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DISSEMINATION WORKSHOP REPORT

An assessment of the availability of medicines and other supplies in the Lake Zone, Tanzania



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Acronyms

ACT	Artemisinin-based combination therapy
GoT	Government of Tanzania
HCW	Health care worker
HMTC	Hospital Medicines and Therapeutic Committee
IMCI	Integrated management of childhood illness
MSH	Management Sciences for Health
MoHSW	Ministry of Health and Social Welfare
mRDT	Malaria rapid diagnostic test
MSD	Medical Stores Department
NMCP	National Malaria Control Program
R&R	Reporting and requesting
SCM	Supply chain management
TACAIDS	Tanzania Commission for AIDS
THP	Tibu Homa Project
URC	University Research Co., LLC
URT	United Republic of Tanzania
USAID	United States Agency for International Development
WHO	World Health Organization

ABSTRACT

Annually, almost ten million under five children die due to febrile illnesses in the world (Jones, et al., 2003). Tanzania is among six countries with the leading malaria morbidity and mortality rates in the world (WHO, 2012). The Government of Tanzania (GoT) has put in place initiatives designed to improve febrile illnesses case management, and a number of interventions that have been designed through adopting and rolling out integrated management of childhood illness (IMCI). To add to the government's efforts to reduce morbidity and mortality rates related to febrile illnesses, the United States Agency for International Development (USAID) funded the Tibu Homa Project (THP) with the goal of reducing morbidity and mortality among children under five years due to febrile illnesses in the Lake Zone of Tanzania (Kagera, Mara, Mwanza, Geita, Shinyanga, and Simiyu regions). The Tibu Homa Project is implemented by the University Research Co., LLC (URC) in collaboration with Management Sciences for Health (MSH) and Amref Health Africa.

A baseline assessment carried out in January 2012 showed that only 11% of public facilities and 32% of private facilities had artemisinin-based combination therapies (ACTs) in stock and had not experienced stock-outs in the previous seven days. By June 2012, the proportion of facilities that had ACTs in stock rose to 75% in private facilities and 83% in public facilities. Based on the above findings, Tibu Homa set out to investigate the causes that may have contributed to the noted improvements. Similarly, some stakeholders and partners believed that these improvements were due to the project's interventions, while others noted the results were due to system-wide strengthening of the medicine supply chain in the country.

To test the hypothesis that improvements in the availability of medicines and diagnostics in the Lake Zone were due to the project's interventions, Tibu Homa compared data from facilities that received Tibu Homa support with a control group of facilities that had been identified for intervention but had not yet been reached.

The team looked at the patient records of 3,169 children under five years of age: 1,632 in facilities that had received the project's intervention, and 1,537 in the controlled facilities who were presented with fever in the four weeks prior to the survey. Data showed a significantly higher proportion of children that were treated within 24 hours after the onset of fever in the intervention facilities compared to those treated in the control facilities. Similarly, more children were tested for malaria in the intervention facilities than the control facilities.

Study findings also indicated that the availability of febrile illness medicines and supplies was better in facilities supported by Tibu Homa compared to those not supported by the project. Intervention facilities were 4.5 times more likely than those in the control group to have five or more key febrile-illness related medicines in stock on the day of the visit and were 2.9 times more likely than those in the control group to have 10 or more tracer medicines available. Therefore, this study has demonstrated that the project's interventions have improved availability of medicines and supplies in the supported facilities in the Lake Zone regions of Tanzania.

I. INTRODUCTION

Globally, malaria and other febrile illnesses have been reported to be the major source of deaths to more than 10 million children under five years every year (Jones et al., 2003). In Approximately 90% of these deaths occurred in Africa alone, and all of them were reported to be children under the age of five years in the year 2010 (WHO, 2012). Tanzania is among the six high-ranked countries in the world with high numbers of deaths and prevalence of febrile illnesses among under five children (WHO, 2012). The underlining problem varies within the regions of Tanzania, and the prevalence in Mwanza was reported to lead other regions (more than 18%) among children aged 6-59 months in 2011/2012 (TACAIDS et al., 2013).

Previous studies have revealed that there have been over diagnoses and treatment of malarial cases of children under five years, while other febrile illnesses have been neglected (Reyburn et al., 2004). The Government of Tanzania (GoT) has initiated some efforts aimed at improving case management of children through adopting and rolling out integrated management of childhood illness (IMCI) in 1998 (URT, 2004).

