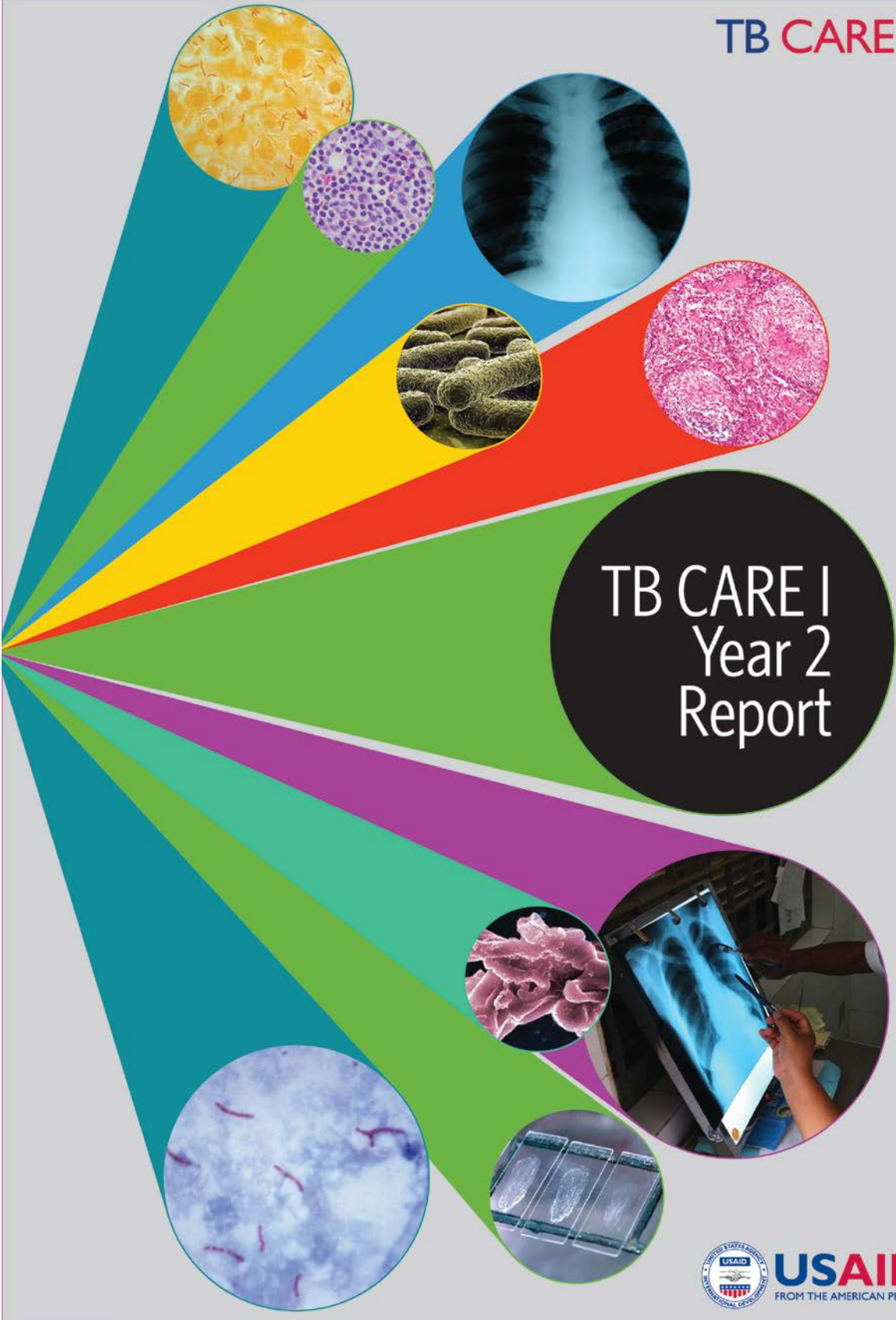


TB CARE I



TB CARE I
Year 2
Report



USAID
FROM THE AMERICAN PEOPLE



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TB CARE I

Year 2

Annual Report

October 1, 2011 – September 30, 2012

November 15, 2012

TB CARE I Partners

American Thoracic Society (ATS)

FHI 360

Japan Anti-Tuberculosis Association (JATA)

KNCV Tuberculosis Foundation (KNCV)

Management Sciences for Health (MSH)

International Union Against Tuberculosis and Lung Disease (The Union)

World Health Organization (WHO)

Cover page: The front cover shows images of TB bacterium and chest X-rays of patients suspected of having TB.

