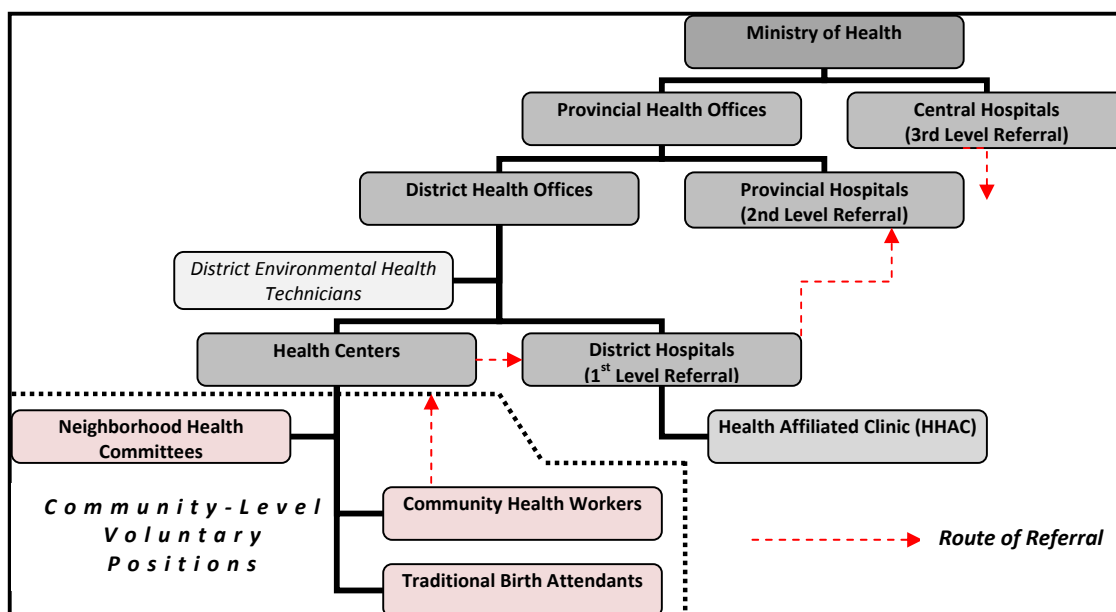
**2. District Malaria Task Forces:** As more resources become available for malaria prevention and control there is need to increase coordination of efforts to maximise benefits. MATFs have been tried and have demonstrated mixed results of their added values for mobilisation and coordination of resources, and advocacy. This effort should be examined further to improve its effectiveness. With improvements, MATFs will have a role on a larger scale.

**3. Strengthening malaria case management-malaria microscopy and RDTs**

The foundation is laid, there is more work at the community level, and there is a decreasing trend in the disease burden. It is critical to target resources appropriately to minimise wastage.

**4. Drug supply chain management –** The pull model of the supply chain which was piloted in only 16 districts and demonstrated a high level of efficiency requires funds to scale it up to countrywide to realize more impact.

Figure 2: Structure of the Zambian National Health System

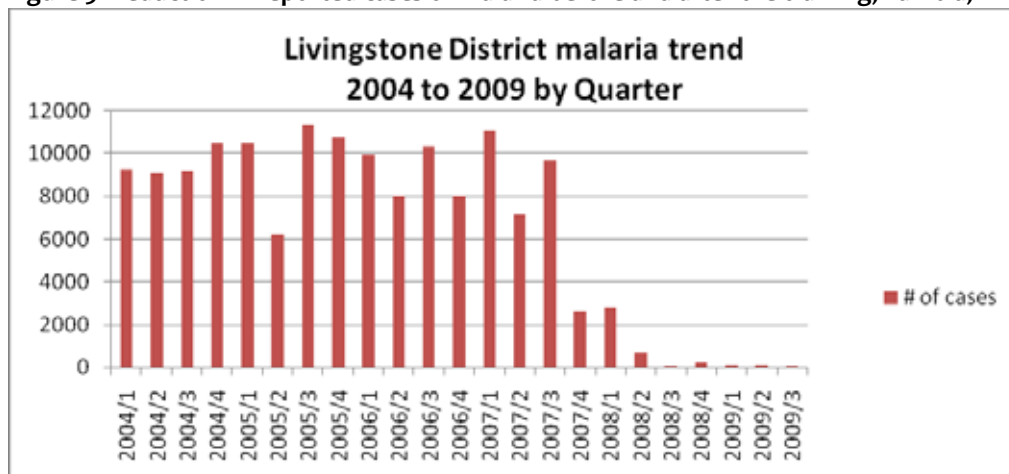




Indicators	Zambia	Eastern Province	Southern Province	Sub-Saharan Africa (average)
Total population	12.8 million	1.7 million	1.5 million	792 million
Percentage of population under the age of 15	46%	---	---	46%
Adult HIV/AIDS prevalence	***17%	---	---	***5.2%
Life expectancy at birth (years)	46	---	---	52
Physician density (per 10,000 population)	1	---	---	2
DPT/DPT-HB-Hib <sub>3</sub> coverage (latter introduced in 2006 to replace DPT)	80%	*88.4%	*87.9%	74% (DPT <sub>3</sub> coverage)
Under 5 mortality rate (per 1,000)	170	---	---	145
Infant mortality rate (per 1,000)	103	*82	*64	88
Children under 5 sleeping under insecticide-treated nets the night before the survey	****48%	****61%	****40%	****24%
Measles immunization (% 12-23 months)	85%	*89.0%	*92.0%	74%
Maternal mortality rate (per 100,000 live births)	830	---	---	900
Fertility rate (per woman)	*6.2	---	---	5.1
Contraceptive prevalence (%)	34.2%	---	---	24.4%
Births attended by skilled health personnel (%)	47%	*42.9%	*36.2%	46%
Physicians per 10,000 population	1	---	---	2
Nurses/Midwives per 10,000 population	<1	---	---	11
Population living on <\$1/day	64.3%	---	---	50.8%
Total expenditure on health as a % of GDP	6.2%	---	---	5.5%
General government expenditure on health as a % of total government expenditure	16.4%	---	---	8.7%
Private expenditure for health as a % of total expenditure on health	39.3%	---	---	52.9%
Per capita government expenditure on health	\$48	---	---	\$52

