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CHALLENGE TB



Challenge TB – South Sudan

Year 1

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Cover photo: Training of Laboratory Technician on the use and maintenance of the LED microscope

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List of Abbreviations and Acronyms

AAA	Arkangelo Ali Association
AIDS	Acquired Immunodeficiency Syndrome
ART	Antiretroviral Therapy
CBO	Community Based Organization
CCM	Country Coordination Mechanism
CHD	County Health Department
CPT	Cotrimoxazole Preventive Therapy
CSO	Civil Society Organization
CTRL	Central TB Reference Laboratory
DOTS	Directly Observed Treatment Short Course
DR-TB	Drug Resistant TB
DST	Drug Susceptibility Test
EPI	Epidemiological analysis
EQA	External Quality Assurance
GDF	Global Drug Facility
GF	Global Fund
GLC	Green Light Committee
HCW	Health care workers
HIV	Human Immunodeficiency Virus
HSS	Health Systems Strengthening
IC	Infection Control
IDP	Internally Displaced Persons
IOM	International officer for Migration
IPT	Isoniazid Preventive Therapy
JTH	Juba Teaching Hospital
KNCV	KNCV Tuberculosis Foundation
M&E	Monitoring and Evaluation
MDR-TB	Multi Drug Resistant Tuberculosis
MOH	Ministry of Health
MSH	Management Sciences for Health

NFM	New Funding Model
NGO	Non-governmental Organization
NSP	National Strategic Plan
NTP	National TB Program
OR	Operational Research
PHCC	Primary Health Care Center
PMDT	Programmatic Management of Drug Resistant TB
SRL	Supranational Reference Laboratory
TB CAP	Tuberculosis control assistance program
TB CARE I	TB Collaboration and Coordination Access to TB Services for All People Responsible and Responsive Management Practices Evidence-Based Project
TB	Tuberculosis
TBCTA	TB Coalition of Technical Assistance
TFM	Transition Funding Mechanism
TOT	Training of Trainers
USAID	United States Agency for International Development
USD	United States Dollar
VCT	Voluntary Counselling and Testing
WHO	World Health Organization

1. Executive Summary

Challenge TB (CTB) is a five-year program funded by the United States Agency for International Development (USAID) and is implemented by lead partner KNCV Tuberculosis Foundation (KNCV), and other consortium partners. Management Sciences for Health (MSH) is the lead implementing partner in South Sudan. The total buy-in for year one is USD \$ 2,382,992. CTB focuses on improving patient-centered quality TB services, developing country specific evidence based strategies to achieve high impact results, building local capacity and the utilization of innovations and new technologies to move forward in the global fight against TB. In its first year, the South Sudan CTB project has focused on four sub-objectives: Enabling environment; Comprehensive high quality diagnostic network; Patient-centered care and treatment; and political commitment and leadership. The key results are highlighted below:

Access to TB services for the displaced population: During Year 1, the project has improved access to TB services for the Internally Displaced Persons (IDPs) population concentrated in Protection of Civilian (POC) sites and camps. Quality TB services are available for the IDPs in the Juba POC site in Central Equatoria and Mingkaman IDP camp in Lakes which hosts IDPs from Jonglei state. TB case notification has increased from 27 in October-December 2014 to 82 in July – September 2015. This increase has been attributed to good coordination with the health partners implementing general health care services in these sites. TB services have been integrated into the routine primary health care system in the camp. To achieve this, CTB has trained 42 (7 female, 35 male) clinicians and nurses on TB case management, 6 male laboratory technicians on smear microscopy and 54 (17 female, 37 male) community health workers on the identification and referral of presumptive TB cases and follow up of patients on treatment. Expansion to other POC sites is ongoing with partners willing to establish TB services being mapped. The International Office for Migration (IOM) has also been identified for Bentiu POC and will be supported in training health care workers and in the provision of IEC materials to support community based TB activities.

Increase case finding through contact tracing: As part of the quarterly review meeting, the community mobilizers in Yei, Morobo and Lainya Counties were equipped with knowledge and skills to screen contacts among the household members of the smear positive (SS+ve) index cases. Using the TB Management Unit Register as a resource, SS+ve patients were mapped and assigned to the community mobilizers. The activities started in July 2015. Over 890 smear positive cases were retrospectively mapped in the 3 locations since 2012. About 11.9% (107/892) smear positive index cases were followed up in which 853 household members were screened for TB using standardized tools. Out of 853 household members screened, 21.3% (182) were referred to a health facility for smear microscopy of whom 15.4% (28) were identified as smear positive TB cases (Table 2). This gives a prevalence of 3,282 per 100,000 population among the contacts compared to 256 per 100,000 population estimate from WHO. The yield of contact tracing is more than 12 times of the general population estimate. The contact investigation has been extended to Juba County but the outcomes will be measured in the subsequent quarter. Isoniazid Preventive Therapy (IPT) for under 5 years is not routinely reported and data is not available for analysis. This is going to be addressed in the Year 2 work plan.

Access to quality treatment and care: The CTB project has supported the expansion of TB treatment centers to Primary Health Care Centers (PHCC) and Primary Health Care Units (PHCU) in Central Equatoria State. This was the strategy for the Year 1 work plan which is in line with the National Strategic Plan (NSP) for TB in South Sudan for decentralizing TB treatment to the lowest level of health care and in the community. Patients are transferred from the heavy load facilities to continue treatment at the nearest health facility with the support of community mobilizers from those locations. TB treatment centers have been expanded from 10 in October 2014 to 22 in September 2015. The

strategy will be rolled out to other states in the Year 2 work plan. This will ensure adherence to TB treatment.

Ensured quality TB diagnostic services: CTB supported the expansion of quality diagnostic services to people with presumptive TB. Despite the security challenges, assessment has been conducted in 10 of 120 functional laboratories in Greater Equatorial State. All the assessed laboratories are in Central Equatoria State except one in Western Equatoria because of the relative security in this region. Key diagnostic gaps have been identified. The faulty microscopes with missing or damaged parts will be assessed and repaired. The project has procured 30 LED microscopes to replace CX21 in locations where the workload is high. Eight laboratories have been targeted for the LED to replace the CX21 microscopes in October. Eight laboratory technicians have been trained on LED microscopy including the use and maintenance of the LED microscopes. Cumulatively, External Quality Assurance (EQA) has been conducted in 32 laboratories (with a total coverage of 37% laboratories) out of 87 nationwide, which have shown favourable results of 83%. In order to decentralize and increase the EQA network, 10 laboratory technicians from 8 states were trained as TOT. They will support the expansion of EQA activities in their respective states.

Increase utilization of GeneXpert Testing: CTB supported the use of new technologies to move forward in the global fight against TB. Roll out of the GeneXpert started with only 2 GeneXpert machines at the CTRL since November 2014. The utilization has been low due to challenges of transporting samples from the peripheral laboratories to the CTRL. Through CTB, a network has been established and samples are being transported from the TB laboratories to CTRL. Use of local boda boda (motorcycle) riders has been instrumental in increasing the utilization of the GeneXpert in Juba County since July 2015. The health care workers were sensitized on GeneXpert algorithm and SOPs. This has resulted in an increase in GeneXpert tests by 1122% from 18 tests in June 2015 to 220 tests in September 2015. In total, 401 tests have been processed of which 379 had valid results. Three hundred and twelve tests were performed on new, smear negative cases out of which 109 (35%) were MTB positive and 3 (1%) were Rifampicin Resistant (RR). Among the 19 re-treatment cases, 3 (16%) were RR. Among the 16 Patients Living with HIV (PLHIV) tested, 5 (31%) were MTB positive and 1 (6%) was RR-TB. With support from the Global Fund, 5 GeneXpert machines will be procured and will be distributed to TB sites with high HIV prevalence. CTB will continue to support the transportation of the samples from peripheral to CTRL. Biosafety transportation containers (300) have been procured through CTB for this purpose.

2. Introduction

South Sudan is the youngest nation in the world, and relative peace was observed until December 15, 2013, when the country plunged into civil unrest following political divide. The country has one of the highest maternal mortality rates (2,054 deaths/100,000 live births) and under-five mortality rate (135 deaths/1,000 live births). More than 90% of the population lives on less than one USD a day. Currently, the country is experiencing a humanitarian crisis, with over 1.5 million people displaced, 200,000 refugees moving into neighbouring countries, and over 5 million people facing starvation. This has resulted in difficulties accessing basic health services. TB programs have collapsed in some areas, causing many TB patients to lose access to treatment. The WHO estimates the incidence of disease at 146 cases/100,000 people, and mortality at 30 deaths/100,000 people (Global Tuberculosis report 2013).

Challenge TB (CTB) is a five-year program funded by the United States Agency for International Development (USAID). The project is implemented by lead partner KNCV Tuberculosis Foundation (KNCV), and other consortium partners. Management Sciences for Health (MSH) is the lead implementing partner in South Sudan and the project will run from October 2014 – September 2019. For the Year 1 workplan, USAID obligated USD \$ 2,382,992. Overall, CTB aligns with the WHO post-2015 Global TB Strategy and the new USG TB Strategy to enhance its focus on improving patient-centered quality TB services, developing evidence based country specific strategies to achieve high impact results, building local capacity and the utilization of innovations and new technologies to move forward in the global fight against TB.