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List of Abbreviations

ACSM	Advocacy Communication Social Mobilization
AFB	Acid Fast Bacilli
ART	Antiretroviral therapy
CAR	Central Asian Republics
CATA	Cambodia Anti-TB Association
CCM	Country Coordinating Mechanism
CDC	Center for Disease Control and Prevention
CENAT	National Center for Tuberculosis and Leprosy Control
CoE	Center of Excellence
CDR	Case Detection Rate
CPT	Cotrimoxazole preventive therapy
CSO	Civil Society Organization
DOT	Directly Observed Treatment
DOTS	Directly Observed Treatment Short Course
DR	Drug Resistance
DRS	Drug Resistance Survey
DST	Drug Susceptibility Testing
ECSA	East, Central and Southern Africa
EOA	External Quality Assurance
ERR	Electronic Recording & Reporting
FIND	Foundation for Innovative New Diagnostics
FLD	First Line Drug
GDF	Global Drug Facility
GFATM	Global Fund for Aids, Tuberculosis and Malaria
GLC	Green Light Committee
GLI	Global Laboratory Initiative
GSN	Gold Star Network
HBC	High Burden Country
HR	Human Resources
HSS	Health System Strengthening
IC	Infection Control
ICT	Information, communication and technology
IEC	Information, Education and Communication
ILEP	International Federation of Anti-Leprosy Associations
IPC	Infection Prevention and Control
InSTEDD	Innovative Support to Emergencies Diseases and Disasters
JATA	Japan Anti Tuberculosis Association
KANCO	Kenya AIDS NGOs Consortium
KAPTLD	Kenya Association for the Prevention of TB and Lung Diseases
KIT	Royal Tropical Institute
KNCV	KNCV Tuberculosis Foundation
MDR	Multi Drug Resistance
MDR-TB	Multi Drug Resistant Tuberculosis
M&E	Monitoring and Evaluation
MOA	Memorandum of Agreement
MOH	Ministry of Health
MOST	Management & Organizational Sustainability Tool
MSF	Médecins sans Frontières (Doctors without Borders)
MSH	Management Sciences for Health
NAP	National AIDS Program
NGO	Non Governmental Organization
NIHE	National Institute of Health and Epidemics (Vietnam)

NTP	National TB Program
NRL	National Reference Laboratory
NTRL	National Tuberculosis Reference Laboratory (Uganda)
OD	Operational District
OR	Operations Research
PCA	Patient-Centered Approach
PMDT	Programmatic Management of Drug-resistant Tuberculosis
PMU	Program Management Unit
PPM	Private Public Mix
PPP	Public Private Partnership
RIF	Rifampacin
QMR	Quarterly Monitoring Report
SLD	Second Line Drug
SRL	Supra-national Reference Laboratory
SRLN	Supra-national Reference Laboratory Network
SOP	Standard Operating Procedures
SS+	Sputum Smear positive
SS-	Sputum Smear negative
STAR	Situation, Task, Action, Result
TA	Technical Assistance
TB	Tuberculosis
TB CAP	Tuberculosis Control Assistance Program
TBCTA	Tuberculosis Coalition for Technical Assistance
TB-IC	Tuberculosis Infection Control
TWG	Technical Working Group
USAID	United States Agency for International Development
USG	United States Government
WHO	World Health Organization
XDR-TB	Extensively Drug-Resistant Tuberculosis

Executive Summary

Two years into a five-year cooperative agreement with USAID, TB CARE I has achieved important results. This report provides a summary of the program's contributions towards USAID's targets and expected outcomes, as well as results achieved to date through 42 new core projects, four regional projects and 22 country projects.

TB CARE I contributes to three USAID target areas:

- Sustain or exceed 84% case detection rate and 87% treatment success rate
- Treat successfully 2.55 million new sputum-positive TB cases
- Diagnose and treat 57,200 new cases of multi-drug resistant TB (MDR-TB)

Below is a summary of data for the five core TB CARE I indicators that are used to measure TB CARE I's contribution to these targets:

1) Number of cases notified (all forms and smear-positive cases) - In 2011, over 1 million TB cases (all forms) and 515,647 new confirmed cases of TB were reported to WHO across all TB CARE I countries. This demonstrates a 4.3% increase in new confirmed cases from the previous year (21,409 more cases). Fifty-eight percent of new patients were among men in 2011.