The Tibu Homa Project (THP) has been designed to contribute to the on-going efforts of the Government to improving case management of children under five suffering from febrile illnesses in the Lake Zone regions of Tanzania (Mwanza, Mara and Kagera). The project is funded by the United States Agency for International Development (USAID) and is jointly implemented by the University Research Company (URC), Management Sciences for Health (MSH) and Amref Health Africa. The project also works collaboratively with the Government of Tanzania through the Ministry of Health and Social Welfare (MoHSW), local partners such as Regional and Council Health Management Committee teams, and the private health sector.

The primary goal of the project is to reduce mortality and morbidity of children under five years suffering from febrile illnesses through the following interventions:

1. Increase availability of and accessibility to basic facility-based curative and preventive child health services,
2. Ensure sustainability of critical child health activities, and
3. Increase linkages within the community to promote health behaviors, thereby increasing knowledge and use of child health services and appropriate referral.

The Tibu Homa supply chain management (SCM) team has been tasked with improving case management through increasing availability and accessibility of effective medicines and supplies related to febrile illnesses at the health facilities. The key intervention that the SCM team implemented to reach the above objective was to train health care workers (HCWs) on supply chain management. Specifically, these HCWs from regional, district or private hospitals and lower level facilities were trained on the proper documentation of consumption data, the proper filling of reporting and requesting (R&R) forms, timely submission of R&R forms, rational use of medicines, and inventory management. By the same token, the teams also trained health managers at the regional and district levels on how they can facilitate and conduct mentorship on logistics management aimed at HCWs. Additionally, the team revitalized and monitored the functionality of medicines and therapeutic committees from hospitals and primary health care facilities in the Lake Zone.

At the time of the assessment, the project had already reached and intervened in 34 hospitals out of 39 hospitals in the Lake Zone regions. The project designed two indicators to track the progress of the interventions, which were: 1) percentage of health facilities reporting no stock-out of key commodities (ACT and malaria rapid diagnostic tests) during the reporting period, and 2) the proportion of facilities stocked with a tracer list of essential first-line medicines and supplies at the time of visit.

The baseline data of January 2012 indicated that 11% of the public facilities and 32% of private health facilities had ACTs in stock and had not had stock-outs in the seven days prior to data

collection. By June 2012, the project data had shown a significant improvement on the above indicators in both public (75%) and private (83%) health facilities supported by the project. Similarly, the National Malaria Control Program (NMCP) assessment (not yet published) revealed that ACTs were readily available at facilities supported by Tibu Homa.

The above improvements have raised questions on whether they were due to the project's interventions or not. Similarly, other stakeholders and partners wanted to know the true factors that contributed to the aforementioned achievements of the Tibu Homa Project. The project then designed an assessment to test the hypothesis that the improvement in the availability of medicines and supplies related to febrile illnesses in the Lake Zone were due to the interventions conducted by Tibu Homa Project. This assessment specifically focused on the following objectives:

1. Determine the proportion of children under five presented with fever who were appropriately screened with RDT and treated within the last 30 days.
2. Ascertain the number of facilities with staff trained in medicine and supply chain management.
3. Determine day-of-visit availability of essential (tracer) medicines and diagnostics for malaria at health facilities in the Lake Zone.
4. Determine the proportion of facilities with a functional system in place for forecasting and requisitioning of medicines and other supplies.
5. Assess functioning of Hospital Medicines and Therapeutic Committees (HMTCs).

II. METHODOLOGY

The methodology used for this assessment was a matched case-control study design where cases were defined as facilities that received project interventions and the control group was a samples of facilities that had been identified for intervention but had not yet received any project interventions in the Lake Zone regions. Public and private hospitals were randomly selected as cases in the three regions which received support by the project. The comparison groups were public and private hospitals from Shinyanga Region, as well as Mwanza Hospital and Chacha Florian Hospital from Mwanza Region.

One to one matching was done between private health centers and dispensaries. Cases were from all private health centers and dispensaries in supported regions, and controls were equal in number of private health centers and dispensaries within the region that were closest geographically to the intervention facilities. This also enabled more control of geographical factors that could affect the availability of essential medicines and supplies.