World Health Organization (WHO) estimates that the prevalence of MDR-TB among new TB cases and retreatment TB cases is 1.8% and 19% respectively. TB services are provided to patients in only 87 health facilities out of the existing 1,147 (7.6%) which account for 31% of the 284 PHCCs throughout the country. The HIV/AIDS epidemic is generalized in South Sudan. In 2012, the prevalence of HIV infection was estimated to be 2.6% among the persons aged 15 to 49 years and the prevalence of HIV infection in patients with TB is approximately 15%. Also, the cohort analysis of TB/HIV patients who are treated for TB within the existing NTP network indicates that the death rate was 11% in 2012. Only 16 (8%) of civil society organizations out of the available 200 have been engaged in TB activities. Successful experiences in pilot projects in Munuki PHCC and Gordim have shown that community mobilizers can significantly reduce the proportion of TB patients who defaulted on their treatment.

In South Sudan, CTB will implement high impact interventions in selected geographical locations in three states of Central Equatoria, Eastern Equatoria and Western Equatoria (Figure 1 – 5). The focus will be on: integrating TB care (including HIV care) in the general health care services, implementing community based care through CBOs using the existing structures, supporting the expansion of quality diagnosis, and supporting capacity building of the National Tuberculosis Program (NTP) at the central and state levels.

During its first year, the CTB-South Sudan project has focused its resources on impacting TB control under the following four sub-objectives of the global Challenge TB project: Enabling environment; Comprehensive, high quality diagnostic network; Patient-centered care and treatment; and political commitment and leadership. Currently, the project is implementing an accelerated implementation plan and hopes to achieve most of the targets in the Year 1 workplan.

Figure 1: Administrative unit of South Sudan by state

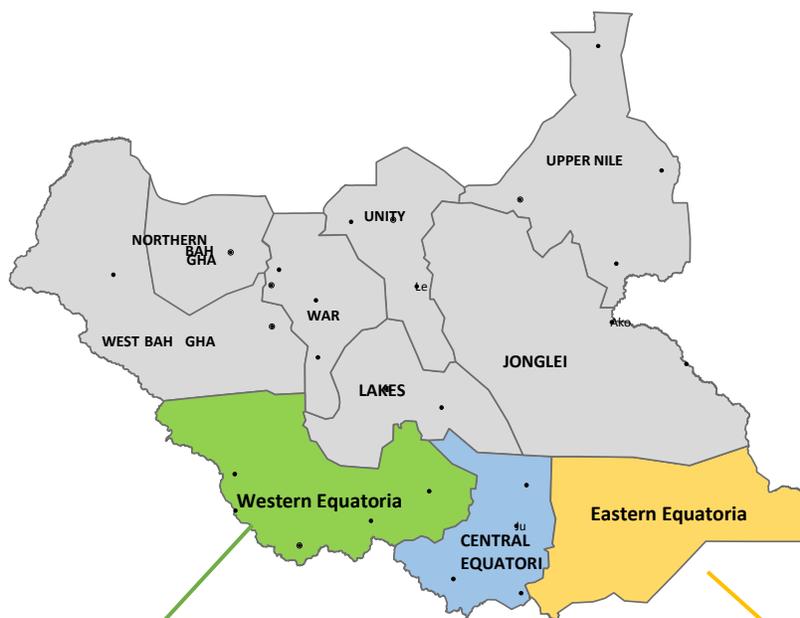


Figure 2: Western Equatoria State



Figure 3: Central Equatoria State

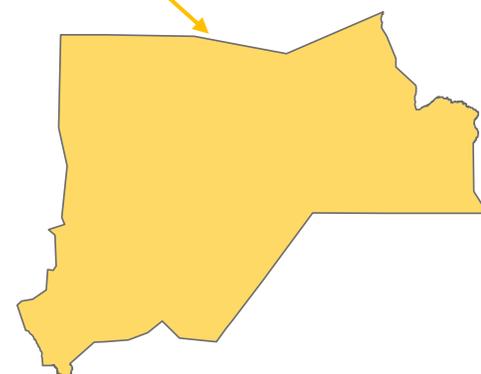


Figure 4: Eastern Equatoria State

¹Population: 665,559						Population: 930,233						Population: 380,344					
Category of health facility						Category of health facility						Category of health facility					
Hospitals		PHCCs		PHCU		Hospitals		PHCCs		PHCU		Hospitals		PHCCs		PHCU	
² All	³ TB	All	TB	All	TB	All	TB	All	TB	All	TB	All	TB	All	TB	All	TB
7	5	30	12	177	0	7	3	60	14	186	7	8	5	38	6	177	0

¹ Population estimated projected from 2008 census with annual population growth of 3%.

² All - Total health facilities in the state by category

³ TB - Health facilities with TB services

3. Country Achievements by Objective/Sub-Objective

Sub-objective 1. Enabling environment

This sub-objective focused on strengthening the policy environment for an effective national TB response at all levels of the health system through the provision of TB treatment for all forms of TB according to national guidelines and the scale-up of community TB care. The framework for TB prevention, care and control for refugees and internally displaced persons has been developed. This will form a framework that the partners will use to implement TB services in these settings. The community TB health worker's manual and job-aids have been developed to guide implementing partners and the community health workers in implementing TB activities at the community level. The materials have been reviewed by the MOH BCC TWG and design of the artwork is on-going before they are printed and distributed. The revision and printing of the training manual has been delayed since the activity is linked to the planned revision of the TB guidelines which is supported through the Global Fund.

Table 1: Achievement on outcome Indicators for sub objective 1 – Enabling environment

Number	Outcome Indicators	Baseline (Year/ timeframe)	Target	Results
			Year 1	Year 1
1.1.1.	Availability of the TB Strategy for the Emergency TB Response (0=not available; 1=draft available; 2=final)	1=draft	2=final	1= draft
1.1.2.	Availability of the HHP Manual (0=not available; 1=draft available; 2=final)	0=not available	2=final	1=drafts
1.1.3.	Availability of the revised TB training manual (0=revision not started; 1=revision started; 2=final)	0=revision not started	2=final	0=revision not started
1.2.1.	Number of current/ex-TB patient groups engaged at the community level and also linked with the NTP	1 CBO	2 CBOs. CBO is replacing current/ex-TB patient groups	4 CBOs (finalizing the process of giving the sub-grant)
1.2.2.	% of (population) with correct knowledge and positive attitudes towards people affected by TB	Baseline within first 3 months	increased % compared to baseline	Not conducted. Was tied to 1.2.1 above

Key Results

TB services accessible to internally displaced persons: Development of key national documents has been supported through CTB Year 1 Work plan. The drafts documents available include Framework for Tuberculosis prevention, care and control in refugees and internally displaced populations in South Sudan and the Home Health Promoter Manual. Using the training manual from NTP, CTB trained Health Care Workers from Mingkaman IDP camp and Protection of civilian (POC) site in Juba. A total of 42 (F: 7, M: 35) clinicians and nurses from the sites were trained on TB diagnosis and Case management. Additional 54 (M 17; F:37) Community Health Workers have been trained on basic

knowledge about TB, including TB screening, presumptive TB case identification and referral to the diagnostic centre, increasing awareness and messages about TB control in the IDP camp.



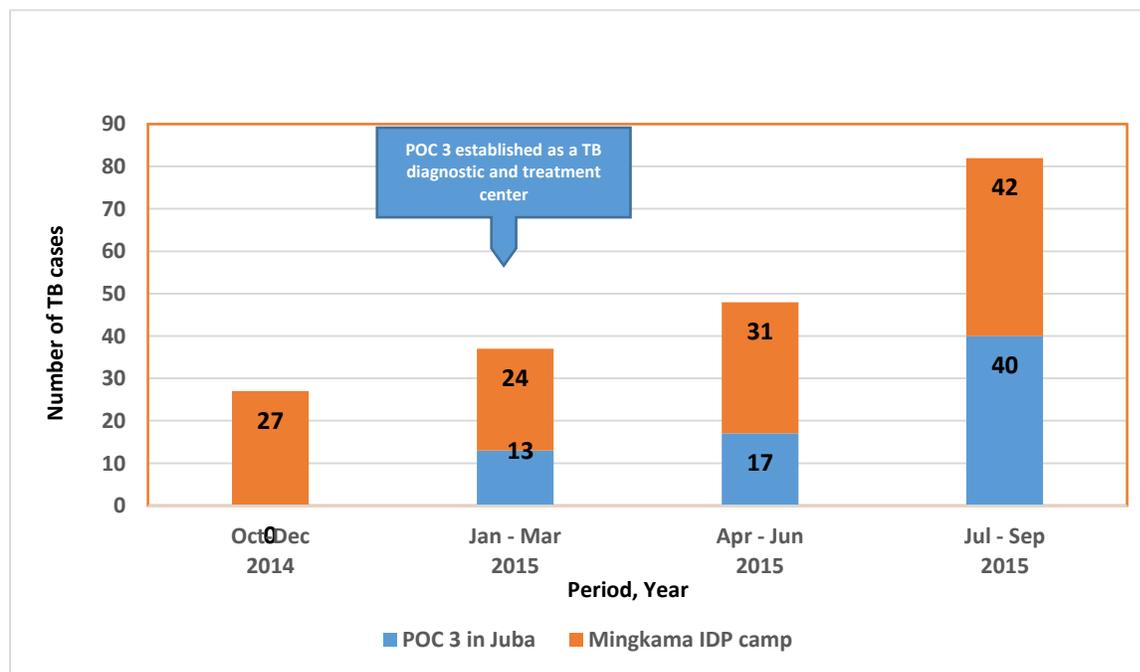
Photo 1: Participant discussing TB infection control (Mingkaman IDP camp)



Photo 2: Participants performing a role play on the use of WHO screening questionnaire to identify presumptive TB cases at OPD/triage, and IPD (Juba POC)

Cumulatively, 194 TB patients have been diagnosed and put on treatment (figure 5). This represents prevalence of 250 and 124 per 100,000 population⁴ in Juba POC site and Mingkaman respectively.