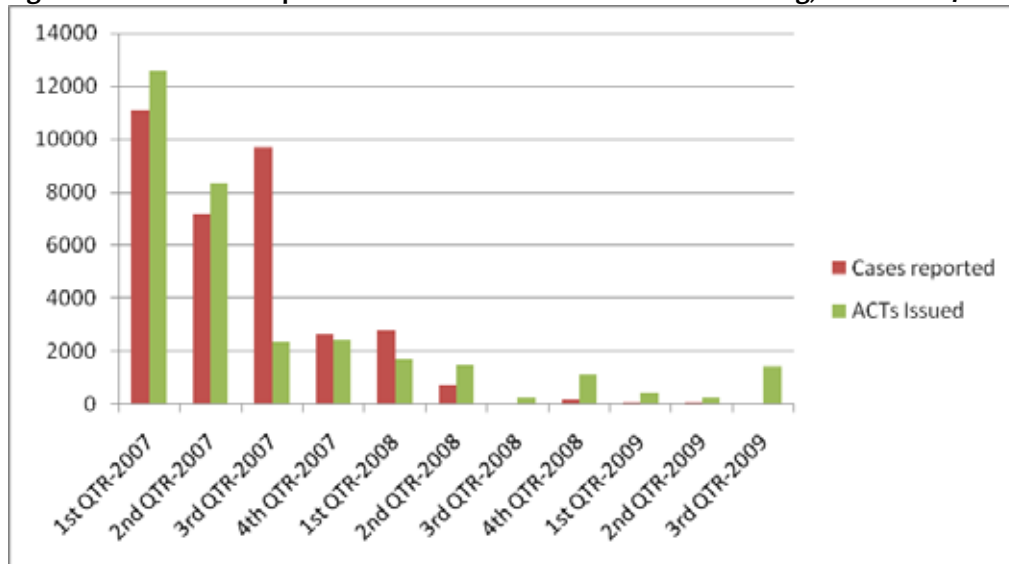
**Sources:** All statistics from World Health Organization. 2009. World Health Statistics 2009. Geneva: World Health Organization, except: \*Government of Zambia. 2008. Zambia Demographic and Health Survey 2007. Lusaka: Central Statistics Office; \*\* Government of Zambia. 2003. Summary Report 2000 Census of Population and Housing. Lusaka: Central Statistics Office; \*\* \*United Nations Department of Economic and Social Affairs Population Division. 2008. Population and HIV/AIDS 2007. [http://www.un.org/esa/population/publications/AIDS\\_Wallchart\\_web\\_2007/Population%20and%20HIV-AIDS%202007.htm](http://www.un.org/esa/population/publications/AIDS_Wallchart_web_2007/Population%20and%20HIV-AIDS%202007.htm). Accessed 3 December 2009; \*\*\*\*Government of Zambia. 2008. Zambia National Malaria Indicator Survey 2008. Lusaka: Ministry of Health; \*\*\*\*\*World Health Organization. 2009. World Malaria Report. 2009. Geneva: World Health Organization.

Figure 5: Reduction in reported cases of malaria before and after the training, Zambia, 2004-2009



Source- HMIS-Livingstone districting was done in the 4<sup>th</sup> quarter 2007

Figure 6: Reduction in reported cases of malaria and ACTs after training, Zambia 2007-2008



Source- HMIS & Livingstone district stock control cards

Table 2: Key Malaria Indicators in Zambia

Table 2: Key Malaria Indicators for Zambia			
Indicators	Zambia	Southern Province	Eastern Province
% of households with at least one net	71.5%	80.0%	77.7%
% of households with at least one ITN	62.3%	69.9%	74.8%
% of children <5 years who slept under net previous night	47.5%	69.9%	74.5%
% of children <5 years who slept under ITN previous night	41.1%	32.3%	57.3%
% of pregnant women who slept under net previous night	50.3%		48.2%
% of pregnant women who slept under ITN previous night	43.2%		46.1%
Percentage of rural households sprayed in the previous 12 months in target districts*	33.2%	53.5%	--
% of mothers who took 2+ doses IPT in the last month, with at least one during routine ANC	60.3%	56.4%	61.6%
Children <5 years with fever in previous two weeks who took an antimalarial drug	43.3%	41.2%	43.9%
Children <5 years with fever in previous two weeks who took antimalarial within 24 hours of symptom onset	29.0%	39.9%	31.9%
Children <5 years with fever in previous two weeks who sought treatment from facility within 24 hours of symptom onset	64.0%	72.0%	49.4%
Children <5 years with fever in previous two weeks who reported having heel/finger stick	10.9%	17.9%	6.9%
Malaria parasite prevalence in children <5 years**	10.2%	7.9%	9.3%
<p><b>Source:</b> Zambia National Malaria Indicator Survey 2008. Lusaka: Ministry of Health.</p> <p>*In 2008, Eastern Province was not targeted. IRS campaigns have scaled up considerably since 2008, and new districts have been targeted, including those in the East.</p> <p>**The 2010 MIS is likely to demonstrate significant rise in malaria parasitemia prevalence.</p>			

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