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**TB CARE I**

# **TB CARE I - Kenya**

**Final Report**

**October 1, 2010 – September 30, 2013**

**September 30, 2013**

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## List of Abbreviations

ACF	Allocable Cost Factor
AFB	Acid Fast Bacilli
APA	Annual Plan of Action
CDC	Centers for Disease Control and Prevention
CRL	Central Reference Laboratory
DHIS	Data Health Information System
DLTLD	Division of Leprosy, Tuberculosis and Lung Disease
DR TB	Drug Resistant Tuberculosis
DOTS	Directly Observed Treatment Short course
DST	Drug Sensitivity Testing
EQA	External Quality Assurance
HCW	Health Care Worker
HIV	Human Immunodeficiency Virus
ICT	Information and Communication Technology
IPT	Isoniazid Preventive Therapy
JICA	Japan International Cooperation Agency
KANCO	Kenya AIDS NGOs Consortium
KAPTLD	Kenya Association for Prevention of Tuberculosis and Lung Disease
KNCV	KNCV Tuberculosis Foundation
M&E	Monitoring & Evaluation
MDR-TB	Multi-Drug Resistant Tuberculosis
MSH	Management Sciences for Health
OR	Operation Research
PMDT	Programmatic Management of Drug Resistant Tuberculosis
PPM	Public-Private Mix
SOP	Standard Operating Procedures
TA	Technical Assistance
TB	Tuberculosis
TB-IC	Tuberculosis Infection Control

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## Executive Summary

This is the final report of TB CARE I-Kenya, implemented by four partners of the Tuberculosis Coalition for Technical Assistance (TBCTA): KNCV Tuberculosis Foundation (KNCV--lead partner), the American Thoracic Society (ATS<sup>1</sup>), FHI 360<sup>2</sup> and Management Sciences for Health (MSH). Two local organizations were also sub-contracted by KNCV: Kenya Association for Prevention of Tuberculosis and Lung Disease (KAPTLD) and Kenya AIDS NGOs Consortium (KANCO).

This report is a summary of TB CARE I achievements in Kenya with lessons learned and recommendations. The project supported the Division of Leprosy, Tuberculosis and Lung Disease (DLTLD) for three years with a total investment of USD 12 million. The project had national coverage reaching a total population of about 40 million people.

All eight TB CARE I technical areas were supported over the life of the project: 1) Universal and Early Access; 2) Laboratory Strengthening; 3) Infection Control; 4) Programmatic Management of Drug Resistance TB; 5) TB/HIV, 6) Health Systems Strengthening; 7) M&E, Surveillance and Operations Research and 8) Drug and Commodity Management.

### Four major achievements

The heart of the project was support for DLTLD operations; namely supportive supervision and quarterly review meetings. TB CARE I provided 100% support for the DLTLD supervision system at the district, provincial and national level. Over the last three years, 62,982 supervision visits out of 87,605 scheduled visits (72%) were conducted to health facilities countrywide - the equivalent of 84 visits each day (250 working days per year). All planned quarterly review meetings at the district and provincial level took place. These activities ensured DLTLD collected data on a regular basis, maintained contact with health facilities, and issues affecting implementation of TB control activities were identified and the necessary decisions were made to maintain quality TB care.

TB CARE I's investment to increase participation of all care providers in TB care and control activities had major results. By Year 3, the number of private facilities providing TB services increased from 187 treatment and 147 diagnostic centers in 2009 to 251 treatment (34% increase) and 237 diagnostic centers (61% increase) in 2013. Furthermore, prior to TB CARE I support in Kenya, in 2009, the private sector notified 3,156 TB cases which was equivalent to 3% of national case finding. By the end of TB CARE I, the private sector notified 10,392 TB cases in 2012 which translates to about 10% of national case finding.

Through TB CARE I, Kenya significantly strengthened its laboratory sputum-smear External Quality Assurance (EQA) system. The EQA coverage prior to USAID support was as low as 28% (of 930 laboratories, baseline in 2008) and this was significantly increased to the current coverage of 88% (of 1800 laboratories) in 2012, which is above the WHO standard of 80% EQA coverage. Additionally, the EQA error rates have significantly dropped from 14% in 2008 to 2.8% in 2012 which is below the WHO allowable error rate of 5%. Furthermore, the project was successful in supporting DLTLD to increase the amount of retreatment cases screened for drug resistance at CRL--from 59% (5,930/10,000) in 2010 to 89% of retreatment cases (8,870 out of 10,686).

With support from TB CARE I, DLTLD is implementing an innovative web based TB program management system integrated with mobile technology--the first of its kind to be implemented in Africa. TIBU ("to treat" in Swahili) is a unique system developed for use by DLTLD based on a two pronged approach that enables the TB program to easily access data for informed decision-making at all levels: 1) It is strengthening and improving recording and reporting with real time data from the facility level up to the central unit, as well as provision of feedback; and 2) TIBU is also strengthening and improving governance and accountability through utilization of mobile money transfer to make payments for supervision.

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<sup>1</sup> APA1 only

<sup>2</sup> APA1 only

## Introduction

Kenya is one of the 22 high TB burden countries and is ranked 16<sup>th</sup> according to the WHO Global Tuberculosis Report 2012. USAID support for Kenya TB control activities started with TB CAP (2005-2010) in 2008. Kenya attained the global TB control targets (84% Case Detection and 87% Treatment Success Rate) in 2007 and therefore the strategic approach for TB CARE I focused on maintaining gains and quality to diagnosis and treatment for TB and MDR-TB while further increasing case detection.

KNCV Tuberculosis Foundation (KNCV) was the lead partner for the TB CARE I project (the Project) in Kenya during the three years of project implementation. KNCV collaborated with three TBCTA partners, Management Sciences for Health (MSH), FHI 360 and American Thoracic Society (ATS); and two local implementing partners, Kenya Association for Prevention of Tuberculosis and Lung Disease (KAPTLD) and Kenya AIDS NGOs Consortium (KANCO), sub-awarded by KNCV. The geographic coverage of TB CARE I project was national through the support provided to the TB Program countrywide. The TB CARE I project was headed by the Country Director, whom worked closely with a team of staff providing M&E, Finance & Admin and logistic support to the project. The implementation of the project was guided by specific project guidelines (a Memorandum of Understanding) based on the TB CARE I Operations Manual and advice by the Division of Leprosy, Tuberculosis and Lung Disease (DLTLD).

Initially, TB CARE I was envisioned to be a five-year project. However, after the second year of implementation, there was a change of strategy as the USAID country Mission decided to transition to a bilateral support mechanism. Therefore, year three of the project was the last year with activities ending by June 29, 2013 and project close out completed by September 30, 2013. Over the three years of project implementation, a total of 12 million USD were invested.

In Kenya, TB CARE I addressed eight technical areas outlined below:

Technical Area	Expected Outcomes
1. Universal and Early Access	1.1 Increased demand for and use of high quality TB services and improve the satisfaction with the services provided (Population/Patient Centered Approach) 1.2 Increased quality of TB services delivered by all care providers (Supply)
2. Laboratories support	2.1 Ensured capacity, availability and quality of laboratory testing to support the diagnosis and monitoring of TB patients 2.2 Ensured optimal use of new approaches for laboratory confirmation of TB and incorporation of these approaches in national strategic laboratory plans
3. Infection Control	3.1 Increased TB-IC Political Commitment
4. Programmatic Management of Drug Resistant TB	4.1 Improved treatment success of MDR-TB
5. TB/HIV	5.2 Improved diagnosis of TB/HIV co-infection
6. Health System Strengthening	6.1 TB control is embedded as a priority within the national health strategies and plans, with matching domestic financing and supported by the engagement of partners 6.2 TB control components (drug supply and management, laboratories, community care, HRD and M&E) form an integral part of national plans, strategies and service delivery

7. M&E, OR and Surveillance	7.1 Strengthened TB surveillance 7.2 Improved OR plans and implementation 7.3 Improved capacity of NTPs to analyze and use quality data for the management of the TB program
8. Drug Supply Management	8.1 Ensured nationwide systems for a sustainable supply of drugs

## Universal Access

TB CARE I partners (KNCV and MSH) and two local sub-awardees (KAPTLD and KANCO) were involved with activities under this technical area. The activities supported included the development of guidelines, engaging TB patients in TB control activities and strengthened collaboration of the private sector with the DLTLD. The total investment under this technical area over the three years was \$1.7 million, equivalent to 14.2% of the total TB CARE I investment.