Figure 5: TB cases notified in the Internally Displaced Persons (IDP) sites



Challenges

- The process of reviewing the manual has been slow with the technical teams taking extended time to review. However, through CTB, we have been able to put the material in the agenda of

⁴ Population estimate 27,990 in POC site (IOM) and 100,000 in Mingkaman.

the BCC TWG and the final draft has been approved for printing after the artwork and design is finalized.

- The NTP through the Global Fund has identified a consultant to support in the review of the TB Guidelines which will inform the process of updating the TB training manual. The consultant is available in November 2015. This has caused a delay in the review of TB training manuals for health care workers in South Sudan. The support to review the training manual has been carried over to the CTB year 2 work plan.

Next Steps

- Follow up with the NTP to ensure that the TB guidelines have been revised which will then be followed by updating the TB training manual before endorsement and printing can be done. The process will begin during the review of the guidelines.
- Provide mentorship and follow up visits to Mingakama and Juba POC 3. Support supervision and follow-up of activities established and being implemented in the POC and IDP camps in Juba and Mingkaman respectively. This will continue in CTB year 2.



Photo 3: Group Photo for clinicians/ nurses in Mingkaman IDP camp

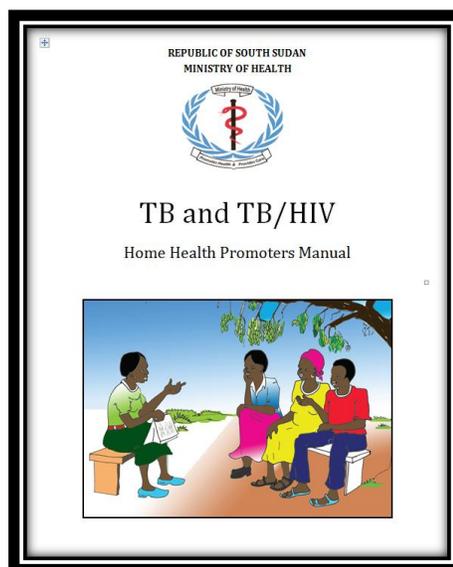


Photo 4: Draft TB and TB/HIV manual for Home Health Promoters

Sub-objective 2: Comprehensive, high quality diagnostics

The CTB project key intended result is to provide quality assured TB diagnostic services to all people with suspected TB. Only 38/120 (32%) of health facilities are providing diagnostic services in 3 targeted states (Central Equatoria State, Eastern Equatoria State and Western Equatoria State). In addition, the DR-TB diagnostic capacity in the country is just starting. DST and culture are non-existent while the roll out of the GeneXpert has just started with only 2 GeneXpert machines at the CRL. Assessment of health facilities for the integration of TB diagnosis using the assessment tool has been ongoing in the targeted states though the process has been affected by insecurity especially in Western Equatoria State and part of the Central Equatoria state. The assessment has been conducted in 14 health facilities in Central Equatoria out of which 12 meet the minimum requirements to integrate TB microscopy. Procurement of the microscope spare parts, LED microscopes and starter kits has been completed. Training on the LED has been conducted for 9 laboratory technicians from labs across the country. Distribution has been delayed by the logistics of transporting the LED to the identified locations due to insecurity on the road. Expansion of the EQA network continued during the year. Trainer of Trainers (TOT) was conducted in August 2015 for laboratory supervisors from across the country. The purpose was to decentralize EQA activities to state level. Resources will be provided to support the decentralization in the year 2 workplan.

Table 2: Achievement on outcome Indicators for sub objective 2 – comprehensive, high quality diagnostics

Number	Outcome Indicators	Baseline (Year/ timeframe)	Target	Results
			Year 1	Year 1
2.1.1	Number of laboratories performing microscopy (stratified by LED florescence, Ziehl-Neelsen)	WES: 13/37 ; CES: 15/49 and EES: 10/34 Three laboratories with LED FM	WES: 14/37 ; CES: 19/49 and EES: 11/34	WES: 13/37; CES: 15/49 and EES: 10/34 Not achieved. No new diagnostic center was established. Assessment done but due to security reasons 10 health facilities will be targeted in Year 2 of the project
2.2.1	Number of laboratories/% of laboratories enrolled in EQA for smear microscopy	29/87 (33%)	49/87 (56%)	32/87 (37%) laboratories in the EQA network country wide. Insecurity did not allow comprehensive coverage of all the laboratory in the network
2.2.2	Number/% of laboratories showing adequate performance in external quality assurance	29/87 (33%)	49/87 (56%)	19/32 (59%) Insecurity did not allow

	for smear microscopy			comprehensive coverage of all the laboratories in the network
2.4.2	Number of GeneXpert/% of GeneXpert machines that are functional in the country (stratified by Challenge TB, other)	2 in one state	5 in 3 states	2 (all in the CRL) The GF has delayed in procurement of 5 additional GeneXpert machines. Follow-up with the United Nations Development Program (UNDP) to speed up the procurement process
2.4.6	Number of new TB and Rif-resistant cases/% of new TB and Rif-resistant (RR) cases diagnosed using GeneXpert	0%	10% increase of new TB cases compared to baseline	New TB among new patients: 36% (112/312) RR among new cases: 1% (3/312) RR among re-treatment cases: 16% (3/19)
2.4.7	% of labs using WHO approved rapid diagnostic tools (disaggregated by type: Xpert MTB/RIF, LPA, etc.)	Baseline 1 out of 87 (1.1%) TB labs	5 out of 87 TB (5.7%) laboratories.	1 out of 87 (1.1%) laboratories. Tied to GeneXpert expansion plan
2.6.4	Number of specimens transported for TB diagnostic services	No baseline	150	401 See table 3 below

Reason for not meeting targets: Insecurity within South Sudan due to the war hampered most activities from being implemented, especially outside of Juba.

Key Results

1. Expanding TB laboratory services

Achievement

- Expansion plan in the use of LED microscopy in South Sudan has been established. Procurement of 30 LED microscopes and 30 LED microscopy starter kits has been complete. Training of laboratory staff on the use of LED microscope has commenced with the first group of 9 having been trained. Distribution process is on-going for the lab with trained staff. The process will continue in the year 2 work plan.

- Assessment of 10 peripheral laboratories has been conducted in Central Equatoria State. Seven have been target for immediate integration of TB diagnosis services. Mentorship and on-job training will be conducted in quarter 1 Year 2 work plan.

Challenge

- Insecurity spread to previously safe counties in Central, Eastern and Western Equatoria states made it impossible to carry out assessment, but with anticipated calm and peace in these counties, the assessment will be possible. We expect the assessment to be completed during the months of October and November 2015
- The process of selection of the laboratories where LED microscopes will be established has been slowed since the geographical location has been expanded. The NTP suggest that the distribution target all functional TB laboratories with a heavy workload in South Sudan. This has affected the original LED expansion plan which had targeted the states of Central Equatoria, Eastern Equatoria and Western Equatoria for replacement of the CX 21 microscopes.
- Due to the poor road network and insecurity, delivery of the LED microscopes to the labs with trained staff has been delayed.

Next steps:

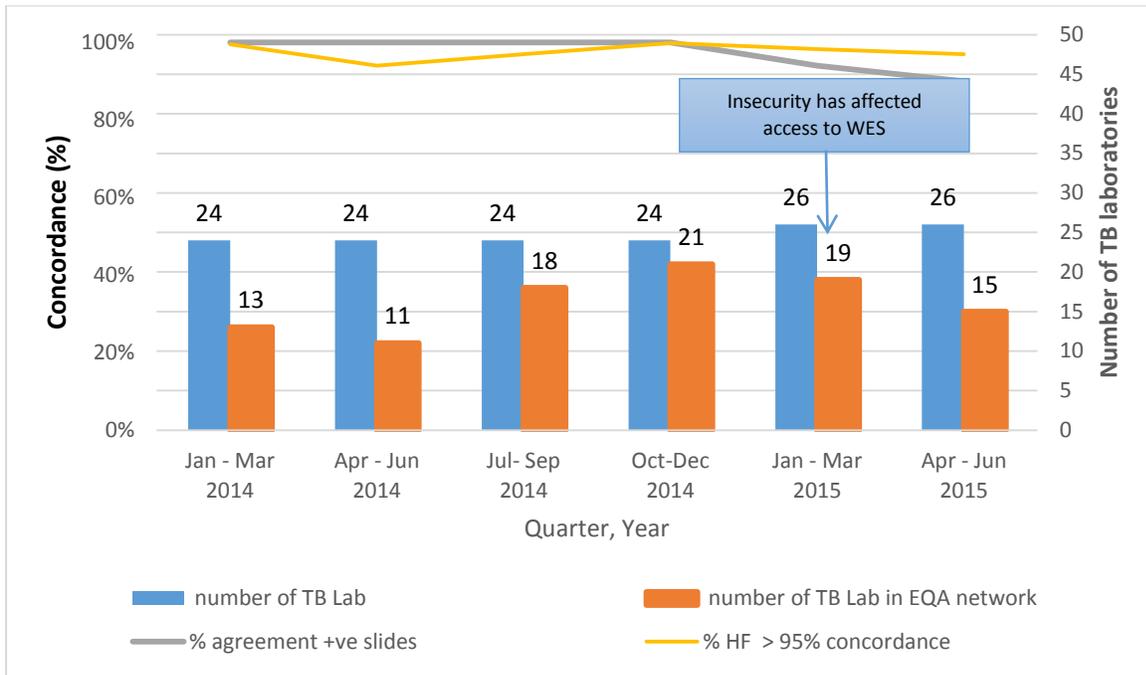
- Continue assessing additional health facilities in Western and Eastern Equatoria states.
- Plan training and mentorship program for the laboratories which have been targeted for TB microscopy.
- Revise together with the NTP the list of health facilities to upgrade the microscopy to LED microscopy technology.
- Schedule trainings for 22 lab technicians from the remaining TB laboratories. The other two trainings have been planned for the first quarter of Year 2.