2) Case detection rate (all forms) - While Kazakhstan is the only country to have exceeded the 84% USAID target at 87% in 2011, 12 countries have CDRs that have improved since 2010 and eight are currently above the 70% STOP TB CDR target.

3) Treatment Success Rate (TSR) of confirmed patients – Compared to 2009, 45,072 more patients were cured or completed treatment in 2010, representing an 11% increase. The treatment of 460,751 sputum smear positive (SS+) patients in 2010 translates to 18% achievement of the 2014 USAID target (2.55 million over five years). Five countries exceed the USAID TSR target of 87% with Afghanistan and Kenya reaching or surpassing the target in 2010. Nine countries have met the STOP TB target of 85% TSR and seven countries have TSRs that improved from 2009.

4) Number (and percent) of confirmed TB cases among Health Care Workers (HCWs) - The systematic reporting of healthcare workers (HCWs) with TB continues to be a challenge in most TB CARE I countries. Only 391 cases across all TB CARE I countries were reported to WHO in 2011. Only Kazakhstan, Kyrgyzstan and Vietnam (2012) have reporting systems in place to consistently capture these data.

5) Number of new MDR cases diagnosed and put on treatment - An 18% increase in diagnosis of MDR-TB cases was seen from 2010 to 2011 (12,575 total in 2011). Every TB CARE I country reported more MDR cases in 2011 than in 2010 with the exception of Botswana, Namibia and Uganda. Although 8% more MDR-TB patients were put on treatment in 2011 (8,911) compared to 2010 (8,262), this is not keeping pace with the increase in case detection or the backlog of MDR-TB patients that were previously diagnosed. The cumulative number of MDR-TB patients started on treatment between 2010 and 2011 (17,173) equates to 30% of the USAID target (57,200 patients by 2014) being achieved. The recording and reporting system (R&R) for MDR-TB is often only as good as the R&R system for drug-sensitive TB cases however.

The table below provides a summary of TB CARE performance indicators.

Table 1: Summary of TB CARE I performance indicator results

Summary Indicator Results	2010	2011	2012*
Number of cases notified (all forms)	1,112,695	1,133,632	N/A
Number of cases notified (new confirmed)	494,238	515,647	N/A
Percent of male (new confirmed) TB cases	56.0%	58.0%	N/A
Number SS+ successfully treated	415,679	460,751	N/A
Number of confirmed TB cases among HCWs	347	391	N/A
Number of MDR cases diagnosed	10,622	12,575	N/A
Number of MDR-TB patients who started treatment for MDR-TB	8,262	8,911	N/A
Number of TB patients diagnosed by private provider	27,725	38,842	N/A
Number of TB cases (all forms) diagnosed in children	49,281	53,717	N/A
Number of prisons providing DOTS*	139	154	736
Number of facilities where quality of services is measured*	U	U	26
Number of facilities where cost to patients is measured*	U	U	25
Number of operational Xpert instruments (TB CARE I)*	U	U	48
Number of Xpert tests conducted (TB CARE I)*	U	U	8,523
Number Xpert MTB positive (TB CARE I)*	U	U	3,566
# Xpert MTB Rif resistant (TB CARE I)*	U	U	967
Number of facilities where TB-IC has been supported by TB	U	74	662
Percent of retreatment TB cases tested for MDR TB	10.8%	11.6%	N/A
Number enrolled in HIV care who had their TB status assessed and recorded during their last visit	693,146	973,695	N/A
Percent of TB patients with an HIV test result recorded in the TB register	50%	51%	N/A
Percent HIV-positive TB patients started or continued on ART	39%	49%	N/A
Percent HIV-positive TB patients started or continued on CPT	85%	80%	N/A
Number of TB CARE-supported supervisory visits conducted*	N/A	U	23,336
People trained using TB CARE funds*	N/A	4,354	12,000
Use of trained consultants*	N/A	0	22
Number of completed TB CARE-supported OR studies (disseminated)*	N/A	U	8 (4)
Number of TB CARE I Countries	Baseline	Year 1	Year 2
PPM strategy developed and/or implemented	U	U	11
Childhood TB approach piloted and/or implemented	U	U	13
CB-DOTS program is implemented	8	9	13
A national laboratory strategic plan developed and implemented	5	7	15
Confirmed link with an SRL	11	11	19
Technical assistance visits from an SRL conducted	U	U	16
Investment in Xpert implementation	3	13	14
Approved national TB IC guidelines	10	13	14
TB-IC is included in the national Infection Prevention Control (IPC) policy	7	7	14
National surveillance system monitors TB among HCWs	2	2	3
A functioning National PMDT coordinating body	U	U	19
CCM and/or other coordinating mechanisms include TB civil society members and TB patient groups	15	15	16
An electronic recording and reporting system for routine surveillance exists at national and/or sub-national levels	8	8	12
Data quality measured by NTP	9	10	15
NTP provides regular feedback from central to intermediate level	7	7	18
National forecast for the next calendar year is available	U	U	20
Updated SOPs for selection, quantification, procurement, and management of TB medicines available	8	8	14