## Technical Outcomes

Expected Outcomes		Outcome Indicators	Indicator Definition	Baseline (Year or timeframe)	Target	Result	Comments
					Y2	Y2	
1.1	Increased demand for and use of high quality TB services and improve the satisfaction with the services provided (Population/ Patient Centered Approach)	TB personnel trained on the Patients' Charter	Number of TB personnel trained on Patient Charter	0 (baseline 2012)	90	94 (38 males, 56 females)	By the close of the project a total of 176 TB Advocates trained were still actively providing support. 94 TB advocates were trained on the Patient Charter
1.2	Participation of TB patients in TB control	Proportion of TB facilities with patient support group	Numerator: Number of TB facilities with patient support groups Denominator : Total number of facilities targeted	0 (baseline 2010)	10	12	Through TB CARE I, KANCO established and supported TB Patient groups in 12 health facilities. The TB support groups conducted outreach activities to create awareness on TB and reduce stigma associated with TB in their communities
1.3	Increased quality of TB services delivered among all care providers (Supply)	Private providers collaborating with NTP	Number of private facilities providing TB services (treatment and diagnostic)	187 treatment centers  148 laboratories  (baseline 2010)	215 treatment centers	251-treatment centers  237-laboratories	Private providers were trained, supervised and provided routine data, in exchange for TB drugs to be provided free-of-charge to patients. The laboratory staff were trained on EQA and provided with support

							supervision
		TB cases diagnosed by private providers	Numerator: Number of cases notified by private sector Denominator : Total National notification	3% (3,156/106,083)  (baseline 2010)	5%	10% (10,392 TB cases out of 97,922 cases were notified by the private sector in 2012)	Through the engagement of the private sector, private providers (formal and informal providers) were trained, supervised and provided routine data. Case detection was also increased through the establishment of sputum collection sites in slum areas where there were no diagnostic services.
		Number of TB cases (all forms) diagnosed in children 0-4	Number of TB cases (all forms) diagnosed in children 0-4	2,500  (baseline 2012)	5,000	5,369	TB CARE I supported the development of guidelines for pediatric case finding and job aids which are used by the health care providers

## Key Results

### Development of guidelines

The project aimed at enhancing early access to quality diagnosis and treatment for at risk populations such as children, women and people living with HIV (PLHIV). To achieve this, the project supported the development of Childhood TB guidelines and Quality Assurance for Chest X-rays guidelines, which are now being used countrywide.

### Participation of TB patients in TB control

KANCO established and supported TB patient support groups in 12 health facilities across five regions. The patient support groups are comprised of ex-TB patients who are referred to as TB Advocates. The TB Advocates acted as "TB champions" within the communities. They conducted outreach activities in public places such as public schools, places of worship, open markets and alcohol drinking establishments. During such events, they created awareness on TB by sharing information on topics such as: what is TB, how the disease is transmitted, TB treatment and MDR-TB. TB Advocates also provided answers to some of the concerns the community members had on TB. As a result, stigma associated with TB reduced within the communities as narrated in one of the success stories where TB Advocates were conducting community awareness outreach activities. The TB advocates provided support to TB patients who were still taking medication and also supported the health care workers by tracing those who had stopped taking medication within their communities. A success story

highlighting the experience and work of a TB Advocate by the name Stephen Anguva is attached (annex 1). Stephen was very ill with TB when a community member helped him get treatment; he was cured and successful in combating stigma within his own family. Stephen is now a motivated community health care worker, TB advocate and initiator of PAMOJA GROUP a TB CSO within his community

### **Patient Charter**

KANCO conducted an assessment of the knowledge of the TB Patients' Charter among TB patients. The results indicated that most TB patients were not aware of the Patient Charter, although the Charter is an insert to the patient packs of TB medicines. In response to these findings, 94 TB advocates (38 males, 56 females) were trained on the Patients' Charter from five regions where KANCO is implementing their activities. Although the training took place at the end of the Project and we are not able to directly measure their effect, it is anticipated that the TB Advocates will in turn educate the Patients on the Patients' Charter as they support them during treatment. The training was well received by the TB advocates and as a way forward, they promised to educate the TB patients on their rights and responsibilities. This will enhance dialogue and improve communication between patients and health care providers enabling a more patient centered environment. In addition, the TB Advocates committed themselves to work closely with the communities they are serving to prevent transmission of TB. Other parts of the country can benefit from the scale-up of training TB patients by improved communication between the two groups which can potentially lead to better treatment outcomes.

### **Increased quality of TB services delivered among all care providers**

Through KAPTLD, TB CARE I contributed to the enhancement of private sector engagement in TB control activities. Over the last three years, 251 formal private health care providers offering TB treatment services and 237 private laboratories were engaged in national TB control activities. In addition, TB CARE I supported informal private health care providers in four districts (two in Nairobi and two in Coast region) within the slum areas. The support included supportive supervision and capacity building to enable the private providers to diagnose and treat TB effectively. Furthermore, 26 sputum collection centers were established in the slum areas to increase TB case finding among the residents of the slum areas. Since there were no laboratories conducting AFB microscopy, TB CARE I support was used to establish sputum collection sites in the slum areas. Trained CHWs were supported to transport the sputum specimen to the nearest laboratories where AFB microscopy was done. As a result of these efforts, there has been an increase in case finding by the private sector. By the closing of TB CARE I, the number of private facilities providing TB services increased from 187 treatment and 147 diagnostic centers in 2009 to 251 treatment (34% increase) and 237 diagnostic centers (61% increase) in 2013. The case finding within the private sector also increased. Prior to TB CARE I support in Kenya, in 2009, the private sector notified 3,156 TB cases which was equivalent to 3% of national case finding. By the end of TB CARE I, the private sector notified 10,392 TB cases in 2012 which translates to about 10% of national case finding.

### **Lessons Learned**

1. Active participation of TB patients (and ex-TB patients) in TB control activities should be encouraged as these groups of people can be very helpful in creating awareness on TB and thus reducing stigma associated with TB. They can also support patients on treatment, as well as help trace patients who have discontinued treatment to increase better TB treatment outcomes.
2. Although the TB Patients' Charter is enclosed within the patient medication pack, there are many patients who are not informed about the Patients' Charter. Health care workers should share this

information with TB patients as part of the initial counseling session before patients are put on treatment. Inclusion of the Patient's Charter in pre- and in-service training curricula for all levels of health care providers should be considered.

- While engaging all care providers, it is important not only to work with formal private providers but also informal providers who are based in slum areas as these groups of providers also provide TB services to the populations they are serving. These groups of providers should be supported to provide quality services. For example in areas where diagnostic services are not available, establishing sputum collection sites that collaborate with TB diagnostic centers within these areas can help increase case finding.

## Laboratories

MSH was the lead partner providing laboratory support. The project's main approach to providing support was through a Laboratory Quality Assurance Officer (MSH). He worked closely with the DLTLTD and Central Reference Laboratory (CRL) on External Quality Assurance (EQA) activities for AFB microscopy labs, capacity building of lab personnel at all levels, introduction of new TB lab diagnostic technologies and strengthening of culture and DST. The total investment for this technical area was \$ 1.6 million over the three years of project implementation, 13% of the total three year investment.