2. Increase coverage of External Quality Assurance in targeted state

Achievement

- A total of 35 laboratories have been enrolled in the EQA network in South Sudan. There is an increase in the TB laboratories that have 100% true positives i.e. 86% period Jan – Dec 2014 compared to 75% in the period January-December 2013. This is as a result of targeted EQA visits to poorly performing laboratories. In total, 53 laboratory technicians have been mentored and trained on-the-job during the EQA visits
- TOT Training workshop was conducted 10 lab technicians (1 female and 9 males) working in TB labs at state level. The technicians have been equipped with the knowledge and technique to support decentralization of EQA activities. An action plan has been developed for each of the trained staff. Follow-up will be conducted in Year 2 work plan.

Figure 6: Combined EQA performance for the labs in Central Equatoria, Western and Eastern Equatoria States.



Challenges

- Aside from TB laboratories within Juba, EQA supervisory visits and mentorships for facilities out of Juba has been a challenge due to the deteriorating security situation in Central, Western and Eastern Equatoria States.
- Due to insecurity, the TB activities and by extension EQA activities have collapsed in 3 out of 10 states (Jonglei, Upper Nile and Unity). There were no participants from these states.

Next Steps

- Decentralize EQA activities to at least one laboratory for each of the Central, Eastern and Western Equatoria states. Work with the Staff at the Central Reference laboratory to support EQA activities across the country.
- Improve on laboratory networking and transportation of sampled slides from peripheral laboratories to the EQA central point in Year 2 work plan.
- Establish and build the capacity of the county TB focal person to integrate EQA activities in the routine supervision of TB activities. This will be done through the leveraging of resources from the GF



Photo 5: Group photo of TOTs

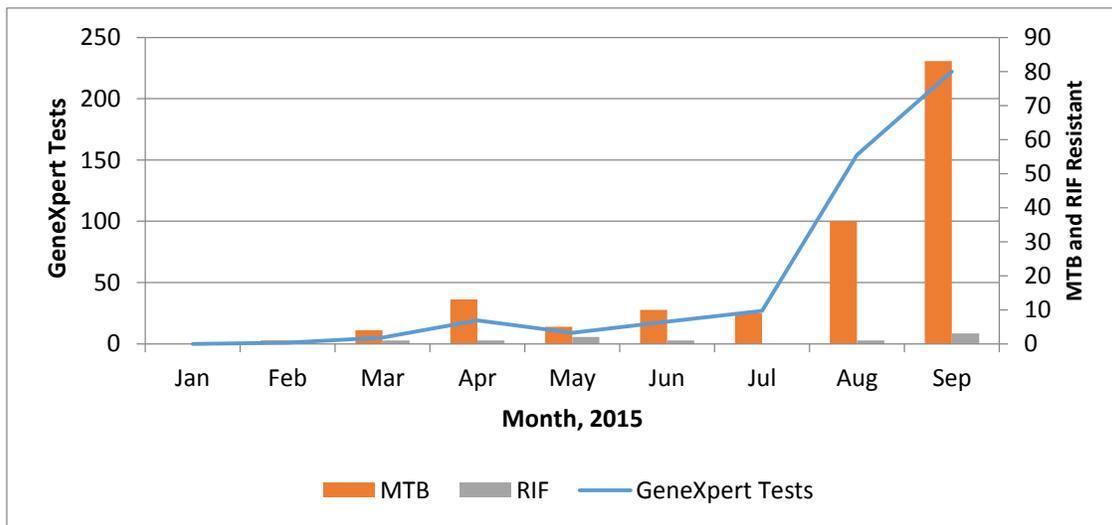


Photo 6: TOTs on practical session

3. Improved on the GeneXpert Utilization in South Sudan Achievement

1. Surveillance for MDR-TB among TB cases has increased since the introduction of GeneXpert testing at the CRL. The algorithm for Xpert Testing was developed with support of the Supranational Reference Laboratory Network (SRL) in Uganda. Transportation of samples has been accelerated since July 2015. One boda boda (Motorcycle) riders have been contracted to transport the samples from three (TBMUs) sites within Juba City. The rider visits each of the three locations daily (Monday – Friday), delivers the results for the previous day samples and collects the samples for GenXpert testing. Use of boda boda riders has seen an increase in samples transported from less than 20 per month to over 250 per month.

Figure 7: Number of RIF-resistant cases diagnosed using GeneXpert among the retreatment cases January–September 2015



2. Over 401 samples have been transported for GeneXpert testing from January-September 2015 out of which 379 (95%) successful tested were reported. Overall, 2% (7/379) samples are RIF resistant. Samples have been collected from these patients and referred to the Central

Reference Laboratory (CRL) Nairobi for Culture and DST. About 38% (144) samples have been put on treatment (table 3 below). Feedback results are provided within 24 hours from the time the samples are received for GeneXpert testing and are delivered by boda boda the following day to the respective TBMs.

Table 3: GeneXpert Utilization from January - September 2015

	New cases		Retreatment		ART site		Others (FU)		Total	
	Number	%	Number	%	Number	%	Number	%	Number	%
GeneXpert tests	331	100%	20	100%	17	100	33	100	401	100%
Invalid/Errors/No results	18	5%	1	5%	1	6%	0	0%	20	5%
Valid tests	312	94%	19	95%	16	94%	32	97%	379	95%
MTB Detected	112	36%	14	74%	5	25%	13	41%	144	38%
MTB Detected - RIF Resistance	3	1%	3	16%	1	6%	0	0%	7	2%
MTB Not detected	200	64%	5	26%	11	69%	19	59%	235	62%



Photo 7: Delivery of Sputum samples by the boda boda rider to CTRL staff

3. A sensitization workshop was conducted for 24 health care workers (14 clinicians and 10 lab personnel) in June 2015. The workshop focused on the use of GeneXpert algorithm and SOP, improving diagnostic capacity of DR-TB among new and retreatment TB cases as well as PLHIV receiving ART at Juba Teaching Hospital.



Photo 8: Group photo of clinicians and lab technicians during the workshop on GeneXpert utilization



Photo 9: Demonstration of GeneXpert use at the TB Reference lab

Challenge

- There is no programmatic management of MDR-TB in South Sudan. There is a significant backlog of patients who are waiting for treatment. The Global Drug Facility (GDF) mission and Green Light Committee (GLC) have recommended that the country start MDR-TB treatment, however there are no second line drugs (SLDs) in country. SLD are being procured through Global Funds to treat 15 cases by the end of 2017. Meanwhile WHO is working with AFRO to finalize the draft PMDT guidelines.
- The patients come from across South Sudan and the mapping of cases since has been difficult because of the highly dynamic and movement of the population following the December 2013 political crisis. However, patient follow-up is conducted through the nearest health facilities and health education is provided to the patients and the family members.

Sub- objective 3: Strengthening patient-centered care and treatment

Involvement of communities in TB prevention, care and control has not been widely scaled up. Based on a gap analysis, the case notification and treatment adherence is low due to the low coverage of TB services and poor integration of TB services. During year 1, the CTB project has contributed to improving case finding through intensified TB case finding at the health facility and community levels among high risk and hard to reach populations. The CTB project intends to increase coverage and improve integrated TB prevention, care and control of TB at the community level. The delay in the recruitment of the CBOs has delayed the expansion of community based activities in the 3 targeted states.

