DISSEMINATION WORKSHOP REPORT

Tibu Homa Program experiences in improving evidence-based treatment of malaria in the Lake Zone

SEPTEMBER 2014

This technical report was prepared by University Research Co., LLC (URC) for review by the United States Agency for International Development (USAID) and authored by Dr. Kristina Lugangira of URC under The USAID Diagnosis and Management of Severe Febrile Illness (Tibu Homa) Program. The Tibu Homa Program is managed by URC under Cooperative Agreement No. 621-A-00-11-00011-00 and is made possible by the generous support of the American people through USAID.

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Acknowledgements

The USAID Diagnosis and Management of Severe Febrile Illness (Tibu Homa) Program would like to acknowledge all of the people who contributed to improving the evidence-based treatment of malaria in the Lake Zone. The implementation of the health facility case management improvement work was supported by the American people through the United States Agency for International Development (USAID) and by the Ministry of Health and Social Welfare (MoHSW) of the United Republic of Tanzania and the respective Regional Health Management and Council Health Management Teams.

The Diagnosis and Management of Severe Febrile Illness (Tibu Homa) Program is made possible by the generous support of the American people through the United States Agency for International Development (USAID) and is implemented under Cooperative Agreement Number AID-621-A-00-11-00011-00. The program team includes prime recipient, University Research Co., LLC (URC), and sub-recipients Management Sciences for Health (MSH) and Amref Health Africa. The program was supported by the USAID Tanzania Mission whose strategic objective is to improve the health status of Tanzanian families with a development objective of Tanzanian women and youth empowered.

Recommended citation:

Lugangira K. 2014. Tibu Homa Program experiences in improving evidence-based treatment of malaria in the Lake Zone. *Dissemination Workshop Report*. Published by the Tibu Homa Program for the United States Agency for International Development. Mwanza, Tanzania: University Research Co., LLC.

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Acronyms

ACT	Artemisinin-Based Combination Therapy
CHMT	Council Health Management Team
CM	Case management
CSS & M	Comprehensive Supportive Supervision and Mentorship
HCW	Health Care Workers
HMIS	Health Management Information System
IMCI	Integrated management of childhood illness
MoHSW	Ministry of Health and Social Welfare
MSD	Medical Store Supplies
mRDT	Malaria rapid diagnostic test
MSH	Management Sciences for Health
PQIT	Pediatric quality improvement teams
RCH	Reproductive and Child Health
RCM	Referral Care Manual
RHMT	Regional Health Management Team
THP	Tibu Homa Program
TSH	Tanzanian shillings
URC	University Research Co., LLC
USAID	United States Agency for International Development
WHO	World Health Organization

ABSTRACT

Malaria continues to be a major killer of under-fives, and Tanzania has set strategies to reduce malaria in the country. To complement and support government efforts to reduce morbidity and mortality of under-fives, in 2011 the United States Agency for International Development (USAID) created the Tibu Homa Program (THP) to improve diagnosis and treatment of febrile illnesses among children under five years of age in the Lake Zone of Tanzania. THP is led by University Research Co., LLC (URC) working in partnership with Amref Health Africa and Management Sciences for Health (MSH).

THP is operational in 28 districts of six regions in the Lake Zone: Kagera, Mwanza, Geita, Mara, Shinyanga, and Simiyu. Studies have shown that despite introduction of malaria rapid diagnostic tests (mRDT), presumptive treatment of malaria and non-adherence to test results is still practiced in Tanzania (URT 2008; Mubi et al. 2013). Therefore, in order to improve quality of care, the program included among other improvement activities, capacity building in malaria testing and treatment according to national policy. This paper reports on the THP experience in improving malaria testing so as to improve case management among children under five years of age during the period 2012-2014.

In order to improve malaria case management, the Tibu Homa Program provided training in:

- Quality improvement to health care workers who formed health facility pediatric quality improvement teams (PQITs)
- Use of mRDTs
- Case management using national guidelines
- Supply chain management to ensure constant availability of essential items
- Data management to enable teams to collect, analyze, and make decisions
- Supportive supervision and mentorship to Regional and Council Health Management teams (RHMTs and CHMTs).

Together with RHMT and CHMT staff, Tibu Homa logistic and clinical mentors conducted monthly supportive supervision and mentoring to the PQITs.

Classroom training combined with on-job training through monthly supportive supervision resulted in increased malaria testing rates of under-fives presenting with fever and a change in clinical practice towards adherence to national updated guidelines. Of the malaria-positive under-fives, 90% received proper treatment.