### Technical Outcomes

Expected Outcomes		Outcome Indicators	Indicator Definition	Baseline (2009)	Target	Result	Comments
					Y3	Y3	
2.1	Ensured capacity, availability and quality of laboratory testing to support the diagnosis and monitoring of TB patients	Laboratories with working internal and external quality assurance programs for tests that they provide including: a) smear microscopy, b) culture, c) DST, and d) rapid molecular test	Numerator: Number of laboratories enrolled in EQA program meeting description above both nationwide and TB CARE areas  Denominator: All laboratories (national and TB CARE areas separately) that perform one or more of the above TB diagnostics	57% (732/1,283)	80%	88% (1,584/1,800)	See graph below
		Proportion of retreatment specimens submitted for culture/DST	Numerator: Number of retreatment specimens submitted=about 75,000 Denominator: Number of total retreatment cases	59% (5,930/10,000)	75	89% (8,870/10,686)	In 2012, 89% of retreatment cases (8,870 out of 10,686) were screened for drug resistance

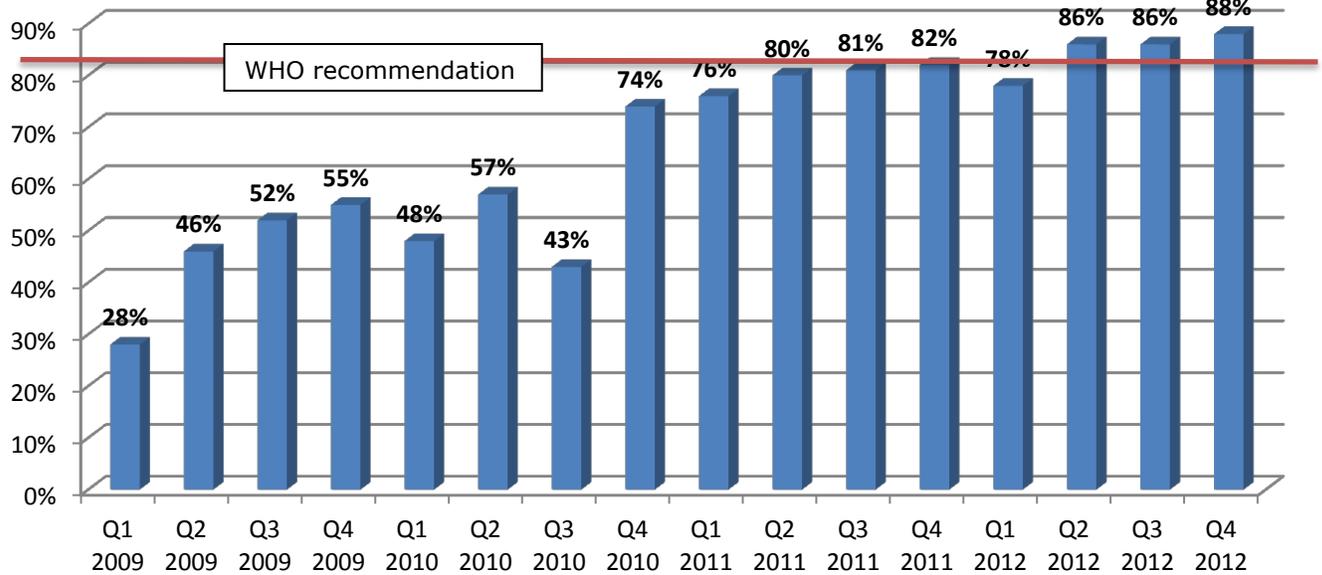
			notified=about 10,000				at the CRL.
2.3	Ensured optimal use of new approaches for laboratory confirmation of TB and incorporation of these approaches in national strategic laboratory plans	Laboratories offering rapid tests for TB or drug-resistant TB	Number of laboratories using GeneXpert MTB/RIF and HAIN MTBDRplus disaggregated by type of technology and also disaggregated by national and TB CARE areas.	0	3	3	3 Gene Xpert machines procured with TB CARE I support and installed in 3 laboratories in Coast region
		Rapid tests conducted	Annual number of tests (separately for GeneXpert MTB/RIF and HAIN MTBDRplus) conducted	0	2,000	1,882	

### External Quality Assurance

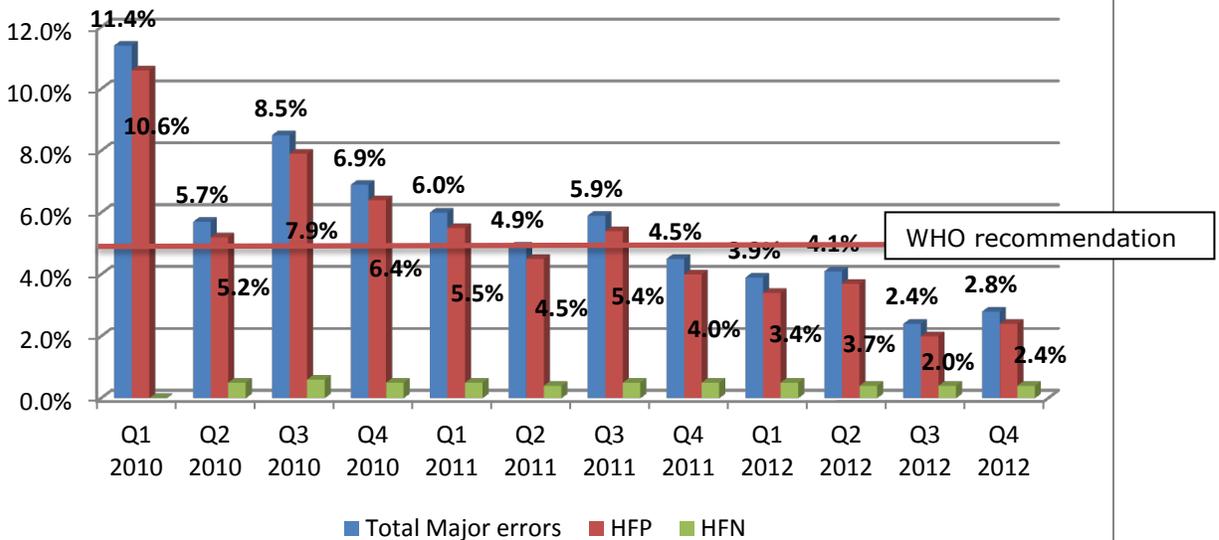
Over the last three years of TB CARE I support, the technical capacity of laboratory health workers to provide quality AFB microscopy services at all levels (national, provincial, district and facility) of the laboratory network was significantly increased.

In collaboration with JICA, TB CARE I supported the establishment and operations of an EQA center at the Central Reference Laboratory (CRL) with a focal person to support EQA activities countrywide. These efforts greatly contributed to the sustained high level of both the EQA coverage and the quality of smear microscopy diagnostic services in the country. The EQA coverage prior to USAID support was as low as 28% (of 930 laboratories, baseline in 2008) and this has significantly increased to the current coverage of 88% (of 1,800 laboratories) in 2012 which is above the WHO recommended coverage of 80%. Additionally, the EQA error rates have significantly dropped from 14% in 2008 to 2.8% in 2012 which is below the WHO allowable error rate of 5% (please refer to figure 1 and 2 below).