Table 4: Achievement on outcome indicators for sub-objective 3 – Strengthening patient-centered care and treatment

Number	Outcome Indicators	Baseline (Year/ timeframe)	Target	Results
			Year 1	Year 1
3.1.13	Number/% of presumptive TB patients referred by community referral systems	Baseline within first 3 months	5% increase compared to baseline	Not measured. The data was not complete in the lab register to allow the measure for the indicator.
3.2.3.	Number/% of health facilities with TB services/DOTS	8% (37/462)	10.6% (46/462) in the 3 states	9.5% (44) in the 3 states
3.2.20	Number/% of health facilities providing CB-DOTS services	8% (37/462)	10.6% (46/462) in the 3 states	9.5% (44) in the 3 states

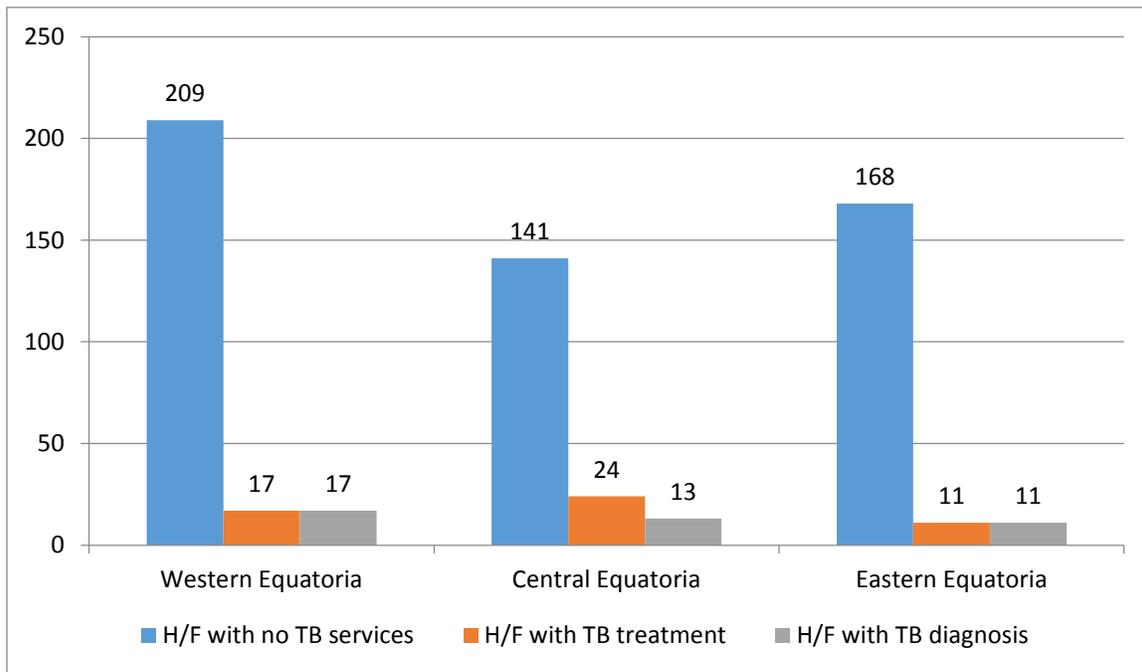
Key Results

Achievements:

1. Improve access to TB treatment in Central Equatoria State

Since August 2015, CTB has supported the establishment of 11 TB treatment centres (figure 8). Mapping was done for TB patients using the TBMU register and 51 TB patients were transferred to continue with their treatment in these established TB treatment centers. In order to accomplish this, 22 HCWs (7 females and 15 males) from the selected TB treatment centers received on-the-job training by the CTB team on how to dispense anti-TB drugs, how to record patient data on a TB treatment card and how to promote adherence to TB medication. The treatment centers will work closely with community mobilizers to refer presumptive cases for TB diagnosis to the nearest diagnostic center.

Figure 8: : Health facility TB services coverage in Central, Eastern and Western Equatoria States



2. **Intensified case finding among PLHIV:** PLHIV at Juba teaching hospital are being screened for TB through GeneXpert testing. CTB is supporting the transportation of sputum samples to Central Reference Laboratory (CRL) for GeneXpert testing beginning in August 2015. One site (JTH) has been included for the active case finding (ACF) of TB among the PLHIV through the use of GeneXpert testing. Fifteen PLHIV have been screened for TB. Five are MTB positive (33%). Among those who are positive, one is also RIF resistant (20%).

3. **Contact investigation in Yei, Morobo and Lainya:** Contact investigation was initiated in July 2015 in Lainya, Yei River and Morobo Counties in Central Equatoria State. A total of 890 smear positive index cases were identified from the units using the TBMU and mapped based on residence. Forty-eight community mobilizers were trained on how to screen and refer contacts for diagnosis using standard tools and forms. The findings are shown in the table below. Over 23% (182/853) of contacts screened were referred for TB microscopy out of which 15.4% (28/182) were smear positive (Table 5). Isoniazid Preventive Therapy (IPT) for under 5 years is not routinely reported and data is not available for analysis. This is going to be addressed in the Year 2 work plan. The screening of household contacts have identified 15% smear positive TB cases compared to 8% (19/237) smear positive identified in 2014 through creating awareness about TB in the community.

Table 5: Summary data on contact investigation in Yei, Morobo and Lainya Counties, July – September 2015

S/N	VARIABLE	July - September 2015
1	Number of HFs implementing contact tracing	3 (Yei, Lainya and Morobo)
2	Number of Index SS positive cases mapped	892
3	Number of index cases traced	107
4	HH contacts registered	853
5	Close contacts <5 children	69
6	Number of household contacts screened for TB.	107
7	Percent screened among household contacts (%)	12% (107/853)
8	Proportion of presumptive TB identified (%)	23% (182/853)
9	Proportion of presumptive TB identified among under-5 children (%)	6% (11/182)
10	IPT coverage for under-5 children (among eligible) (%)	0%
11	Number of SM + TB cases identified among the contacts.	28
12	Percent yield among contacts screened for all ages	15.4% (28/182)

4. In total, 245 health education sessions have been conducted and attended by 16,354 (9,450 females and 6,904 males) out of which 231 (116 females and 115 males) have been referred for further evaluation at the nearest TB microscopy center. The data on those identified with TB through this process could not be determined from the TB laboratory registers due to incomplete data at the laboratory. The data is presented during the quarterly review meetings. During the meeting, the participants are refreshed on the basic facts about TB, the roles of TB community mobilizers in TB case notification and control at the community level, their role in identifying symptoms of TB during TB screening in the community, the referral system from the community to the health facility and the challenges at each referral level and roll out of contact exercises in Lainya, Yei and Morobo counties.

Challenges:

- There was a delay in procurement of the GeneXpert machine under the GF which resulted in few ART centers being included in the screening with GeneXpert Machine. There was weak collaboration between the ART site and the TB laboratory in JTH.
- The points highlighted above reflect just over two months of activities. The delay has been due to the prolonged recruitment process of the technical staff. Insecurity and ongoing conflict has limited the extent to which the project can reach the health centers in the targeted states.

Next Steps:

- Continue using the available GeneXpert in Juba Teaching Hospital ART clinic and expand to 2 ART Clinics in Central and Eastern Equatoria States. Communicate with ART and TBMU staff to improve on information sharing and better identify gaps in the future
- Continue monitoring the uptake of TB treatment in the established TB centres in Lainya, Yei and Morobo counties. Expand TB treatment in 4 additional health facilities in Juba County by the end of 2015. Complete the Monitoring of Contact Investigation exercise and analyze the results

Sub-objective 7: Political commitment and leadership

The National Strategic Plan (NSP) is completed and has been costed. CTB is supporting the implementation of the NSP's key strategic interventions. The intended result is to operationalize the NSP by developing an annual operational plan. The review has been challenging due to the delay in endorsement of the NSP. CTB intended to support the NTP staff to participate in an international course in Arusha, Tanzania. However, this course was not offered in 2015. A planned peer-to-peer exchange program was interrupted by insecurity in the country. CTB, jointly with NTP will present an oral presentation session in the 46th Union Conference. CTB will support one NTP staff to participate in the conference. World TB day was commemorated on March 24, 2015 with activities planned across all levels of TB care.

Table 6: Achievements on outcome indicators for sub-objective 7 – Political commitment and leadership

Num ber	Outcome Indicators	Baseline (Year/ timeframe)	Target	Results
			Year 1	Year 1
7.1.2	Status of NSP development: 0=The NSP is expired or not being implemented; 1=An updated/new NSP is being drafted; 2=NSP has been developed and costed; 3=NSP has been finalized, endorsed by the government and implemented	2	3 (Phased implementation plan finalized and endorsed)	2 (Finalized but not endorsed by the MOH)
7.2.1	% of NTP budget financed by domestic resources	8%	8%	0
7.3.2	Number of NTP members participating in a Challenge TB-led leadership program	0	2	0
7.3.3	% of the staff who attain annual performance evaluation score (at least 50% score per individual)	80% (National NTP staff)	90% (National NTP staff)	Not measured performance evaluation for NTP staff is conducted at the end of the calendar year.

Key Results

Achievement

- One oral presentation abstract has been accepted for the UNION Conference in Cape Town, South Africa. Title of the abstract "Improving Treatment Success Rate by use of community mobilizers in Juba South Sudan".
- Commemoration of the World TB Day. Awareness campaigns were carried out through Live radio talk shows, distribution of IEC materials, community awareness campaigns in schools, market places and churches as well as road drive shows in Yei Town and the surrounding environment, Commemoration of World TB Central was conducted in Yei town, Yei River County in Central Equatoria state and in Rumbek town in Lakes state.

Challenge

- The endorsement of the National Strategic Plan by the Ministry of Health has not been completed. This has led to the delay in scheduling time for the consultant to come and support the process of developing the implementation plan for the NSP. This activity has been carried over to year 2.

Next Steps

- Follow up with the NTP on the update for endorsing TB strategic plan.