The work shows that trained health care workers applying improvement methods and receiving regular supportive supervision and mentorship can increase malaria testing before treatment and change clinical practice towards adherence to clinical management indicated by test results.

I. INTRODUCTION

Although the overall under-five mortality rate is declining in Tanzania in the past 10-15 years, malaria continues to be a major killer of under-fives (URT 2008; Mmbando et al. 2010). Nevertheless, with control efforts, malaria has been reduced significantly as demonstrated by population-based studies that indicate a decline in overall malaria prevalence among under-fives, from 18.1% in 2008 to 9.7% in 2012 (TACAIDS et al. 2013).

The World Health Organization's (WHO) integrated management of childhood illness (IMCI) strategy provides evidence-based guidelines for managing ill children in health facilities lacking sophisticated diagnostic equipment (Gove 1997). Health workers used IMCI guidelines to assess children's condition and classify illness on the basis of simple clinical symptoms and signs. Using these adapted guidelines in malaria-endemic areas, every child under five years of age with fever was assumed and treated presumptively for malaria.

In 2006, artemisinin-based combination therapy (ACT) was introduced by the Ministry of Health and Social Welfare (MoHSW) in Tanzania in 2006 as the first line anti-malaria drug. To improve targeting of anti-malarial drugs, WHO now recommends that use of ACT be confined to laboratory-confirmed cases only (WHO 2010). The use of parasite-based diagnosis allows better targeting of anti-malarial drugs and also provides an opportunity for other causes of fever to be identified and appropriately treated (Lubell et al. 2008). The availability of malaria rapid diagnostic tests (mRDTs) offers a good opportunity to extend parasitological confirmation of malaria infection to peripheral areas where quality microscopy cannot be guaranteed.

In 2010, Tanzania adopted the new WHO updated guidelines and began rolling out universal testing for all children with fever. It was during this period that the United States Agency for International Development (USAID) created the Tibu Homa Program (THP) to improve diagnosis and treatment of febrile illnesses among children under five years of age in the Lake Zone of Tanzania. THP is led by University Research Co., LLC (URC) working in partnership with Amref Health Africa and Management Sciences for Health (MSH).

Anti-malaria prescription to children with malaria-negative test results and those not tested is still practiced in Tanzania, despite the universal malaria testing policy. One study conducted to assess differences of diagnosis and treatment of malaria before and after introduction of the updated WHO guidelines on malaria concluded that a high proportion of smear-negative patients were diagnosed with malaria and treated with anti-malarials (Moon et al. 2014). Another study with similar findings recommended the need for interventions to improve clinical management of febrile illnesses (Mmbando et al. 2010).

A baseline survey conducted by Tibu Homa in 2011 (unpublished), revealed that the presumptive treatment of malaria leads to over-diagnosis, irrational treatment, and possible missed opportunities to detect and treat other causes of febrile illnesses in children, similar to findings from other studies as mentioned above. The survey found that malaria treatment was not according to national policy and that in general, there was low compliance with IMCI guidelines. It was also noted that the Health Management Information System (HMIS) register did not provide space for documenting under-five children with fever and malaria testing results. Clinical and logistic mentorship were found to be infrequent.

II. METHODOLOGY

THP is operational in 28 districts of six regions in the Lake Zone: Kagera, Mwanza, Geita, Mara, Shinyanga, and Simiyu. The interventions instituted by the Tibu Homa Prgram in selected health facilities in these districts focused on improving testing and treatment according to national policy and included the following:

- Established 396 pediatric quality improvement teams (PQITs) in selected health facilities and trained team members in case management and quality improvement.

The PQIT members in turn transferred their knowledge to their fellow staff. These teams developed problem-solving skills and assumed roles to change practices and care processes in their respective facilities. They identified problems, quality improvement gaps, causes that are responsible for the gaps identified, and tested and implemented changes that were proven to work. They also monitored their progress on a monthly basis and shared results with other teams during peer-to-peer learning sessions. Changes these teams introduced in their facilities included:

- Introduced columns in the HMIS register to improve documentation of all cases of fever and mRDT/microscopy results.
- Assigned members of PQITs and other health care workers to be responsible for checking that correct documentation is done in respective registers.
- Redesigned patient flow to reduce patient waiting time
- Developed multiple testing locations within the facility to reduce overcrowding of patients at one location.
- Shifted the task of testing to nurses and clinicians where laboratory staff were inadequate.
- Introduced a duty roster for testing sites during weekends and public holidays.