* Refers to FY2012 (October 2011-September 2012)

**N/A – Not applicable; U - Unknown

Key achievements from each TB CARE I technical area have been highlighted below:

Universal and early access – The patient-centered approach (PCA) is being applied in many TB CARE I countries. As a result of applying the various PCA tools in Year 2, quality of services is being measured in five countries, cost to patients has been/is being evaluated in six countries and the Patient's Charter is being implemented in four countries. In Ethiopia, TB patients spent on average 26% of their median individual annual income (\$272.20) on direct and indirect costs related to their care.

Laboratories - As of the end of Year 2, 67 GeneXpert instruments have been procured across 11 TB CARE I countries; implementation of 48 instruments (72%) has successfully begun, so far performing 8,523 tests. From those tested, 42% were MTB positive of which 27% were MTB RIF resistant. TB CARE I's contribution represents 36% of the total operational numbers of GeneXpert instruments in these 11 countries. The program also supported countries through two regional Xpert workshops with participation from 13 countries.

IC –TB CARE launched a demonstration project introducing an array of interventions in 15 healthcare facilities in Ndola district, Zambia to improve TB-IC. In nine months, compliance with TB-IC practices rose from 27% to 58% using a CDC standard monitoring tool. By the end of the demonstration project in September 2013 the target is to achieve 80% compliance.

PMDT – From 2010 to 2011, the proportion of diagnosed MDR-TB cases in TB CARE I countries other than Kazakhstan substantially increased from 3,235 to 5,167 (in 2010, 70% of all diagnosed MDR-TB patients in TB CARE I countries were from Kazakhstan, while in 2011 this reduced to 59%). In addition, in April 2012, the program organized and facilitated a regional workshop, "Programmatic Management to Strengthen M/XDR-TB Control in Central Asia," with participation from the NTPs and the main partners in Kazakhstan, Kyrgyzstan, Uzbekistan, Tajikistan and Turkmenistan. Each country began developing a national response to the Consolidated Action Plan to Prevent and Combat M/XDR-TB in the WHO European Region.

TB/HIV - The average percentage of co-infected patients on ART rose from 37% to 49% (85% to 80% for CPT). In TB CARE I-supported areas in Nigeria, ART use improved from 39% in Year 1 to 55% in Year 2, while CPT use increased from 48% to 70% over the same time period.

Health Systems Strengthening – TB CARE I trained 12,000 (50% female) in Year 2 across all technical areas at the country level, which is almost one thousand more than what was planned (11,063). At the global level, of the 12 TB-IC consultants that were trained in the first year, 22 international consultancies have been conducted.

In Indonesia, an official financial sustainability strategy was published in Year 2 with technical support from the project. The economic burden of TB was also analyzed from a providers' perspective to advocate local governments and insurance companies in Indonesia to increase their funding for TB.

M&E, OR and surveillance – TB CARE I countries are showing improvement in regards to measuring data quality and providing regular feedback. In Year 2, 71% of countries reported measuring some aspect of data quality compared to only 55% of countries in Year 1 and 50% at baseline.

The Pakistan TB prevalence survey was completed and preliminary results were presented. The prevalence of definite pulmonary TB cases in Pakistan is 295/100,000 adult population, which is lower than the 350/100,000 (158-618) indirect estimate (*WHO report 2012*), but is still within the 95% confidence interval. The fieldwork for the Ethiopia prevalence survey was also completed with the support of TB CARE I. The prevalence of smear positive TB among the total Ethiopian population was estimated to be 61/100,000 (95% CI: 44-81), which is three times lower than the 2008 indirect estimate (284/100,000).