## EQA Coverage upto Quarter 4 2012



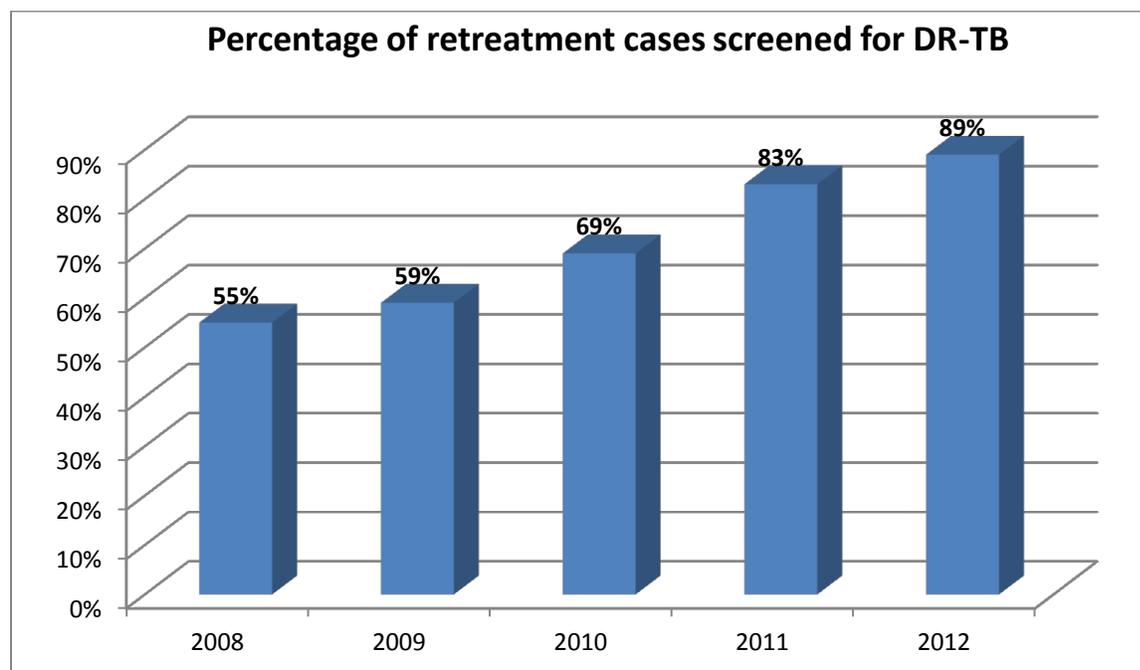
## Error rates



## Specimen referrals

Through TB CARE I, the CRL was also strengthened to handle specimens for culture and DST. The implementation of an MDR TB surveillance system was supported by a unique transportation system of sputum specimen from the peripheral laboratory facilities in the country to the Central Reference Laboratory and thus achieving 100% coverage for specimen referrals. The system was designed by the CRL and TB CARE I, and was financially supported by TB CARE I. This achievement is unique in Africa as most countries are only able to focus coverage to specific areas that are easy to reach.

Courier services are only available in major towns in the country, thus for facilities that are far away from the major towns, specimens were transported by motor bike or public transport from the peripheral facilities to the respective courier points and then further to the CRL in Nairobi. The percentage of retreatment cases screened for drug resistance significantly increased to 89% in 2012 from 61% in 2009 before TB CARE I support (Please refer to graph below as well as success story in Annex 2).



The project has been supporting the DLTLD to improve tuberculosis case detection; including smear-negative disease often associated with HIV as well as expanded capacity to diagnose multidrug-resistant tuberculosis (MDR-TB). In September 2011, the project acquired the first three GeneXpert machines to be used within the public sector in the country. So far a total of 1,882 samples have been tested using the machines, out of which 761 samples were MTB positive with 83 new TB cases diagnosed. The RIF resistant cases diagnosed by end of June 2013 were 38 with 32 confirmed as MDR TB. In addition, the GeneXpert machines have contributed to increased case detection among PLHIV (65% of new cases diagnosed by GeneXpert are HIV+ SSM-). The time to diagnosis for RIF resistant cases in areas with GeneXpert machines also reduced from several weeks to a few days. Until as recent as the end of APA 2, TB CARE I was the only partner reporting GeneXpert data to the DLTLD and the reporting format will be adapted nationally.

### **Lessons Learned/recommendations**

1. The establishment of the EQA center at CRL through the partnership of TB CARE I, JICA and Global Fund support greatly contributed to the improvement of performance of laboratories in AFB microscopy. An officer at CRL was appointed to continue providing EQA support. However, the officer is also designated to other duties within CRL and this has hindered him from providing adequate EQA support. The DLTLD/CRL should empower the EQA officer to dedicate his time for EQA activities including data analysis and EQA data quality assessment.
2. Coordination of partners implementing GeneXpert in the country has not been strong. Until end of APA 2, TB CARE I was the only partner reporting GeneXpert data to the DLTLD. There is need to

establish a specific task force to oversee and coordinate the GeneXpert MTB/Rif implementation and roll out in the country. This team should also coordinate GeneXpert reporting as well as the existing GeneXpert supply management system.

3. To support the specimen referral system, standard specimen packaging material should be procured and distributed to all the regions in the country. There is no standard packaging material throughout the country in compliance to safety regulations for infectious materials. To correct this problem, it is better to have a standard packing material for the specimens to be used by all the facilities in the country.

## Infection Control

KNCV was the lead partner for this technical area and the main activity was to develop a TB Infection Control training curriculum. The total investment over the three years was \$300,000—2.5% of the three year investment.

### Technical Outcomes

Expected Outcomes		Outcome Indicators	Indicator Definition	Baseline (2011)	Target Y2	Result Y2	Comments
3.1	Increased TB-IC Political Commitment	3.1.4 TB-IC training material developed	TB-IC training materials developed Indicator Value: Yes/No	N	Y	Y	The training curriculum is being used by DLTLD for trainings supported by Global Fund.

### Key Results

Under this technical area, the project was primarily focused on developing a TB Infection Control training curriculum that would be used to train health care workers. The TB-IC training curriculum was finalized in APA 2 but due to budget constraints the curriculum was not printed. However, this did not stop the DLTLD from using PDF versions of the curriculum for trainings supported by Global Fund.

## Programmatic Management of Drug Resistant TB (PMDT)

KNCV was the lead partner for this technical area and the focus was on providing support to MDR-TB patients to enable them to adhere to treatment for better outcomes. The technical assistance provided included support for clinical investigations for the patients, transport and meal allowance. The total investment for APA 1 and 2 was \$ 950,000, about 8% of the total TB CARE I investment. In APA 3 this activity was supported by Global Fund.

### Technical Outcomes

Expected Outcomes		Outcome Indicators	Indicator Definition	Baseline (2011)	Target Y2	Result Y2	Comments
4.1	Improved treatment success of MDR-TB	4.1.5 MDR Patients getting patient support through CARE I	Number of MDR patients getting patient support package through TB CARE I	160	210	298	100% (298) of MDR TB patients are supported through TB CARE I.  MDR-TB treatment success rate increased from 64% in 2009 to 83% in 2010

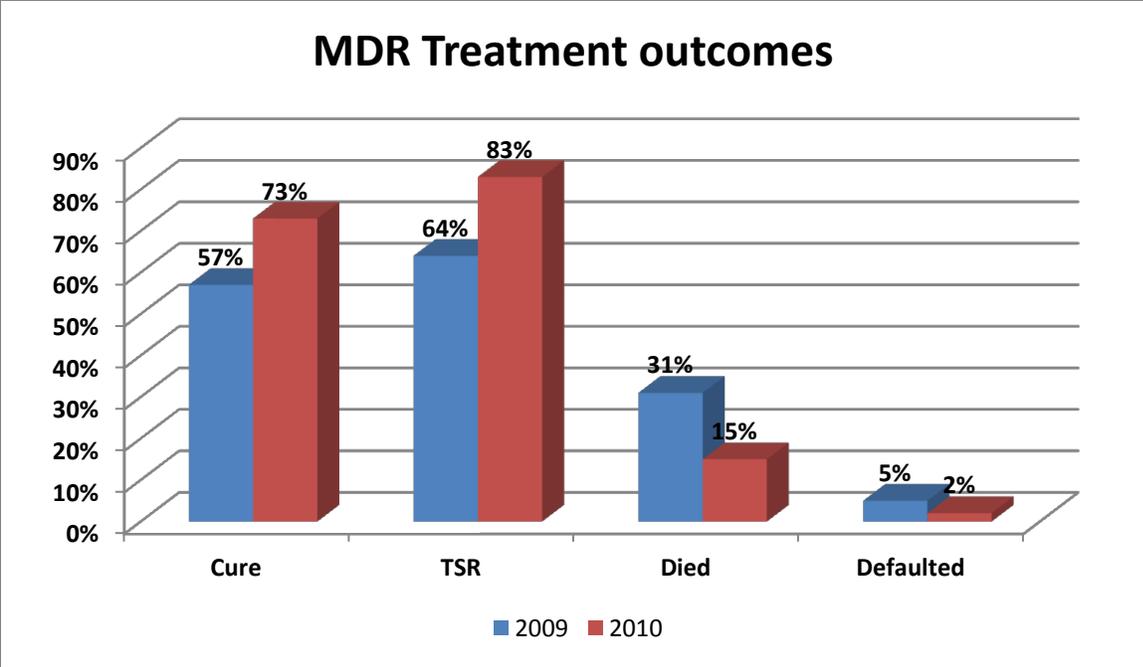
### Key Results

In Kenya MDR-TB treatment has been decentralized to 134 treatment sites distributed throughout the country. TB CARE I provided direct support to MDR-TB patients since 2008 through its predecessor TB CAP. The support provided by TB CARE I consisted of a package comprising:

- 500 Ksh per day for transport and food costs (U\$?)
- 6,000 Ksh for initial lab investigations
- 1,500 Ksh every other month for follow-up lab investigations

By the end of APA 2, 296 MDR TB patients were enabled to adhere to their medication through provision of nutritional support, transport to health facilities and clinical investigations. Due to the increase of MDR patients and funding constraints, support was provided in collaboration with the Global Fund project. In the last year of the project, TB CARE I was not able to continue patient support due to lack of funding. However, the Global Fund project agreed to take over the support until June 2013. Patient support is a vital contribution to successful treatment outcomes for MDR TB; the MDR TB treatment success rate increased from 64% in 2009 to 83% in 2010 (see graph below).