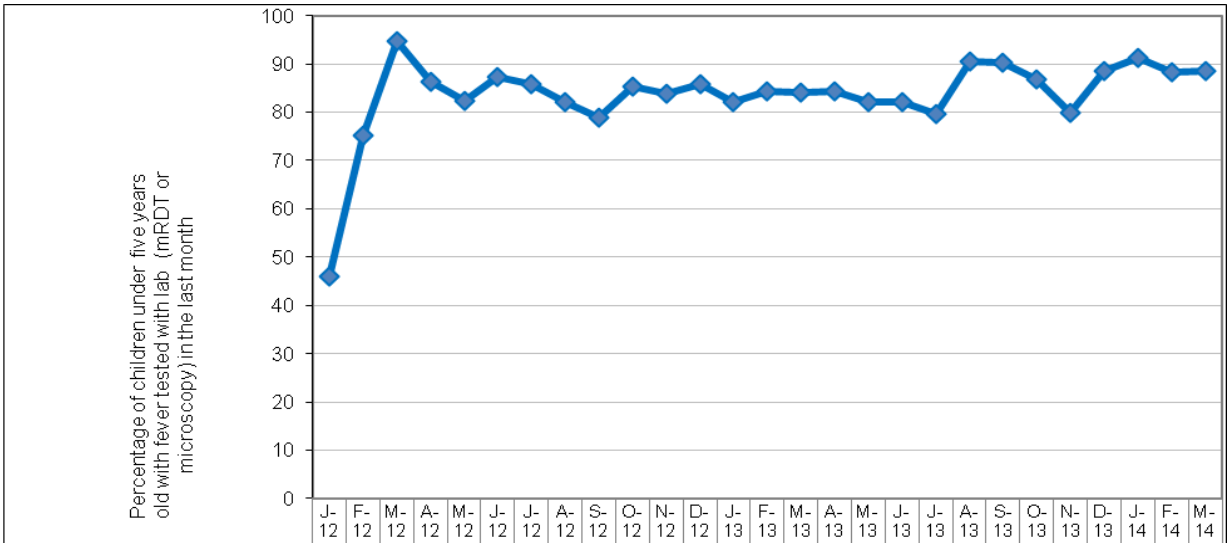
- Built capacity of Regional Health Management Teams (RHMTs) and Council Health Management Teams (CHMTs) to support health facility improvement teams to implement case management improvement activities through comprehensive supportive supervision mentorship (CSS &M). Mentorship included logistic and clinical. By June 2014, 138 health care workers (HCW) had been trained in clinical mentorship and 213 HCW in supportive supervision.
- Trained 975 health care workers on IMCI in primary health facilities and in the use of the Referral Care Manual (RCM) in hospitals.
- Trained 237 facility health workers in the use of mRDT to ensure alignment with the National Malaria Control Program roll out of mRDT and microscopy.
- Strengthened facility-based information systems through regular data quality audits.

III. RESULTS

In the assisted sites, the malaria testing rate has increased from was observed to be increasing from 46% in January 2012 to 89% in March 2014 (see Figure 1). As shown in Figure 2, the percentage of children under five with positive malaria results that received correct anti-malaria medicine generally remained above 90%.