One to one matching was also done in public health centers and dispensaries. Cases collected were a random sample of public primary health facilities that received the project's intervention, and the control group was an equal number of public primary health facilities that were closest geographically to the cases.

Eventually, 8 hospitals (6 private, 2 public), 19 health centers (9 private, 10 public) and 26 dispensaries (13 private, 13 public) were selected for the study as cases. The distribution of primary health facilities was proportionate to the number of facilities reached by the project in each region, resulting in the selection of 6 health centers in Kagera, 5 in Mara, and 8 in Mwanza. At the same time, 8 dispensaries in both Kagera and Mara and 10 in Mwanza were selected.

Questionnaires were developed and modified from those used for the Tibu Homa baseline study, which was based on the project results framework, i.e., patient care and medicine use, health workers training, inventory management, and management support and sustainability. The data collectors used in the study received two days training to familiarize themselves with the forms and interviewing techniques. They were evaluated on their

interpersonal communication skills and knowledge of the organization and local health system. Similarly, their training was aimed at equipping them with the knowledge and experience in medicines, pharmacy and nursing so as to collect valid and reliable data. Data quality control was done to ensure the integrity and management of data. The data was entered using Epidata software. For consistency and minimizing errors, cleaning and analysis was done using STATA software.

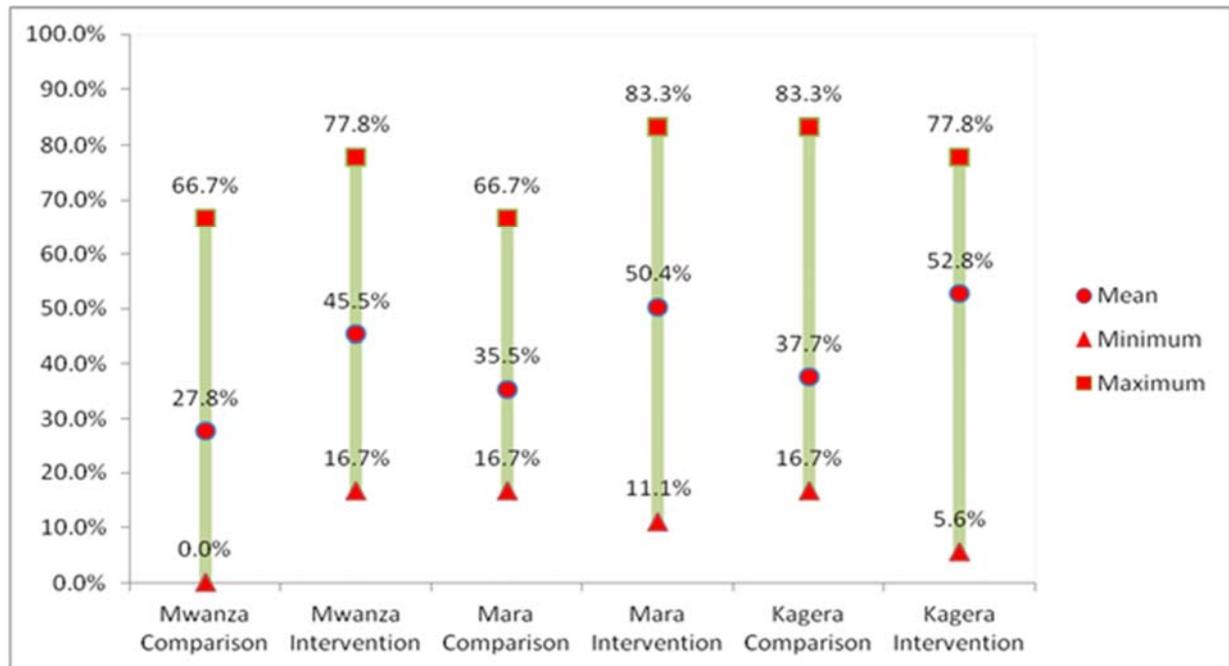
III. RESULTS

A total number of 108 health facilities (55 cases, 53 controls) were surveyed, with 134 health care workers (134 cases, 0 control) trained by Tibu Homa Project on medicine and supply chain management. Of the 55 cases, 14 (25.5%) had only one trainee, 22 (40.0%) had two trainees, while 15 (34.5%) had more than three health care workers trained on medicine and supply chain management.