TB CARE I supported the development of several key PMDT documents namely the National PMDT Guidelines and PMDT training materials. Both of these documents were printed with Global Fund support and are currently in use by DLTLD.



**Lessons Learned/recommendations**

1. The current system used for payment of MDR-TB patient support was not very efficient. The support for MDR-TB patients was provided through DTLCs and HCWs. While in most cases the support did reach the patient it was actually difficult to monitor if the money reached the beneficiary and in good time.

To address this challenge, it was proposed to include MDR patient support as a component of TIBU, an innovative ICT solution developed to support Program Management. TIBU, as will be described below under the Health system strengthening section, makes use of Mpesa (mobile money transfer through telephone sim cards) to make payments for supervision. It is envisaged that this same system can be used for MDR TB patient support. However, discussions are ongoing about MDR patient support and specifically about what should be included in the package. It is expected that when the TIBU system is rolled out in phase three, MDR patient support will be included.

2. Currently, there is no standard package for MDR-TB patient support in the country. Different partners are providing different types of support which mostly includes some money for transport, meals and nutritional supplement based on the BMI status of the patient. On the other hand MDR-TB patients also have different needs for support; some are poor and need full support while others may only need some psycho-social support, which is not included in any support package.

It is important for DLTLD and its partners to agree on a standard package including criteria for support, how the support will be administered (DTLTC, HCW or TIBU) and how to monitor the support. Was the support received and how are patients benefitting? In addition, as MDR patient numbers are growing it is important to take into consideration what is included in the support package—what is feasible and sustainable? For example, what type of transport support is given—money or vouchers? Is it possible to give food and nutritional supplements instead of money and how can lab investigations best be supported?—agreements with laboratories? Finally, how can psycho-social support be provided to MDR patients to cope with and adhere to treatment.

## TB/HIV

The partners involved in implementing activities under this technical area were KNCV and FHI360. The activities focused on improved reporting of IPT as well as TB/HIV uptake within the Gold Star Network. The total investment over the project duration was \$600,000, 5% of the total TB CARE I investment.

### Technical Outcomes

Expected Outcomes	Outcome Indicators	Indicator Definition	Baseline (2011)	Target	Result	Comments	
				Y2	Y2		
5.1	Improved TB/HIV uptake in GSN	Proportion of Gold Star Network (GSN) members reporting on TB/HIV	Numerator: Number of GSN members reporting on TB/HIV Denominator: Total number of targeted GSN	0	10/10	27/10	

### Key Results

The Gold Star Network (GSN) is a network of private providers delivering HIV care in Kenya, operating from Nairobi with regional presence in Nairobi, Central, Coast and Rift Valley. TB CARE I through FHI360 supported the GSN members to implement integrated TB/HIV care services.

FHI360 in collaboration with Gold Star Network provided technical and operational support to the GSN members to offer TB diagnosis and treatment services in addition to the HIV care services they were already providing. As a result, a total of 27 providers within the GSN network started reporting on TB/HIV activities using the standard TB and HIV reporting tools. Out of the 27 providers, 18 started providing both TB diagnostic and treatment services while 9 providers started TB treatment services.

To improve care of TB/HIV co-infected patients, the DLTLTD was supported to develop an IPT data collection tool for improved IPT reporting. The tools are ready for use.

## Health System Strengthening (HSS)

The core of TB CARE I support was provision of supportive supervision, operational costs and TIBU. The lead partner was KNCV and the total investment over the three years was \$6 million—50 % of the full three year investment.

Supportive supervision is one of the core management activities of any TB Program and was supported by the project extensively. Supervision is carried out regularly to monitor performance and improve the quality of the program by supporting health facility staff with on-the-job training. Supervision also provides an opportunity to discuss and solve systematic problems that contribute to poor TB care delivery. Supervision ensures that data is regularly collected from the facility level to be used for reporting at all levels to monitor performance and make policy decisions to continuously improve the management of the TB program.

### Technical Outcomes

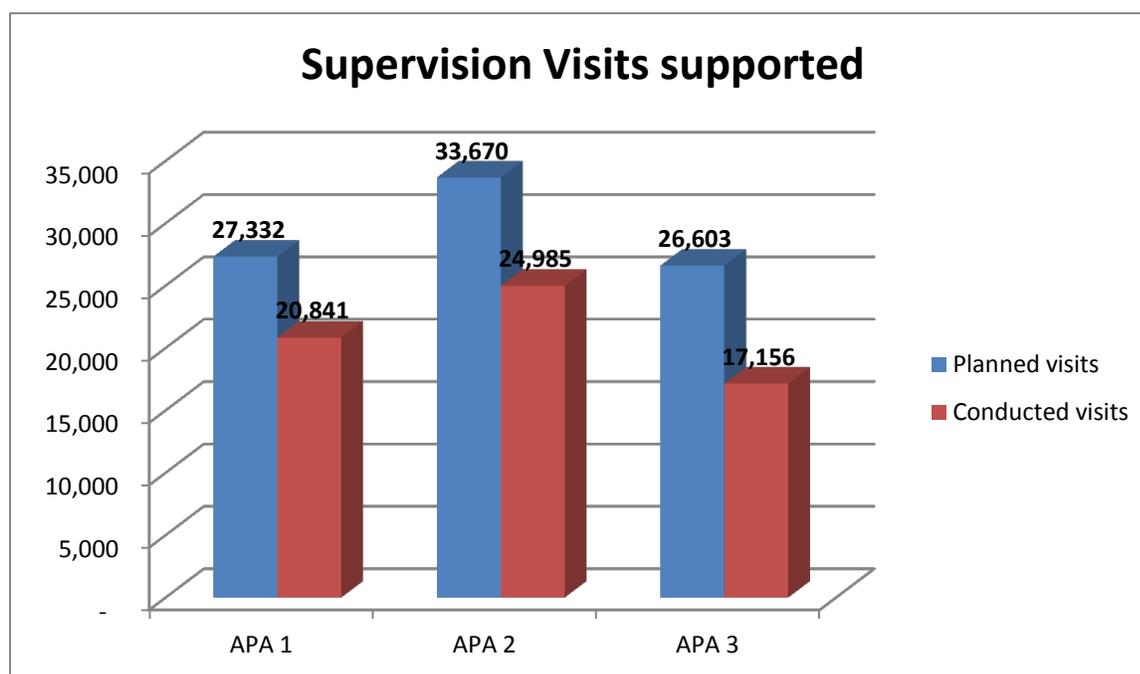
Expected Outcomes		Outcome Indicators	Indicator Definition	Baseline (2009)	Target Y2	Result Y2	Comments
6.1	TB control is embedded as a priority within the national health strategies and plans, with matching domestic financing and supported by the engagement of partners	Use of new technology in TB program Management	Real time reporting using mobile technology in place for program management  Indicator Value: Yes/No	N	Y	Y	
6.2	TB control components (drug supply and management, laboratories, community care, HRD and M&E) form an integral part of national plans, strategies and service delivery	Supervisory visits conducted according to country supervisory standards	Number of annual supervisory visits conducted to DOTs sites  Denominator: Number of annual supervisory visits planned	76%	80%	72% (62,982/87,605)	Even though the percentage result is low, the number of visits conducted increased each year apart from the last quarter of APA 3 in which only 40% of the schedules supervision visits were conducted due to budget constraints.
6.3	Strengthened quality management system of the DLTLD	ISO Certification	ISO Certificate received	N	Y	N	Activity started but not completed by the end of the project

### Supportive Supervision

The Kenyan TB program supportive supervision system is comprehensive and covers a complex decentralized TB program. DLTLD has 258 District TB and Leprosy Coordinators (DTLCs) and 12 Provincial TB and Leprosy Coordinators (PTLCs) covering 12 regions for supervision. The DTLC is tasked to conduct 12 facility visits per month using a standard supervision check list. The PTLC conducts four district visits per quarter and the Central Unit aims to visit 12 regions per year.