Photo 10: Football match to commemorate the World TB Day 2015 in Yei County

5. Challenge TB Support to Global Fund Implementation

Current Global Fund TB Grants

Table 7: Current Global Fund TB Grants

Name of grant & principal recipient (i.e., Tuberculosis NFM - MoH)	Average Rating*	Current Rating	Total Approved Amount	Total Disbursed to Date	Total expensed (if available)
TB NFM SSD-T- UNDP 1 July 2015 – 31 Dec 2017	n/a	n/a	\$15.5M	\$5 M	
TB/HIV TFM SSD-708-G11-T – UNDP 1 Jan 2014 – 30 June 2015	B1	B1	\$ 18.7M	\$ 18.7M	
TB Round 5 SSD-506-G06-T - UNDP 1 Oct 2006 – March 2012	A2	A1	\$ 22.9M	\$ 22.9M	
SSD-202-G02-T-00 -UNDP 7 1 Oct 2004 – 30 Sept 2009	n/a	n/a	\$ 14.0M	\$ 14.0M	
Total	A2		\$ 71.1 M	\$ 55.7M	

* Since January 2010

In-country Global Fund status - key updates, current conditions, challenges and bottlenecks

The New Funding Model (NFM) covers the period 2015 – 2017. The goal and objectives of the NFM are in line with NSP and are as follows:

Goal: To contribute to achieving the goal set by the national policy to control TB and emphasized in the 2015-2019 NSP: To reduce the TB prevalence by 30% (based on the WHO estimates) by 2030

Objectives:

1. To increase the detection of patients with all forms of TB by notifying 12,650 TB cases in 2015, 13,840 by 2016 and 15,150 by 2017 and to increase the TB treatment success rate from 72% in 2012 to 85% in 2017.
2. To reduce the death rate from 11% in 2012 to 5% by 2017 in HIV-co-infected TB patients who received TB treatment.
3. To enroll 5 MDR-TB patients on second line TB drug treatment in 2015, 10 in 2016 and 15 in 2017 and to successfully treat 70% of these cases
4. To improve and reinforce the technical and managerial capacities of the NTP

Key update

The Global Fund grant was signed by the Principal Recipient (UNDP) with the first disbursement issued. A new NFM grant recently signed to cover the period from July 1, 2015 to December 31, 2017. The actual disbursement in 2014 was \$3.8M. The budget for 2015 is \$2.8M and the forecast is \$5.8M. New sub-recipients (SR) are being recruited in accordance to the DOTS expansion plan. The Country Coordination Mechanism (CCM) for GF has gone through major restructuring in order to improve its performance and eligibility.

Table 8: Global Fund disbursement plan for TB grant in South Sudan

SOUTH SUDAN : TB \$m	2014 ACTUAL	2015 BUDGET	2015 FORECAST	2016 FORECAST	2017 FORECAST
Disbursements	3,802,429	2,880,799	5,884,900	5,044,150	5,044,441
GRANT STATUS	New NFM grant recently signed to cover period from 1 July 2015 to 31 December 2017				
KEY RISKS / AREAS FOR CAPACITY STRENGTHENING	<ul style="list-style-type: none"> • TB services are not available in all parts of the country and the overall capacity of health system remains weak (poor health infrastructure, inadequate HRH, inadequate PSM system, etc). Partner support in implementation is critical to enable activities and hence absorption. • Delays in SR nomination & capacity assessments highlight weaknesses in overall implementation capacity. HSS capacity needs to be aligned with other partner work. 				

Challenges and bottlenecks

Challenges and bottlenecks include the current political environment, which may hinder the DOTS expansion plan as indicated in the New Funding Model. The implementation of activities may be hampered in some states (Jonglie, Unit and Upper Nile) due to the ongoing crisis, which limits accessibility. The structure for managing GF resources at the state level is lacking. Funds meant for state level activities are managed centrally, which results in delayed implementation of activities.

TB services are not available in all parts of the country and the overall capacity of the health system remains weak (poor health infrastructure, inadequate HRH, inadequate PSM system, etc). Partner support in implementation is critical to enable activities and facilitate absorption. Delays in SR nomination and capacity assessments highlight weaknesses in overall implementation capacity. The HSS capacity needs to be aligned with other partner work.

Challenge TB involvement in GF support/implementation, any actions taken during Year 1

CTB has been involved in the grant negotiation process, the review and development of targets for the sub-recipients (SRs) and the review of technical proposals for the new SRs to be recruited.

In collaboration with the NTP, support activities at the CTRL and trained laboratory staff from 8 of the 10 states in South Sudan as TOT who will support the roll-out of EQA activities to the regions. An expansion plan for the LED microscope has involved TB laboratories from other regions. CTB has worked in collaboration with the PR and SR in data collection and analysis. CTB participated in the quarterly review meeting for the TB and HIV program from the states that was held at national level.

6. Challenge TB Success Story

Stories from Field

1. Providing access to TB treatment at Community Level:

"Thank God, Thank God, Thank God" were the words of 75-year old Bereta Nyoka when she heard she would be able to receive her TB medication from a health center only 3 km from her home. She had already faced a long struggle with the disease, since she started coughing and having chest pains in March 2015.

"I was examined in two different private clinics, but, there was no improvement. In fact one of the clinics was treating me for typhoid," Bereta explains. "Then I was advised to go to Yei hospital."

At the hospital Bereta was correctly diagnosed with TB and started on treatment. After spending time in the hospital, she was sent home with instructions to return to the hospital to pick up more medication when she completed the supply she was given.



Photo 11: Bereta telling her difficulties in accessing TB drugs. Photo 12: Bereta Nyoka Thanking the team.

"I'm taking my drugs without missing any single dose, but because of the distance and expenses on *boda boda*, I missed my appointment," Bereta explained. "Going to Yei was very difficult for me. I have no money for going to Yei and my son who used to help me is now in Juba and I have no contact with him. I'm very old and too weak to move on the road with all these potholes."

Medication adherence enables the patient to potentially be cured, reduces mortality related to TB, stops the spread of TB to others and stops the development and the spread the drug-resistant TB. Limited access to TB treatment centers was a major cause of TB treatment interruption (missing dosages) and a significant barrier to successful completion of a TB regimen. Challenge TB, a USAID-funded project, did a mapping of TB patients and the nearest health facilities. They mentored the facility staff responsible for TB treatment onsite and expanded access to TB treatment in 4 primary health care centers and 4 primary health care units in Yei River and Morobo Counties with referral links to the Yei and Morobo County Hospitals.

With the ultimate goal of linking the patients to the health center or unit, Challenge TB also supports the state TB control program and county hospital TB unit to deliver TB drugs to the local health facility.. TB patients on active treatment were tracked from the TB management unit registers in Yei, Lainya and Morobo Hospitals with the help of TB community mobilizers and the TB hospital nurses to find their complete addresses, locations, categories of treatment and the next date the patients would need drug refills.

Bereta Nyoka was among the many TB patients mapped by the Challenge TB team and the TB community mobilizers. Through the help of a TB hospital nurse, the Challenge TB team packed TB drugs and delivered them to Pisak Primary Health Care Unit (PHCU), a health facility close to Bereta's home. Seventeen TB patients are now accessing TB treatment from their nearest health facilities through the Challenge TB intervention.

Bereta assures the team that she would go to Pisack PHCU to pick up her next refill as soon as she needed it.

"I'm grateful to God that he has brought you here with my drugs," Bereta says.

2. Expansion of TB treatment using the Primary Health Care Units: Stories as told by TB patients upon refill of their TB drugs



Photo 13: Home of Gabriel Malish



Photo 14: Gabriel being told that he could now access TB drugs from Pisack PHCU



Photo 15: Gabriel was happy after receiving being given the TB drugs.

Gabriel Malish lives with his wife about 300 meters away from the Piscack PHCU. It was at that facility that a health worker first suspected Gabriel had TB.

"I started feeling unwell around November of 2014; I developed [a] very bad cough and chest pain," Gabriel explained. "I used to smoke heavily as well as drink a lot of alcohol. When my health continued to deteriorate, I had to come to Pisack PHCU. The health worker said he suspected I was having tuberculosis, therefore, I should go to Yei County Hospital for [a] checkup."

The 51-year-old took the health worker's advice and went to the hospital where he was diagnosed with TB and admitted in March 2015. Eventually, the coughing stopped and his health started improving, and he was allowed to return home. However, to prevent continued illness and to protect his family from the disease, it was important for Gabriel to continue his treatment and to take his medication as prescribed.

Poor adherence to TB treatment can lead to development of multi-drug resistance TB, increased risks of relapses, drug failure and development of MDR-TB, increased cost of treatment, increased spread of TB in the community and poor quality of life leading to deaths. The follow-up visit by the TB community mobilizer to the TB patient improves the patient's level of knowledge about TB, promotes adherence and reduces stigma expressed towards the patient, his/her family and community members with TB.

Adequate health education and counselling is necessary to promote adherence. Through the Challenge TB project, health care providers are trained (through on-the-job training and mentorship) to be able to provide adequate health education and counselling on adherence. Challenge TB also trained

community mobilizers to be able to follow-up with TB patients and thus promoted adherence by ensuring community DOTS is implemented by the treatment supporter or the community mobilizers.

Gabriel was visited by community health worker, Malesh Edward, who encouraged him to revisit the Pisack health center for follow up. While there, Gabriel shared the challenges he faced getting his medication from the hospital, which was 14 miles away from his home.

"My worst moment again started when my one month drug [supply] was finished. I missed 4 days without my drugs while begging for money for a *boda boda* to Yei to refill my drugs," Gabriel explained. Although his medications are free, the month earlier Gabriel had paid 100 South Sudanese pounds to travel to and from the hospital to collect them and had no money left to go again.

While at Pisack PHCU Malesh told him that he will be collecting his TB drugs from Pisack PHCU instead of traveling all the way to Yei.

"*Alhambillai* (thanks be to God)," Gabriel said. "Now that I can pick my drugs from Pisack PHCU which is walking distance away from my home, I really don't know how to thank you. Now I will not be spending money on *boda boda*; instead I will be using that money to buy soup to help me regain my energy and weight."

The community mobilizer screened Gabriel's wife and she was found to have no TB symptoms. This was probably due to Gabriel's efforts to adhere to the TB treatment.