Drug supply and management – Compared to baseline and Year 1 (8 countries), drug management SOPs are now available in 14 TB CARE I countries, including two countries where TB CARE I assisted in the development/update of the document (Indonesia and Mozambique). In Indonesia, TB CARE I supported the NTP to develop standard operating procedures to address Global Fund-mandated TB quality assurance processes at the Port of Entry.

1. Introduction

TB CARE I is a USAID five-year cooperative agreement (2010-2015) that builds and expands upon previous USAID TB prevention and treatment efforts over the last eleven years, particularly the success of the Tuberculosis Control Assistance Program (TB CAP). TB CARE I is one of the main global mechanisms for implementing USAID's TB strategy as well as contributing to TB/HIV activities under the U.S. President's Emergency Plan for AIDS Relief (PEPFAR). TB CARE I follows on from the Tuberculosis Coalition for Technical Assistance program (TBCTA, 2000-2005) and TB CAP (2005-2010) and it is implemented by a coalition of seven international organizations in TB control. KNCV Tuberculosis Foundation (KNCV) is the prime partner and the collaborating partners are American Thoracic Society (ATS), FHI 360, International Union Against Tuberculosis and Lung Disease (The Union), Japan Anti-Tuberculosis Association (JATA), Management Sciences for Health (MSH) and World Health Organization (WHO).

There is a second program, TB CARE II, which shares the same objectives, technical strategies and indicators as TB CARE I. TB CARE II is led by University Research Co., LCC (URC) and collaborating partners include Partners in Health (PIH), JHPIEGO and Project HOPE. TB CARE I and II share a strategic board and collaborate on a few strategic core projects.

The TB CARE program focuses on eight priority Technical Areas:

1. Universal and Early Access
2. Laboratories
3. Infection Control (IC)
4. Programmatic Management of Drug Resistant TB (PMDT)
5. TB/HIV
6. Health Systems Strengthening
7. Monitoring & Evaluation (M&E), Operations Research (OR) and Surveillance
8. Drug Supply and Management

and four over-arching elements, representing the 'CARE' of TB CARE:

- **C**ollaboration and Coordination
- **A**ccess to TB services for all people
- **R**esponsible and Responsive Management Practices;
- **E**vidence-based M&E

TB CARE's strategy is based on four components: 1) building on foundations to achieve new levels of success; 2) using innovations to respond to USAID Missions and country needs; 3) strengthening partnerships to achieve universal access and improve outcomes; and 4) strengthening health systems to ensure sustainability. More information on the program can be found at www.tbcare1.org.

The TB CARE I coalition is pleased to present USAID with the Year 2 Annual Report of the TB CARE I program. In Year 2 (October 2011-September 2012), four regional projects, 42 new core projects and 22 country projects were implemented, which included three new countries: Tajikistan, Uganda and Uzbekistan, while Pakistan closed out during Year 2. This report summarizes the program's contributions through these projects towards USAID's targets and expected outcomes, as well as the results achieved to date by technical area. Whenever possible, country-level data were extracted from the *WHO Global TB Report 2012*; otherwise national data were collected by TB CARE I from NTPs or the appropriate data source (i.e. NAP, prison system). Additional details on country achievements and country-specific indicators can be found in the country-specific Annual Reports; the July-September 2012 Quarterly Monitoring Report summarizes the status of all on-going core projects.

2. Background

The Global Context

TB continues to be a significant public health issue worldwide. Although the absolute number of TB patients has been declining since 2006, in 2011, there were still roughly 8.7 million persons being diagnosed with TB, of whom 1.1 million (13%) were co-infected with HIV, and 0.5 million were children. Roughly 1.4 million persons died from TB, of which 0.4 million was from HIV-associated TB. Tuberculosis is still one of the top killers of women with 0.5 million deaths in 2011; 200,000 of these deaths were among women who were HIV co-infected. An estimated 64,000 children died from TB in 2011.¹

Globally, in 2011, 5.8 million new and recurrent patients with TB were notified, which is equivalent to 66% of the estimated number of 8.7 million patients falling ill with TB that year. The treatment success rate among new confirmed patients was 87% at the global level.