The DLTLD supervision system is often credited with being the major contributor to Kenya reaching and surpassing the global TB targets in 2006. With support from TB CARE I, Kenya has been able to maintain supervision at all levels (national, provincial and district). Over the three years, 62,982 supervision visits out of 87,605 visits (72%) scheduled were conducted to health facilities countrywide. During the last quarter of APA 3, only 40% of the scheduled supervision visits were conducted due to the phasing out of TB CARE I support.

The supervision visits have continuously enabled the TB program to identify and address issues (at the health facility level) early enough to make corrective decisions and improve the performance of the TB program. A good example is when the District TB coordinators visit health facilities and notice the drug supplies are running low; they are able to inform the Provincial TB Coordinators who can follow-up with relevant people and ensure the drugs are supplied before they completely run out. Additionally, the District TB Coordinators provide on-the-job training for health care workers at the facilities for new staff, on new developments and simple refreshing of standard procedures. This is very important especially in areas where there is high staff turnover or where HCWs go through work station rotations, the focal person for TB in such health facilities changes very frequently. This means that their replacement needs to be given proper orientation and support to implement TB control activities otherwise they may not be able to provide proper care and support for the TB patients registered in their facilities.



**TIBU: Use of Innovative Technology to Improve Kenya TB Program Management**

With support from TB CARE I, DLTLD is implementing an innovative web based TB program management system integrated with mobile technology—the first of its kind to be implemented in Africa. TIBU (‘to treat’ in Swahili) is a unique system developed for use by the Division of Leprosy, Tuberculosis and Lung Disease (DLTLD) in Kenya to specifically address challenges in data management and ensure tracking and monitoring of all TB patient data throughout the country. TIBU is based on a two pronged approach that enables the TB program to easily access data for informed decisions at all levels. It is strengthening and improving recording and reporting with real time data from the facility level up to the central unit, as well as provision of feedback. TIBU is also

strengthening and improving governance and accountability through utilization of mobile money transfer to make payments for supervision and provide MDR-TB patient support.

In practical terms, TIBU is used in the field to document/capture regular monitoring activities like supervision and EQA. Data is collected electronically with mobile computer tablets and uploaded into the central database of the DLTLTD. The data is immediately available for analysis and TIBU can generate cohort reports on case finding, treatment success, MDR incidence and mapping of specific TB issues. In addition, TIBU can be used for logistics planning of commodities and MDR patient support. To enable integration, TIBU is also linked with the national District Health Information System (DHIS2) for TB data sharing at the Ministerial level.

TIBU was developed through a unique partnership led by the DLTLTD and USAID Kenya with TB CARE I and three Kenya ICT companies--Safaricom, Iridium Interactive and Tangazoletu. USAID Kenya is the sole financial supporter and DLTLTD is in the driving seat of TIBU's development as they provide the input for the system; knowledge of how TB is managed in Kenya and expressing the needs from the field. DLTLTD also is training staff from the central unit up to district level and managing most of the help desk functions regarding technical issues of the system.

Through KNCV and KAPTLD, TB CARE I is the main partner working with DLTLTD to implement and manage TIBU. KNCV was responsible for providing input on the payment system development from processing to financial management and accountability towards auditors and USAID. KNCV also provided crucial support for improving data management quality to ensure TIBU is used to its maximum capacity.

The payment system comes into action once supervision or EQA activities are completed. TIBU indicates a need for payment to be made via mobile money transfer using M-pesa<sup>3</sup> to a TB or Lab Coordinator for any costs incurred during Supervision and EQA activities.

TB CARE I supported phase one and two of TIBU development. By the close out of TB CARE I in June, 2013 the payment system was fully functional and had been managed by KNCV since November 2012. The data management framework is finalized and functioning, all 2012 data has been transferred into the system and currently 2013 data are being entered. The system is able to generate cohort and case finding reports for 2012 and the first two quarters of 2013. During Phase Two, the supervision checklist used in the field was integrated into TIBU but will not be piloted in conjunction with the payment system until Phase Three, which will be managed under the follow-on mechanism to TB CARE I.

All 258 DTLCs and 24 PTLCs have been trained to use TIBU and equipped with tablets, of which TB CARE I procured 100. The remaining tablets were procured with support from Global Fund and CDC.

### **Lessons Learned**

1. While TB CARE I was successful in maintaining the DLTLTD supportive supervision system, it is considered a challenge that the current system is completely dependent on donor funding making it vulnerable to transitional periods and threats of diminishing donor support. It is recommended that DLTLTD explore options on how to best address sustainability issues.
2. Although the DLTLTD supervision system is running smoothly it is not supported by quality assurance measures (i.e. supervision) to know if it is really performing well. There is a need for DLTLTD to be better informed on how facilities and the TB program, in general, is benefiting—what is the value added of supervision? There also remain questions on the type of feedback provided

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<sup>3</sup> M-pesa is operated by Safaricom and is the first mobile money transfer system in the world. The Swahili word for money is "pesa".

and at what level. For example, while feedback is provided to DTLCs at quarterly review meetings, is it being provided at the facility level? Are issues being addressed and solved and how do we know this?

3. The TIBU project was designed to be implemented in phases which made it easier to roll out the system. Each phase had clear deliverables that had to be signed off by all the stakeholders (Operations, management and policy teams) before moving to the next phase. Before the system was developed, background information with focus on the users' requirements was collected. Through the development process, the users provided feedback which was helpful in improving the system. Since this was a learning process, continuous emphasis has been put on establishing an audit trail documenting each process including the problems encountered and how they were resolved.

## Monitoring & Evaluation, Surveillance and OR

The lead partner for this technical area was KNCV. TB CARE I provided full support for quarterly review meetings of DLTLD at all levels—district, provincial and national. A Data Management expert also supported DLTLD to develop and strengthen electronic surveillance system. The total investment over the project duration was \$1.5 million—12% of three year investment.

### Technical Outcomes

Expected Outcomes		Outcome Indicators	Indicator Definition	Baseline (2010)	Target Y2	Result Y2	Comments
7.1	Strengthened TB surveillance	An electronic recording and reporting system for routine surveillance exists at national and/or sub-national levels	Indicator Value: Yes/No	Yes	Yes	Yes	An electronic recording and reporting system exists for the national, provincial levels and 34% of districts (in 73 districts out of 215 districts).
		Diagnosed cases captured by routine surveillance system	Numerator: Number of cases in the routine surveillance system Denominator: Total number of cases in the routine surveillance system including laboratory and clinical diagnostic registers including the private sector.	Yes	Yes	Yes	97,922 (Please see attached Case finding report for 2012 generated from TIBU).
7.2	Improved OR plans and implementation	Proportion of prioritized research initiated	Numerator: Number of research initiated Denominator: Number of research prioritized	0	5/5	5/5	With support from TB CARE I, the DLTLD was provided with technical assistance for planning and implementation of five operation research studies

### Quarterly review meetings

Over the three years of operation, TB CARE I successfully supported all review meetings planned for District TB coordinators and Provincial (regional) TB Coordinators. A total of nine sets (three per year)

of quarterly review meetings for the DTLCs and five half-year (two per year) review meetings for the PTLCs were conducted. These meetings provided a good forum for DLTLDD officers and partners implementing TB activities in the country to share experiences, verify TB data, and address challenges to support better implementation of the TB program. A good example is that the meetings provided a forum for District TB Coordinators and provincial TB Coordinators to follow-up and confirm information for patients who transferred in or out to other districts/ provinces for further patients follow up. The forums were also very useful for information sharing regarding TB CARE I activities. During the review meetings, the TB CARE I M& E officers provided regular feedback on the TB CARE I work plan implementation. The TB CARE I staff were able to provide constructive feedback on supervision checklists that proved to be helpful as the quality of the supervision reports (in terms of timeliness, completeness, accuracy and consistency) from the districts and provinces were improved. Furthermore, staff were able to share experiences with each other as well as come up with solutions to problems encountered during a quarter, such as overcoming drug shortages by swapping stock amounts between districts.