A total of 3,169 under-five children (1632 cases, 1537 controls) who presented with fever in the facilities surveyed in the last four weeks prior to this survey, had their patient records reviewed to assess patient care and medicine use. A significantly higher proportion (cases, 26.6%, and control group, 8.1%) of under-fives with fever were treated within 24 hours after the onset of fever in the intervention facilities compared to those treated in the comparison facilities. Similarly, cases were 5.3 times more likely than those in the control group to have screened patients for malaria parasites using either microscopy or malaria rapid diagnostic test (mRDT).

Almost 27.5% of facilities in the controls and 10.9% in the cases had at most four essential medicines and mRDT; 56.9% in the controls and 52.7% in the cases had between 5-9 essential medicines; and 15.7% in the controls and 36.4% in the cases had more than 10 essential medicines. In the crude analysis, cases were 4.5 times more likely than those in the control group to have five or more tracer medicines on the day of visit. Similarly, cases were 2.9 times more likely than those in the control group to have ten or more tracer medicines.

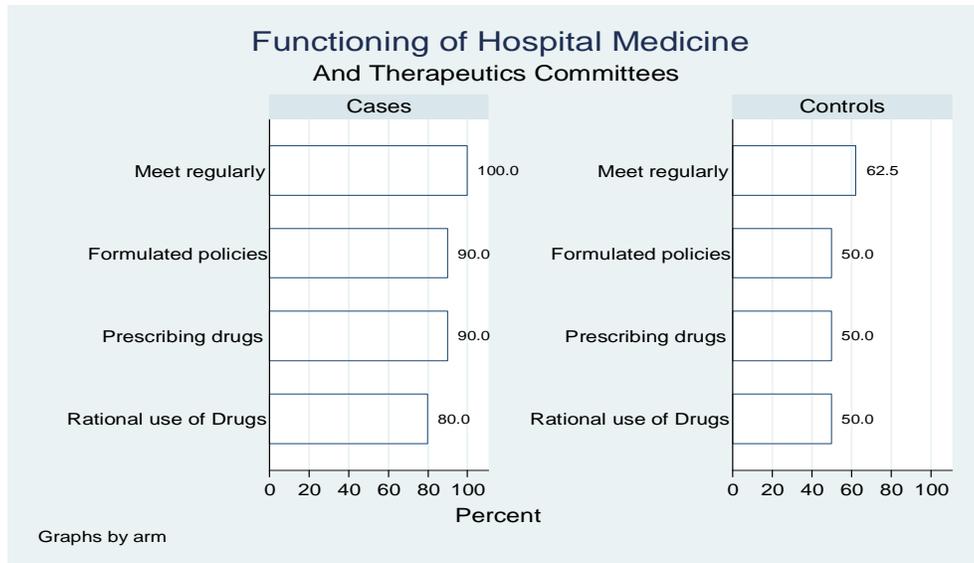
Figure 1: Availability of Essential Medicines on the Day of Visit



Functioning of Hospital Medicine and Therapeutic Committees

To assess the functions of the hospital medicine and therapeutic committees, four indicators were used in the assessment (see Figure 2). All (100%) hospitals selected as cases met regularly (quarterly or monthly) to discuss medicine and therapeutic issues, while only 63% of the controls met regularly. Similarly, almost 90% of the committees among cases had developed some kind of medicine and therapeutic policy documents, and a similar proportion had developed standard documents for prescribing drugs, while only 50% of the control facilities had developed the same documents.