The world is on track to achieve the 2015 Millennium Development Goal (MDG) targets for reduction in incidence and mortality, except for Africa and Europe which are not on track to meet the 50% mortality reduction target.

MDR-TB continues to be a major concern although progress is being made on some fronts. During 2011 only 19% of the estimated 310,000 patients who developed MDR-TB were diagnosed, still low, but also a doubling compared to 2010. Almost 60% of these patients lived in China, India and the Russian Federation. Extensively drug resistant TB (XDR-TB) has now been identified in 84 countries; the average proportion of XDR-TB among all MDR-TB patients is 9%. The target of 75% treatment success was only reached in 30 of 107 countries reporting this information. Much more work still needs to be done to reach the missing 81% and increase the treatment outcomes. There are now data on TB transmission due to untreated MDR and XDR patients.

The roll-out of the Xpert MTB/RIF rapid molecular test continued since its endorsement by WHO in December 2010, and by June 2012 was introduced in 67 of 145 countries eligible to buy the machine and cartridges at concessional prices. This rapid test – results are available within 2 hours - has the potential to increase diagnosis of TB and MDR-TB, particularly at an earlier stage, despite the test itself being still too complicated to be considered a point-of-care test. It needs a strong laboratory system with constant electricity, and quality culture; drug sensitivity testing is also still required for good management of drug-resistant tuberculosis, although many countries do not have these services.

With about 13% of TB patients occurring among people living with HIV (PLHIV), TB/HIV collaborative interventions are still important. Good progress was made in the past year. Progress in the African countries was significant: 69% of TB patients knew their HIV status, up from 59% in 2010; and 40% globally up from 33% in 2010. Globally, 79% of HIV-positive TB patients were receiving cotrimoxazole preventative therapy (CPT) and 48% were receiving antiretroviral therapy (ART) – a small increase from 46% on ART in 2010. Efforts need to be sustained and expanded in order to reach the global targets of every TB patient being tested for HIV and for every co-infected patient to receive CPT and ARV.

USAID's Response

In 2008, the U.S. Congress passed the Tom Lantos and Henry J. Hyde United States Global Leadership Against HIV/AIDS, Tuberculosis and Malaria Reauthorization Act, which supported a substantial increase in U.S. Government (USG) funding for TB treatment and control over a five-year period. A USG Global Tuberculosis Strategy was developed, which supported the objectives of the Global Plan to STOP TB. The USG strategy for 2009-2014 contains four main goals and targets:

1. Contributing to a 50 percent reduction in TB deaths and disease burden from the 1990 baseline;
2. Sustaining or exceeding the detection of at least 84 percent of sputum smear-positive cases of TB and successfully treating at least 87 percent of cases detected in countries with established USG tuberculosis programs;

¹ World Health Organization. (2012). Global Tuberculosis Report 2012. Geneva: World Health Organization. Retrieved from http://www.who.int/tb/publications/global_report/en/index.html

3. Successfully treating 2.6 million new sputum smear-positive TB patients under DOTS programs by 2014, primarily through support for needed services, commodities, health workers, and training, and additional treatment through coordinated multilateral efforts; and
4. Diagnosing and initiating treatment of at least 57,200 new MDR-TB cases by 2014 and providing additional treatment through coordinated multilateral efforts.

The following key interventions were selected to achieve these targets:

1. Accelerated detection and treatment of TB in up to 25 countries;
2. Scaled up prevention and treatment of MDR-TB;
3. Expanded coverage of interventions for TB-HIV co-infection in coordination with USG HIV efforts under the President's Emergency Plan for AIDS Relief (PEPFAR); and
4. Improvements in health systems.

TB CARE I and TB CARE II were designed to implement the USG strategy and contribute to the overall USG TB control targets. TB CARE collaborates with other national and international initiatives in providing global leadership and support to National TB control efforts.

3. TB CARE I's Contribution to USAID Targets

USAID's goal is to halve TB prevalence and death rates in USAID assisted countries by 2015 (relative to the 1990 baseline) and is consistent with the Global Plan to STOP TB. As mentioned above, three key targets have been identified for achieving this goal:

- Sustain or exceed 84% case detection rate and 87% treatment success rate of those cases in countries with established USAID TB programs;
- Treat successfully 2,550,000 new smear-positive TB cases;
- Diagnose and initiate treatment for 57,200 new cases of MDR-TB.