3. Filling the Gap in TB Knowledge: A Story told by a TB patient in South Sudan

In South Sudan, TB community mobilizers (TBCMs) provide a vital link between community members and TB diagnostics and treatment centers; they disseminate information about TB prevention and control. Challenge TB, a United States Agency for International Development (USAID)-funded project, supported the National TB program (NTP) to develop TB brochures. The project also trained 72 Community Mobilizers on basic knowledge about TB to increase their level of knowledge in order to provide information to the community during awareness sessions. Community Mobilizers carry out targeted community awareness activities about TB in schools, markets and during defaulter tracing of TB patients.

Morris Luete is a teacher and a TB defaulter at Minyori primary school in Minyori Boma, where he teaches students at levels 6 and 8. The 36 year-old is married with 5 children, and was diagnosed with TB at Yei Civil Hospital in January 2015. However, after four months of treatment, he discontinued treatment. Morris was visited by a team of community health mobilizers and shared his story with them.

"I have missed [treatment] for 4 months because of lack of money for my transport to go to Yei, because as a teacher, I receive little salary which is not adequate," Luete shares. "I still have the TB in my body because I still cough and when I cough, my chest hurts a lot."

The team advised him to return to the hospital for an examination so he could be restarted on treatment, and told him that his medication would be made available at the local clinic so he wouldn't have to spend money on transportation in the future.

During his conversation, the team also asked if Luete does anything to help prevent TB at the school where he works. But Luete expressed that his efforts were limited since he had "no clear information about TB prevention, transmission and control." The team told Luete that he probably has transmitted the TB germ to his pupils and the community TB mobilizers around that area therefore needed to screen the children.



Photo 16: TB Nurse giving Luete health education about TB control.

The Challenge TB team spent time educating Luete on TB transmission, prevention, and control as well as the benefits of adherence to TB treatment. The community mobilizer also promised to conduct a health education program and organize a TB screening in Luete's school.

7. Operations Research

Table 9: Operational Research undertaken in South Sudan

Title of OR study	Implementation Status	Key findings	Dissemination
Contact investigation among smear positive TB patients who were successfully treated (2-3 years back) at Yei, Morobo and Lainya County	The OR started in July and is ongoing	Preliminary finding: Mapping of 892 smear positive cases was conducted in July 2015. These were former TB patients who were registered in the TBMU registers 2-3 years ago. The geographical area includes Morobo, Yei and Lainya Counties in Central Equatoria State. Among the 892 former TB patients, only 107 (12%) were traced and contacts screened for TB. In the households of the traced index cases, 853 contacts were screened for TB. Among them, 182 (23%) were referred for diagnosis. Smear positive cases identified among the presumptive cases were 28 (15.4%).	The study is ongoing and will continue in the Year 2 workplan.
Surveillance for MDR-TB among new and re-treatment TB cases, and PLHIV by using GeneXpert testing in South Sudan	On-going	Over 401 samples have been transported from 3 peripheral TB laboratories and ART centers with in Juba City for GeneXpert testing from January - September 2015 out of which 20 have invalid results. The tests performed on new cases were 312 out of which 36% (112) were Mycobacteria TB detected and 3 (1%) were Rifampicin Resistant (RR). Among the re-treatment cases, 16% (3/19) were RR. Among the Patients Living with HIV (PLHIV), 31% (5/16) had Mycobacteria TB detected and 1 RR.	The study is ongoing and will continue in the Year 2 workplan.

8. Key Challenges during Implementation and Actions to Overcome Them

An accelerated implementation plan was developed after the approval of the year 1 workplan in May 2015. This included the hiring of new CTB technical staff. The hiring of the technical staff has been delayed due to difficulties in identifying qualified candidates for some positions especially for the key technical positions which include Deputy Project Director, and the Monitoring and Evaluation specialist.

The ongoing political crisis has resulted in an increase in the insecurity which has affected the relatively stable states of Central and Western Equatoria States. There is increased insecurity on the roads which is restricting movement to the states. This has affected implementation of the activities as per the accelerated work plan.

The local currency has depreciated against the dollar. The dollar is more than 3 times the local currency relative to the time the CTB year 1 budget was developed. This means the cost of commodities and supplies has increased and the local staff are buying less for a dollar. In order to get value for our money, a waiver will be prepared to allow for the paying of goods and services in dollars.

9. Lessons Learned/ Next Steps

- Joint planning and collaboration is the key to effective implementation of TB activities. Leveraging of resources among various donors enable the program to achieve more in terms of coverage and the quality of interventions. However, where activities are tied to each other may cause a delay in completing a task if the resources from one donor are not released in time. This has been the case during situations when documents needed to be printed and disseminated. An example is in the revision of the training manual which was to be supported through CTB and was tied to revision of the TB guidelines supported through the Global Fund. The review of the TB guideline has not been conducted. This has caused a delay in the review of TB training manuals for health care workers. The workshops to support the revision of the training manual have been carried over to the CTB Year 2 work plan. This includes the costs for printing and holding a dissemination workshop.
- CTB, in collaboration with the NTP and BCC technical working group of the Ministry of Health has developed the job aids to be used by the Home Health Promoters at community level. The job aids include flip charts, a handbook and brochure. They are in the final stage of approval before printing is done. The process of reviewing the manual has been slow with the technical teams taking much time to review. However, through CTB, we have been able to put the material in the agenda of the BCC TWG and the final draft has been approved for printing after the artwork and design is finalized.
- Provision of TB services among the refugees and displaced population is possible in the emergency settings. By working closely with the partners implementing health services for the

displaced populations it is possible to integrate TB services in the camps. Strong collaboration among the partners working in the IDPs is key towards achieving the goals. We are challenged by the fact that partners lack long term commitment which makes it difficult to established TB services even when the camps have stabilized. They also lack clear exit strategies. The training of health care workers and equipping the laboratories with TB diagnostic equipment can help in setting up TB services in these settings. Year 2 of the project will support the expansion of TB services to additional IDP and POC sites in South Sudan.

- Access to quality diagnosis is key for ensuring the identification of TB cases in the community. The assessment of health facilities using a simplified tool can determine and prioritize where TB microscopy can be established. Involvement of the health facility management and technical staff is key for uptake of these services. Human resources and poor structural infrastructure remains a challenge. With proper approaches, the health facilities that meet minimum requirements are willing to establish TB microscopy. An on-hand training and mentorship program for the laboratories staff has been shown to be more effective than classroom training. This strategy will continue in the Year 2 workplan.
- Introduction of a new TB diagnostic mechanism has been shown to motivate the health care workers working for TB. GeneXpert uptake has increased following the sensitization of health care workers at all levels of TB control. The new technology has been embraced as is demonstrated by a high number of samples being transported to the GeneXpert site for testing. This has created a strong collaboration between the clinicians and laboratory staff. The results demonstrated have motivated the NTP to support the GeneXpert testing. The project intends to roll out the GeneXpert testing to more sites and to work closely with the NTP to ensure the GeneXpert machines have been procured through the Global Fund.
- Improved collaboration between the NTP and CTB has resulted in an expansion of an EQA network for peripheral laboratories. NTP CTRL staff have been mentored and are currently being supported through CTB to carry out EQA supervisory visits to peripheral laboratories. Though the coverage for the country is still low due to insecurity and logistical challenges with travel, there has been an increase in EQA coverage in the 3 targeted states. The regular TWG for laboratory staff at CTRL, the NTP and CTB staff have developed a plan to ensure that the coverage has improved. TOT have been trained on EQA and are expected to decentralize EQA activities to the states. CTB will support the county TB focal people and train them on the sampling of slides. This will form part of their routine supervision in their respective counties. The outcome will be to improve on laboratory networking and the transportation of sampled slides from peripheral laboratories to the EQA central point in year 2. This has been planned for the Year 2 work plan for selected counties in 3 targeted states.
- Surveillance for MDR-TB among TB cases has increased since the introduction of GeneXpert testing at the CTRL. Use of boda boda riders has seen an increase in samples transported from less than 20 per month to over 250 per month. The RIF-resistant cases have been identified early enough and samples have been transported to Nairobi for culture and DST. The turnaround time for the results that are sent to Nairobi is less than 24 hours compared to the previous turnaround time which took months.
- Intensified case finding among the contacts of smear positive cases is a strategy that has been proven to have results. For 2-3 years, retrospective contact investigations were conducted in the 3 counties of Morobo, Lainya and Yei. The screening of household contacts have identified 15% smear positive TB cases compared to 8% (19/237) smear positive identified in 2014

through creating awareness about TB in the community. The yield of contact tracing is also more than 12 times of the general population estimates. The training on the basics of TB and community mobilization, the provision of tools and the provision of enablers to the community mobilizers have also proven to be key in this achievement. Despite the many challenges community mobilizers face in their work, routine (quarterly) meetings have shown to be an effective means of motivation since they provide mobilizers with the opportunity to share experiences with each other. CTB intends to link these groups with the Community Based Organizations (CBOs) to ensure closer supervision and monitoring of community based activities. These will be piloted in four counties in the year 2 workplan (See table 10 above).

- Expansion of TB treatment centers can improve the accessibility to drugs and adherence to treatment. Mapping the patients on TB treatment and linking them with the nearest health facility has proven possible. The four counties of Yei, Morobo, Juba and Lainya are piloting the strategy. The health care workers of the health facility (PHCC or PHCU) receive on-the-job training on TB treatment and the patients' drugs (for the duration of the patients' treatment) are then transferred to these centers. The patient is linked with the health care worker and community mobilizer from the location who are responsible to ensure the patients continue to receive treatment. Stories told by the patients prove the success of this strategy and the effect it has on treatment adherence. The expansion of treatment centers are planned in the Year 2 workplan. Recruitment of CBOs will support this strategy.