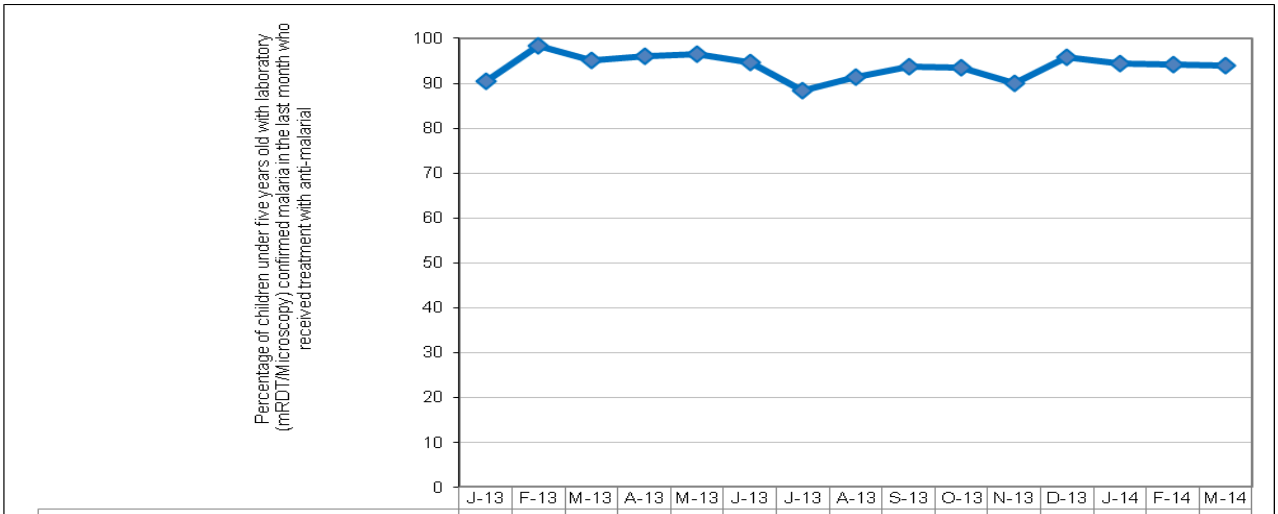
THP also gathered data to show the cost savings associated with eliminating or reducing anti-malarial treatment of children who were found to have a negative parasitological test for malaria. Table 1 shows under-fives with fever presenting to Nyegezi Dispensary, Mwanza, who received a parasitological test for malaria during the period May 2013 through June 2013 and the number who were found to have positive and negative malaria diagnostic test results, respectively. The table shows the number of doses of anti-malarial drugs saved by avoiding presumptive treatment (except for the months of January and June 2013, when presumptive treatment was necessitated due to shortage of mRDTs), which totaled doses for 959 children from May 2013 through June 2013. For the 959 patients with negative results, at TSH 1000 per course of Artemether Lufamentrine, TSH 959,000 was saved by the MoHSW.

Figure 1: Percentage of children under five years old with fever tested with mRDT or microscopy in the past month in THP-assisted sites in Mwanza, Mara, and Kagera regions, January 2012–March 2014



	J-12	F-12	M-12	A-12	M-12	J-12	J-12	A-12	S-12	O-12	N-12	D-12	J-13	F-13	M-13	A-13	M-13	J-13	J-13	A-13	S-13	O-13	N-13	D-13	J-14	F-14	M-14
# of children U5 w/ fever tested w/ lab (mRDT or microscopy)	455	603	2241	3142	4517	5080	1357	1265	9345	1187	1140	1207	2646	3592	2755	2600	2897	2875	2280	1883	1675	2055	1983	2245	2994	2932	2529
Total # of children U5 w/ fever attending facility	987	803	2364	3637	5479	5813	1583	1541	1183	1390	1358	1409	3223	4257	3280	3087	3534	3502	2867	2078	1855	2366	2481	2540	3278	3324	2857
% of children U5 w/ fever tested w/ lab (mRDT or microscopy)	46	75	95	86	82	87	86	82	79	85	84	86	82	84	84	84	82	82	80	91	90	87	80	88	91	88	89
# of Sites Reporting	4	4	15	31	34	29	70	75	82	91	106	94	163	175	173	174	173	167	169	170	169	175	160	171	170	171	170

Figure 2: Percentage of children under-five years old with laboratory (mRDT/microscopy) confirmed malaria in the last month who received treatment with anti-malarial according to national policy in 163 sites in Mwanza, Mara and Kagera Regions in Tanzania, January 2013 – March 2014



	J-13	F-13	M-13	A-13	M-13	J-13	J-13	A-13	S-13	O-13	N-13	D-13	J-14	F-14	M-14
# of children U5 w/ fever w/ lab confirmed malaria (mRDT or microscopy) who received treatment with anti-malarial	9208	9540	9273	11662	12914	11009	3737	2588	2636	2854	2618	2678	3093	2909	2622
# of children U5 w/ fever w/ lab confirmed malaria (mRDT or microscopy)	10186	9689	9757	12130	13387	11621	4229	2832	2816	3052	2912	2793	3272	3087	2794
% of children U5 w/ lab (mRDT/Microscopy) confirmed malaria who received treatment w/ anti-malarial	90	98	95	96	96	95	88	91	94	94	90	96	95	94	94
# of Sites Reporting	131	109	148	158	154	130	142	144	163	160	147	149	163	160	147

Table 1: Number of children under-five with fever who received ACT beginning May 2012 to June 2013 Nyegezi Dispensary, Mwanza