### **Data Management**

With support from USAID (TB CAP and TB CARE I), DLTLDD was provided with technical assistance to develop a new surveillance system for tuberculosis. Kenya has introduced a patient/case based electronic surveillance system (TIBU) to improve data quality and the use of data for management purposes and operational research. The aim was to establish an efficient patient and internet based national TB surveillance in Kenya at all levels by the end of 2013.

DLTLDD was also supported to develop a data management Manual and SOPs, as well as staff trained on TB data management. Through TIBU, data is collected electronically and uploaded into the central database of DLTLDD. The data is immediately available for analysis and TIBU can generate cohort reports on case finding, treatment success, MDR incidence and mapping of specific TB issues. In addition, technical assistance was also provided to DLTLDD on planning and implementation of OR studies (mortality, prevalence Survey and KAP Survey).

### **Lessons Learned/Recommendations:**

1. Good data quality (facility & district) is crucial for an effective supervision system that provides the necessary input to measure performance and provide feedback for decision making.
2. Maintaining strong data quality management requires a systematic approach. This includes guidance with a Manual, Standard Operating Procedures (SOPs) and devoted Data Management staff—at least one full time position.

### **Drug supply and management**

The lead partner for this technical area was KNCV and the focus was on supporting DLTLDD to have adequate drug supplies at all levels. The total investment under this technical area was \$200,000—less than 1% of the total three year investment.

## Technical Outcomes

Expected Outcomes		Outcome Indicators	Indicator Definition	Baseline (2011)	Target	Result	Comments
					Y2	Y2	
8.1	Ensured nationwide systems for a sustainable supply of drugs	NTP request on TB commodity addressed	Assistance on reducing clearance delay and emergency drug distribution	0	10	7	Financial support for customs clearance was done for four shipments of drugs over the last two years.  In addition support was provided to distribute drugs to different regions within the country.

### Key Results

With support of TB CARE I, the national anti-TB drug supply chain was cushioned against drug clearance delays; TB CARE I also supported the emergency distribution of drugs, which greatly contributed to the uninterrupted supply of drugs.

## **Annex 1: Success story on Participation of TB advocates in TB control.**

### **TB Advocates Working in Nairobi's Kangemi Slum Contribute to the Fight against the Disease**

This is a story of a brave and dedicated young man—Stephen Anguva. The eldest of eight children raised by a single mother in the Kangemi slum area of Nairobi, Stephen worked as a water vendor to support his mother and siblings. In May 2009, Stephen started coughing, having chest pains, loss of appetite, and night sweats. He bought over-the-counter medicine, which provided only temporary relief. He lost a lot of weight, became very weak, and was not able to walk without support. His mother's friends said that Stephen's suffering was the result of witchcraft. The only way he could be cured was to use herbal medicine. He was given herbal medicine but his condition deteriorated further to where he could no longer walk or take care of himself. A young man living in the neighborhood, Stephen's friend, kept asking him to go to the health facility in Kangemi to get tested for tuberculosis (TB). One day in early July 2009, this friend insisted and took Stephen to Kangemi Health Center where he tested sputum smear-positive and was immediately started on treatment. He was instructed to go to the Health Center with his mother, who would be oriented to serve as his DOTS (Directly Observed Treatment) supporter. However, when she learned that

*"At first when I was diagnosed with TB, I was very scared. I did not take it easily."*

Stephen had TB, his mother refused to provide the support Stephen needed and sent him away. Fortunately, Stephen's friend welcomed him into his own home for the first two months of the intensive phase of treatment. A community health care worker provided Stephen with DOTS support.

*"My mother chased me from home saying I was a curse and a big embarrassment to the family," Stephen said.*

During this time, Stephen learned a lot about TB, including transmission, infection prevention, and TB management. Stephen's health greatly improved after about two months and he returned to his water vending job in the slum. A friend of Stephen's mother saw him working and told his mother that her son was back at his job. *"If you see Stephen now, you cannot believe it, he is so healthy,"* she told Stephen's mother. This was a big surprise for his mother because she had expected him to die. She looked for her son to confirm that he was indeed on his feet again. When Stephen met his mother, he understood she did not know anything about TB. So he educated her, telling her that TB is an airborne disease that is curable. He also said that she and his siblings needed to get tested. Stephen was then welcomed back home and stayed with the family while he continued to take his TB medication. He completed his treatment in early January 2010. Meanwhile, all of the family members were screened, with all testing negative.

*"TB anywhere is TB everywhere."*

With his experience before and after diagnosis, Stephen recognized that the lack of TB information in the community perpetuated a high level of stigma. In July 2009, Stephen and other TB patients came together to create the Pamoja TB Group, meaning "Together" in Swahili. Composed of current and former TB patients, Pamoja registered as a civil society organization in January 2010 and has since grown to a membership of 35 TB advocates under Stephen's leadership. It started as a support group: after collecting their medicine, TB patients would meet to share their experiences and encourage each other to continue with treatment.

With support from the US Agency for International Development through TB CARE I, the Kenya AIDS NGOs Consortium (KANCO) is working with TB advocates to increase demand for TB services at the community level. To date, TB CARE I has trained 176 TB advocates in five regions in collaboration with KANCO. The TB advocates are current and former TB patients who engage in community outreach activities to raise awareness about the disease. Pamoja started working with KANCO in January 2010. Its members are formally trained to be TB advocates, educated on such topics as: Advocacy, Communication and Social Mobilization (ACSM), defaulter tracing, contact tracing, multidrug-resistant TB, and The Patients' Charter for Tuberculosis Care, which outlines the rights and responsibilities of people with tuberculosis.

Stephen says that working as a TB advocate is a way of giving back to the community for the assistance he received. He has learned that "TB anywhere is TB everywhere." This is why there is such a great need to reach out to communities. With the other members of the Pamoja TB group, Stephen conducts outreach activities at church gatherings, schools, and alcohol drinking dens. In addition, he volunteers at the Kangemi Health Center assisting the nurses during TB clinic days, for example, weighing TB patients and counseling them. Stephen is also a DOT supporter for several TB patients who receive treatment from the Kangemi Health Center.

As a result of their activities, Stephen is proud to report that the level of stigma about TB in the community has gone down significantly. "We don't see discrimination of TB patients as used to be the case three years ago." For example, people now talk freely about TB in Kangemi and there is not so much fear in the community because people know that TB can be cured. For Stephen, seeing a patient journey from diagnosis to treatment to being cured is very inspiring and motivating.

Having shown so much enthusiasm and support for improving the health of community members in Kangemi, Stephen has become a community health worker under the Health Community Strategy being implemented by the Ministry of Health.

*"I am motivated when I see someone who was almost dead go through treatment and get cured".*

## **Annex 2: Success story on Laboratory Support**

### **Partnership among the National Tuberculosis Control Program, International Donors, and TB CARE I Improves the Quality of TB Diagnosis in Kenya**

*“We are very grateful for the support we received from USAID. We managed to increase the number of laboratories participating in the External Quality Assurance Program from about 260 to about 1,700. The focal point person (TB CARE I Laboratory Technical Officer) supported by USAID was very instrumental in this achievement.”*  
Head , National Tuberculosis Control Program Laboratory

The Division of Leprosy, Tuberculosis and Lung Disease (DLTLD) in Kenya relies on smear microscopy, also called “acid-fast bacilli” (AFB) testing, a low cost tool for the diagnosis of tuberculosis (TB). The main assets of AFB microscopy are its speed and extremely high specificity. However, a correct diagnosis and the timely initiation of treatment, if indicated, are highly dependent on technical factors, including: the quality of the sputum smear and staining; the quality and number of sputa; and the quality of the microscopic reading, including the instrument itself and lighting.