Annex I: Year 1 Results on Mandatory Indicators

Table 10: Year 1 Results on Mandatory Indicators

MANDATORY Indicators				
<i>Please provide data for the following mandatory indicators:</i>				
2.1.2 A current national TB laboratory operational plan exists and is used to prioritize, plan and implement interventions.	National APA 1	CTB APA 1	CTB APA 1 investment	Additional Information/Comments
Score as of September 30, 2015	0	N/A	None	The laboratory strategic plan and the operation plan will be developed in the second quarter of Year 2 workplan
2.2.6 Number and percent of TB reference laboratories (national and intermediate) within the country implementing a TB-specific quality improvement program i.e. Laboratory Quality Management System	National APA 1	CTB APA 1	CTB APA 1 investment	Additional Information/Comments
Number and percent as of September 30, 2015	0% (0/1)	N/A	None	The TB reference laboratory is structurally being re-designed, which will be followed by containment. It is expected to be functional by January 2015
2.2.7 Number of GLI-approved TB microscopy network standards met	National APA 1	CTB APA 1	CTB APA 1 investment	Additional Information/Comments

Number of standards met as of September 30, 2015	3 GLI-approved standards (September 2015)	N/A	None	Number of standards met: 3 out of 11 - 1 (NSP not yet endorsed by MoH), 2 and 6.
2.3.1 Percent of bacteriologically confirmed TB cases who are tested for drug resistance with a recorded result.	National 2014	CTB 2014	CTB APA 1 investment	Additional Information/Comments
Percent (new cases) , include numerator/denominator	0% (0/3,548)	n/a	Substantial	Surveillance has focused on re-treatment cases that are bacteriologically confirmed. The denominator excludes the categories of 'Others'. During the period, the samples were being transferred to Nairobi for culture and DST
Percent (previously treated cases) , include numerator/denominator	12.9% (52/404)	n/a		
Percent (total cases) , include numerator/denominator	1.3% (52/3,952)	n/a		
3.1.1. Number and percent of cases notified by setting (i.e. private sector, pharmacies, prisons, etc.) and/or population (i.e. gender, children, miners, urban slums, etc.) and/or case finding approach	National 2014	CTB 2014	CTB APA 1 investment	Additional Information/Comments
Number and percent	8,324	N/A	Substantial	The national reporting format does not segregate data by settings and case finding approach Data that is segregated by gender is incomplete because it only focuses on new bacteriologically confirmed cases Only segregate data for new cases by age group. thus, Children < 15 years comprises 19.1% (1592/8324)
3.1.4. Number of MDR-TB cases detected	National APA 1	CTB APA 1	CTB APA 1 investment	Additional Information/Comments
Total 2014	4	U	Substantial	With the introduction of GeneXpert, the number of samples referred for GeneXpert testing has increased. The samples with RIF-resistant TB are
Jan-Mar 2015	2	1		

Apr-June 2015	4	0		referred for Culture and DST in Nairobi. The number provided includes the RIF-Resistant cases and Culture DST results have not been received
Jul-Sept 2015	4	4		
To date in 2015	10	5		
3.2.1. Number and percent of TB cases successfully treated (all forms) by setting (i.e. private sector, pharmacies, prisons, etc.) and/or by population (i.e. gender, children, miners, urban slums, etc.).	National 2013 cohort	CTB 2013 cohort	CTB APA 1 investment	Additional Information/Comments
Number and percent of TB cases successfully treated in a calendar year cohort	Getting from WHO	n/a	Substantial	The reporting period lies within the TB CARE I period where the project was working at national level.
3.2.4. Number of MDR-TB cases initiating second-line treatment	National APA 1	CTB APA 1	CTB APA 1 investment	Additional Information/Comments
Total 2014	0	0	None	CTB not working in this area, but CTB is pushing WHO to finalize on the guidelines which have been pending for a while. Also, the drug order has been placed by UNDP (PR) and CTB is following on the procurement process.
Jan-Mar 2015	0	0		
Apr-June 2015	0	0		
Jul-Sept 2015	0	0		
To date in 2015	0	0		
3.2.7. Number and percent of MDR-TB cases successfully treated	National 2012 cohort	CTB 2012 cohort	CTB APA 1 investment	Additional Information/Comments
Number and percent of MDR-TB cases successfully treated in a calendar year cohort	Getting from WHO	n/a	Limited	No MDR-TB case management in South Sudan
5.2.3. Number and % of health care workers diagnosed with TB during reporting period	National 2014	CTB 2014	CTB APA 1 investment	Additional Information/Comments
Number and percent reported annually	n/a	n/a	None	Not routinely done. Planned in the year 2 workplan
6.1.11. Number of children under the age of 5 years who initiate IPT	National 2014	CTB 2014	CTB APA 1 investment	Additional Information/Comments
Number reported annually	n/a	n/a	None	Not routinely done. Planned in the year 2 workplan
7.2.3. % of activity budget covered by private sector cost share, by specific activity	National APA 1	CTB APA 1	CTB APA 1 investment	Additional Information/Comments
Percent as of September 30, 2015 (include numerator/denominator)	N/A	n/a	None	No local partners in Year 1

8.1.3. Status of National Stop TB Partnerships	National APA 1	CTB APA 1	CTB APA 1 investment	Additional Information/Comments
Score as of September 30, 2015	0	N/A	None	No national STOP TB partnership in place. Earlier attempt to form one has failed due to the volatile and dynamic environment in South Sudan
8.1.4. % of local partners' operating budget covered by diverse non-USG funding sources	National APA 1	CTB APA 1	CTB APA 1 investment	Additional Information/Comments
Percent as of September 30, 2015 (include numerator/denominator)	N/A	n/a	None	No local partners in Year 1
8.2.1. Global Fund grant rating	National APA 1	CTB APA 1	CTB APA 1 investment	Additional Information/Comments
Score as of September 30, 2015	B1 Adequate	N/A	Moderate	The Global Fund grant was signed by the Principal Recipient (UNDP). New NFM grant cover period from July 1, 2015 to December 31, 2017. New sub-recipients (SR) are being recruited in accordance to the DOTS expansion plan
9.1.1. Number of stock outs of anti-TB drugs, by type (first and second line) and level (ex, national, provincial, district)	National APA 1	CTB APA 1	CTB APA 1 investment	Additional Information/Comments
Number as of September 30, 2015	n/a	n/a	Limited	CTB is not working in this area. However, we are involved in quantification of the drugs need
10.1.4. Status of electronic recording and reporting system	National APA 1	CTB APA 1	CTB APA 1 investment	Additional Information/Comments
Score as of September 30, 2015	2	N/A	Limited	Pilot conducted in 3 TBMs in Juba county. Support is limited to supervision and DQA in these health facilities
10.2.1. Standards and benchmarks to certify surveillance systems and vital registration for direct measurement of TB burden have been implemented	National APA 1	CTB APA 1	CTB APA 1 investment	Additional Information/Comments
Yes or No as of September 30, 2015	No	N/A	None	Country still developing the vital registration system. TB data to be included in the DHIS at national level

10.2.6. % of operations research project funding provided to local partner (provide % for each OR project)	National APA 1	CTB APA 1	CTB APA 1 investment	Additional Information/Comments
Percent as of September 30, 2015 (include numerator/denominator)	N/A	N/A	None	Not planned in Year 1 workplan
10.2.7. Operational research findings are used to change policy or practices (ex, change guidelines or implementation approach)	National APA 1	CTB APA 1	CTB APA 1 investment	Additional Information/Comments
Yes or No as of September 30, 2015	N/A	No	None	Not planned in Year 1 workplan
11.1.3. Number of health care workers trained, by gender and technical area	CTB APA 1		CTB APA 1 investment	Additional Information/Comments
	Number trained males APA 1	Number trained females APA 1	Total Number trained in APA 1	Total Number planned trainees in APA 1
1. Enabling environment	72	24	96	96
2. Comprehensive, high quality diagnostics	31	17	48	45
3. Patient-centered care and treatment	100	34	134	120
4. Targeted screening for active TB			0	
5. Infection control			0	
6. Management of latent TB infection			0	
7. Political commitment and leadership			0	
8. Comprehensive partnerships and informed community involvement			0	
9. Drug and commodity management systems			0	
10. Quality data, surveillance and M&E			0	
11. Human resource development			0	
Grand Total	203	75	278	261
11.1.5. % of USAID TB funding directed to local partners	National APA 1	CTB APA 1	CTB APA 1 investment	Additional Information/Comments
Percent as of September 30, 2015 (include numerator/denominator)	N/A	0% (0/2,204,268)	Substantial	There was a delay in the recruitment of the CBOs. The process of providing sub-awardee is in the final stage. The amount allocated for CBOs is \$ 225,749. This will be carried over to APA 2.

Annex II: Status of EMMP activities

Table 11: Status of EMMP activities in South Sudan in Year 1 workplan

Year 1 Mitigation Measures	Status of Mitigation Measures	Outstanding issues to address in Year 2	Additional Remarks
Disposal procedures are already a topic in the biosafety session of the laboratory training manual. Ensure disposal procedures are covered in any CTB-supported laboratory trainings.	On-going.	None	Training curriculum for laboratory health workers includes a session on biosafety.