	Malaria Positive	Treatment (ACT)	Malaria Negative	Treatment (ACT)
May 2012	71	71	68	0
Jun	78	78	26	0
Jul	13	13	85	0
Aug	40	40	63	0
Sep	69	69	28	0
Oct	75	75	35	0
Nov	69	69	10	0
December	80	80	6	0
Jan 2013	104	104	0	
Presumptive treatment		23		
Feb	75	75	49	0
March	25	25	112	0
April	82	82	58	0
May	108	108	32	
June	62	62	23	0
Presumptive treatment		18		
Total	**951**	**992**	**959**	**0**

IV. DISCUSSION

There has been significant reduction in malaria nationwide, but malaria is still a leading cause of outpatient and inpatient deaths in under-five children. A range of interventions have been put in place to prevent and treat malaria (TACAIDS et al. 2013). Part of the strategy includes prompt and proper diagnosis and treatment. Malaria rapid diagnostic testing was introduced in Tanzania country-wide in lower primary health facilities where microscopy was not readily available to aid access to testing. With the updated WHO guidelines, malaria treatment has changed from presumptive to targeted anti-malarial treatment, and other causes of fever should be identified and treated appropriately. However, anti-malarial prescription for children with malaria-negative results and those not tested is still practiced in Tanzania, despite the policy of universal malaria testing before treatment introduced between 2010 and 2012.

Other studies (Moon et al. 2014; Mmbando et al. 2010) have attributed non-adherence to malaria test results as largely due to lack of trust in mRDT by clinicians resulting from traditional belief in microscopy being a gold standard, lack of knowledge on specificity and sensitivity of the tests, and unreliable results due to inadequate quality assurance measures. Most facilities do not offer 24-hour laboratory services because of lack of testing on weekends and public holidays, heavy workload at testing sites, inadequate staff with testing skills, recurrent stock-outs of test kits at the Medical Stores Department (MSD), (the sole

supplier), or lack of electricity. Clinicians have also found themselves giving in to patient pressure to provide treatment despite negative malaria results.

In order to overcome these hurdles to quality case management, THP addressed health care worker knowledge gaps in two areas: malaria testing and malaria treatment.

Malaria Testing

The results show increased access to malaria testing as shown by 175 reporting sites (Figure 1). Health care workers were provided with malaria rapid diagnostic testing skills so as to ensure availability of service at all times (at least two HCWs per facility received appropriate training in use of mRDT). The program went further to help the pediatric quality improvement teams to establish multiple testing points in a number of health facilities (Reproductive and Child Health, inpatient department, clinician consultation room, etc.) so as to give testing priority to children and reduce waiting time.

Supply chain management training gave HCWs skills to manage stock-outs of essential items thus ensuring availability of service. Even with fluctuations in the availability of mRDT at the MSD from May through September 2013, health facilities used other coping strategies, i.e., requesting from nearby health facilities, using mRDT only for children, etc., to keep the testing rate above 80%.

Malaria Treatment

The results also show that THP-support sites improved prescribing based on laboratory results (Figure 2). HCWs were guided on how to use test results and provided with various guidelines and job aids that provide guidance on how to identify, treat other causes of fever, and counsel patients appropriately, including the adapted IMCI guideline, RCM for hospitals, National Malaria Management Policy, and IMCI chart booklets. Clinicians' prescribing practices have changed significantly, resulting into less presumptive treatment. Malaria-negative cases are treated for other causes of fever as provided for in the adapted IMCI guideline.

Furthermore, through monthly supportive supervision and mentorship, THP has managed to induce change in adherence of clinicians to test results and to ensure reliable results. The supportive supervision team has a laboratory person to support the facility staff to implement laboratory quality assurance measures. The established PQITs are monitored to ensure that improvement in care processes are maintained.

Table 1 as an example shows how treating according to results saves patients from receiving unindicated medications and reduces costs on what would be wasted medicines. Data from just one facility showed how TSH 979,000 per year was saved by not treating negative results with anti-malarial medicines.

V. CONCLUSION AND RECOMMENDATIONS

Improving skills of health care workers in case management, supply chain management, and mRDT use and changing health care worker perceptions on negative results are key to ensure every child with fever is tested and that children found not to have malaria are appropriately evaluated and treated for other causes of fever. Malaria RDT quality assurance should be incorporated in routine supportive supervision and mRDT data should be tracked in registers so as to ensure quantification of supplies and ensure that mRDTs are performed on intended patients.

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