TB CARE I's contribution to these targets is measured through the following core indicators at the national level as reported in the annual WHO Global TB Report:

1. Number of cases notified (all forms and new confirmed)
2. Case detection rate
3. Treatment success rate
4. Number (and percent) of confirmed TB cases among healthcare workers (HCWs)
5. Number of MDR cases diagnosed and put on treatment

TB CARE I is assisting NTPs to improve the prevention and control of TB from a country perspective; in addition to in-country resources (government funding, etc.), countries are often also assisted through other means like the Global Fund (GF). Therefore it is difficult to measure to what extent changes in these indicators are attributable only to TB CARE I interventions. In some countries TB CARE I operates on a selected range of technical areas and the geographic area is not always country-wide. The technical area indicators (see Section 4) can help to tease out TB CARE I's impact in specific areas.

Number of cases notified (all forms and new confirmed)

In 2011, over 1 million TB cases (all forms) and 515,647 new bacteriologically confirmed cases of TB were reported to WHO across all TB CARE I countries (Table 2). This demonstrates a 4.3% increase in new confirmed cases from the previous year (21,409 more cases). Indonesia continues to diagnose the greatest number of cases (321,308 all forms) while Djibouti switched places with Dominican Republic for the fewest diagnosed (3,723 all forms). In 2011, 58% of newly diagnosed patients were male, with Afghanistan reporting the lowest percentage male (34%) and Vietnam the highest (75%). Gender disaggregation continues to be missing in Mozambique, while South Sudan officially began reporting to WHO as an independent state this year.

Table 2: Number of cases notified (all forms and new confirmed) and percent male of new confirmed cases (WHO, 2012)

TB CARE I Country	2010			2011		
	All forms	New confirmed	% male (new confirmed)	All forms	New confirmed	% male (new confirmed)
Afghanistan	28,238	12,947	33%	28,167	13,789	34%
Botswana	7,632	3,295	56%	6,733	2,669	56%
Cambodia	41,628	17,454	54%	39,670	15,812	54%
Djibouti	4,191	1,181	65%	3,723	1,336	63%
Dom. Rep.	4,160	2,159	61%	4,472	2,454	62%
Ethiopia	156,928	46,634	56%	159,017	49,594	56%
Ghana	15,145	7,656	67%	15,840	7,616	65%
Indonesia	302,861	183,366	60%	321,308	197,797	59%
Kazakhstan	24,854	4,769	61%	23,076	4,306	62%
Kenya	106,083	36,260	61%	103,981	37,085	62%
Kyrgyzstan	6,295	1,645	59%	6,254	1,537	59%
Mozambique	46,174	20,097	0%	47,452	19,537	
Namibia	12,625	4,464	56%	11,938	4,503	56%
Nigeria	90,447	45,416	61%	93,050	47,436	61%
South Sudan				7,583	2,797	62%
Tajikistan	6,944	2,290	56%	6,864	2,174	54%
Uganda	45,546	23,456	64%	49,018	25,614	64%
Uzbekistan	20,330	4,711	57%	15,069	4,198	56%
Vietnam	96,441	52,145	74%	100,518	50,751	75%
Zambia	48,616	12,639	0%	48,594	12,046	62%
Zimbabwe	47,557	11,654	52%	41,305	12,596	55%
Grand Total	1,112,695	494,238	56% (total #: 277,946)	1,133,632	515,647	58% (total #: 299,473)

Case Detection Rate (CDR)

Table 3 below shows a slight improvement in CDR across TB CARE I countries. While Kazakhstan is the only country to have exceeded the 84% USAID target at 87%, 12 countries have CDRs that have improved since 2010 and eight are currently above the 70% STOP TB CDR target. Six countries have a CDR lower than 50% with Mozambique having the lowest at 34% in 2011.

Table 3: Case detection rate, all forms (WHO 2012)

TB CARE I Country	2010 (%)	2011 (%)
Afghanistan	47	46
Botswana	70	71
Cambodia	65	64
Djibouti	76	66
Dominican Republic	59	66
Ethiopia	69	72
Ghana	70	78
Indonesia	66	70
Kazakhstan	83	87
Kenya	82	81
Kyrgyzstan	76	80
Mozambique	34	34
Namibia	57	64
Nigeria	40	45
South Sudan		48
Tajikistan	48	47
Uganda	61	69
Uzbekistan	50	52
Vietnam	54	56
Zambia	73	73
Zimbabwe	56	50

WHO annually reviews the calculation of CDR for each country. As a result CDR for countries over the past 10 years may be readjusted downward. For example, Namibia was reported with a CDR of 82% in the *WHO Global TB Report 2011*, and in the 2012 report CDR was adjusted downward to 57% in 2010, and 64% in 2011.