Figure 2: Functioning of Hospital Medicine and Therapeutic Committees



IV. DISCUSSION

Parasitological confirmation has always been recommended by WHO (2012) for suspected cases of malaria before treatment in malaria endemic countries in Sub-Saharan Africa. The reliability of malaria RDT results is essential to ensure the safety of withholding anti-malarial treatment in test negative patients (Bisoffi et al., 2010; Moranker et al., 2011). The assessment showed a high proportion of children with fever tested for malaria using RDT in cases compared to the control group, which led to low use of ACTs in patients tested negative in case facilities. However, a large number of antibiotics were being prescribed in case facilities as a result of unclear treatment decisions for RDT-negative patients; it appeared that HCWs may consider a bacterial diagnosis after a negative malarial result. In support of the findings, one of the studies in Tanzania has shown an increase of anti-bacterial treatment after the introduction of RDT. One of the strategies in the primary control of uncomplicated malaria is the timely diagnosis and treatment using ACTs (Bastiaens et al., 2011; D'Acromont et al., 2011). ACTs has been recommended as the first line drug of choice for uncomplicated malaria in Tanzania and other sub-Saharan countries (Nyunt & Plowe, 2007). Apart from that, reported complications due to malaria and transmission can be rapidly and effectively controlled if effective treatments are taken within 24-hours of onset of clinical signs and symptoms (Greenword et al., 1991).

This study has revealed that 28% of children under five years seen in the case facilities were diagnosed and treated within 24 hours on the onset of fever, compared to 8% of children seen in the control group. However, more efforts are still needed to increase timely access to quality medicines to reduce risk of poor treatment outcomes, as the results show a

proportion fall short of the 80% target set for timely access (treatment within 24 hours of the fever onset) by the Roll Back Malaria Partnership in order to reduce malaria by 50% (Alba et al., 2010).

Results showed almost 27.5% of controls and 10.9% of cases had at most 4 essential medicines and mRDTs; 56.9% of controls and 52.7% of cases had between 5-9 essential medicines and supplies; and 15.7% of controls and 36.4% of cases had 10 or more essential medicines and supplies. Sources of supply and health budget allocations were not causes for the underlined results as the cases and controls had the same supplier, i.e., the Medical Stores Department (MSD), regional or district stores. Similarly, all facilities were randomly selected including those with lower health budget allocations in both cases and controls.

There was a demand factor which could clarify the above increases. Quantification skills and documentation and use of consumption data during forecasting of quantity to place orders at MSD or district stores could affect the availability of essential medicines and supplies at the facilities. A number of interventions by the Tibu Homa Project, such as training HCWs on proper quantification, inventory management, and documentation of consumption data, helped facilities to pull essential commodities from MSD.

In this assessment, almost three-quarters of the facilities surveyed had mRDT out of stock. Reasons for stock-outs and duration of stock-outs were not collected. However, a previous national survey showed that a mismatch between quantity of essential medicines delivered to health facilities and the order requested, errors in forecasting, unavailability of funds, and delay in delivering the consignment, were among the reasons for stock-outs (URT, 2009).

In the case facilities, the data showed that 90% of Hospital Medicines and Therapeutic Committees (HMTCs) were meeting regularly and had developed hospital medicine and policy documents and standards for prescribing medicines. Revitalization of HMTCs as one of the project interventions has helped hospital HCWs to ensure that they understood their roles and functions in overseeing essential medicines and supplies. This is particularly important because it would ensure rational use of medicines and cost-effective solutions to many health problems in the Lake Zone regions and other regions in Tanzania.

V. CONCLUSION AND RECOMMENDATIONS

From the findings above, we can conclude that a high proportion of children under five years were tested for malaria parasites and received treatment interventions within 24 hours of onset of fever among cases compared to children in a control group. Likewise, the number of cases with antimalarial medicines was high compared to the control group. A high percentage of hospitals in the intervention group were functional and met regularly to discuss issues related to rational medicines use and their availability. However, in both intervention and control groups, most of the facilities continued to experience stock-outs of mRDTs at the time of the visit. This indicates that the diagnostics were either presumptive or based on microscopy.

It is recommended that the Tibu Homa Project further explore more methods or interventions to improve the availability of essential medicines and supplies at the facilities. This will ensure that when these commodities are stocked out at MSD, local purchasing methods can be used to ensure their availability.

The study also found an overuse of antibiotics prescribed to children with fever tested mRDT or microscopy-negative. Eventually, this could lead to antibiotic resistance among children under five years attended at the facilities. To resolve the issue, Tibu Homa should circulate more guidelines for standard treatment and train more HCWs who manage children under five years using IMCI.

Finally, Tibu Homa needs to put more effort into mobilizing communities to increase timely access (i.e., within 24 hours of onset of fever) to quality ACTs. The community mobilization

strategy should impart knowledge to the communities and empower them to develop local responses as well as improve linkages between communities and health facilities.

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