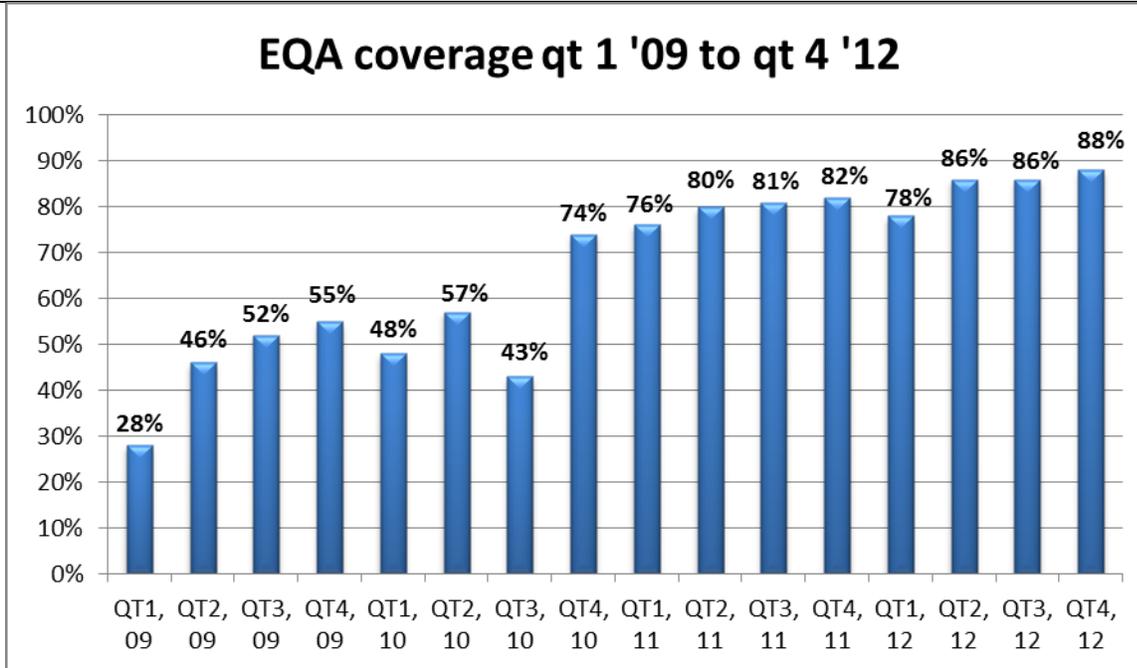
Effective TB control rests on an extensive network of laboratories at the local level that can provide accurate and reliable AFB microscopy testing. The availability and quality of AFB microscopy depends on a national TB program that supports, trains, and monitors the testing performance of the individual laboratories. This is known as External Quality Assurance (EQA).

EQA in Kenya is conducted through the blind rechecking of slides. As of the first quarter of 2009, only 28% of the public and private laboratories in the country were enrolled in the EQA program. As of the end of September 2012, quarterly EQA coverage had significantly increased to 88% (figure 1). The annual cumulative coverage stands at 93%, or just under 1,700 of the approximately 1,800 laboratories. The error rate (i.e., false positive or false negative TB diagnosis) for AFB microscopy testing dropped from 14% at the start of 2010 to 2.8% by September 2012 (figure 2), while the number of participating labs increased dramatically. In addition, the EQA program has seen an improvement in the rate of agreement between the labs’ test results and the results of rechecked slides, from 74% to 98% over the same period.

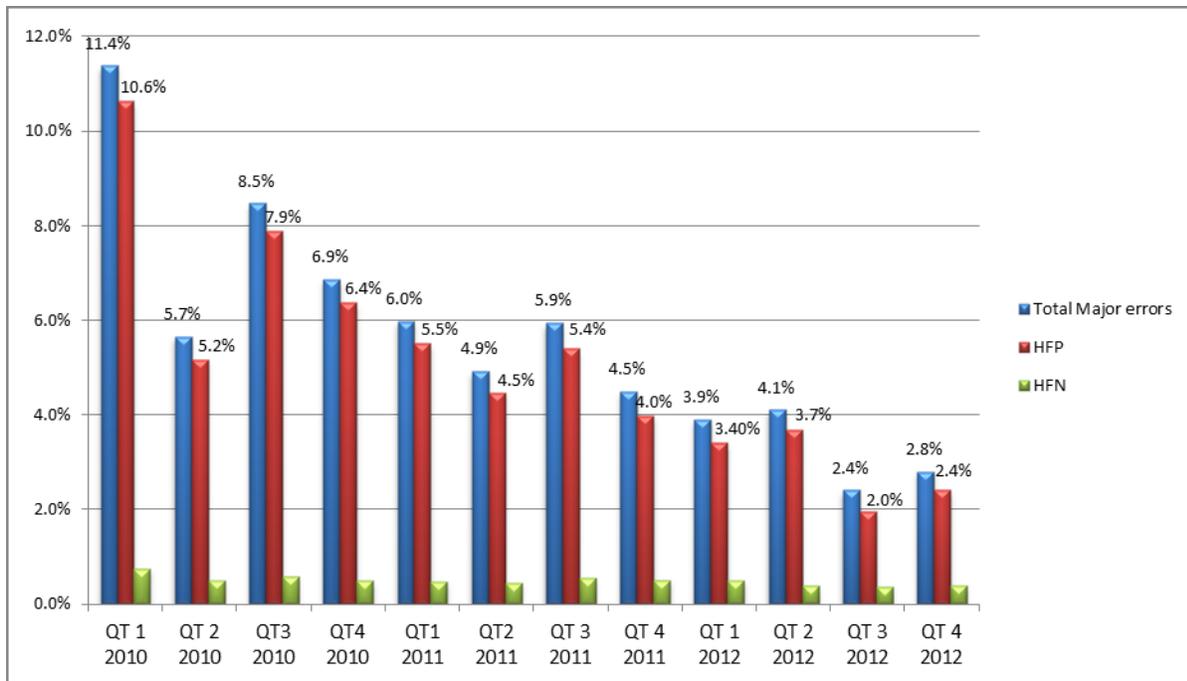
Owing to the significant drop in the number of incorrect diagnoses, individuals who test positive for TB are started on treatment in a timely fashion and healthy individuals are not subjected to unnecessary treatment. The improved performance of the labs has increased the confidence of health care workers in the diagnosis of tuberculosis.

*“I am very happy about the EQA process; it is one of the best programs I have implemented. With the training I have*

*received, I have a clear understanding of the quality of AFB microscopy and I am confident that the diagnosis is being done well. Slides are sampled randomly and rechecked; feedback is provided to the peripheral laboratories to improve the quality of the AFB microscopy.” – Zacharia Gatheru, Lab Technologist, Mathare North Health Centre*



**Figure 1. Coverage of the EQA Program, January 2009 to September 2012**



**Figure 2. AFB Microscopy Error Rate, January 2010 to September 2012**

HFP – High False Positives

HFN – High False Negatives

With support from TB CARE I, funded by the US Agency for International Development (USAID), and under a unique partnership with the Japanese International Cooperation Agency and the Global Fund to Fight AIDS, Tuberculosis and Malaria, the DLTLD established an EQA Centre at the Central Reference Laboratory in Nairobi, which is led by a team of three focal persons, called “The Three Musketeers”. The team provides support for EQA activities countrywide, including capacity building of laboratory personnel, data collection and analysis, report writing, and dissemination of EQA information for program improvement.

Moreover, through the TB CARE I project, USAID supported the development of EQA Guidelines, Standard Operating Procedures, and data collection and data analysis tools. These technical resources were used to train a total of 603 laboratory personnel and 172 supervisors on EQA program implementation. TB CARE I also supports laboratory personnel in the quarterly collection of slide samples for blind rechecking and the provision of feedback to the peripheral laboratories. Poorly performing laboratories are strengthened through on-site mentorship. This is a participatory process that includes laboratory health workers and their supervisors. All of these inputs and processes combined have greatly contributed to the sustained high level of both EQA coverage and the quality of smear microscopy diagnostic services.

*“Most of the time when I go to give EQA feedback, I am met by joyful laboratory technical officers who make comments like ‘I hope this time we have improved’ or ‘I hope we have maintained our quality.’ This means that EQA*

*has built their confidence in the results they give to clients and also motivates them to improve on their performance.” –*  
Joseph Karanja, Provincial Medical Laboratory Technologist for Nairobi North Region.