Successfully treated new confirmed TB cases and Treatment Success Rate (TSR)

Progress is being made in the successful treatment of new confirmed cases of TB (i.e. SS+). Compared to 2009, 45,072 more patients were cured or completed treatment in 2010, representing an 11% increase (see Table 4). The treatment of 460,751 SS+ patients in 2010 translates to 18% achievement of the 2014 USAID target (2.55 million over five years). Cambodia has the highest TSR at 94% and Kazakhstan only successfully treated 61% of their 2010 cohort. Five countries exceed the USAID target of 87% with Afghanistan and Kenya reaching or surpassing the target in 2010. Nine countries have met the STOP TB target of 85% TSR and seven countries have TSRs that improved from 2009.

Table 4: Treatment Success Rate and successful treatment* of sputum smear positive TB cases, 2009-2010 (WHO 2012)

TB CARE I Country	2009		2010	
	# SS+ Successfully Treated	TSR (SS+) %	# SS+ Successfully Treated	TSR (SS+) %
Afghanistan	10,806	86	11,621	90
Botswana	2,772	79	2,698	81
Cambodia	16,974	95	16,389	94
Djibouti	1,007	79	938	80
Dominican Republic	2,082	85	1,755	80
Ethiopia	37,680	84	38,484	83
Ghana	7,178	87	6,549	86
Indonesia	154,294	91	165,564	90
Kazakhstan	3,341	62	2,995	61
Kenya	32,112	86	31,606	87
Kyrgyzstan	1,272	82	0	
Mozambique	16,647	85	17,075	85
Namibia	4,010	85	3,859	85
Nigeria	37,048	83	37,978	84
South Sudan			1,588	75
Tajikistan	1,604	81	1,834	80
Uganda	15,556	67	16,673	71
Uzbekistan	4,037	81	3,819	81
Vietnam	47,500	92	48,149	92
Zambia	11,760	90	41,684	86
Zimbabwe	7,999	78	9,493	81
Grand Total	415,679		460,751	

*Successfully treated includes both SS+ cases that have been cured and those that have completed treatment

Table 5 below summarizes TB CARE I progress towards achieving both 84% CDR and 87% TSR. Kazakhstan and Kenya surpassed the CDR and TSR targets respectively in 2010, while Ghana dipped slightly below the TSR target (at 86%). Considerable progress is still needed to achieve the ambitious targets of USAID, but in general, TB CARE I countries are moving in the right direction.

Table 5: TB CARE I countries progress towards reaching USAID CDR and TSR targets (WHO, 2012)

(Source: WHO Global TB Report 2012)		87% Treatment Success Rate (Confirmed cases, 2010)	
		Reached	Not reached
84% Case Detection Rate (All forms, 2011)	Reached	0%	5% Kazakhstan
	Not reached	24% Afghanistan, Cambodia, Indonesia, Kenya , Vietnam	71% Botswana, Dominican Republic, Djibouti, Ethiopia, Ghana , Kyrgyzstan, Mozambique, Namibia, Nigeria, South Sudan, Tajikistan, Uganda, Uzbekistan, Zambia, Zimbabwe

Number (and percent) of confirmed TB cases among HCWs

The systematic reporting of healthcare workers (HCWs) with TB continues to be a challenge in most TB CARE I countries. Table 6 illustrates that only a few countries have reported HCW TB cases in 2010 and 2011, and of these countries only Kazakhstan and Kyrgyzstan have reporting systems in place to consistently capture these data. Vietnam established a sentinel surveillance system of 63 hospitals in 2012 so data are expected next year. TB CARE I is working in several countries to help NTPs to prevent, diagnose and collect data on TB among healthcare workers; this progress will hopefully start to be seen in 2013.

Table 6: Number and percent of confirmed TB cases among healthcare workers, 2010-2011 (WHO 2012)

TB CARE I Country	2010		2011	
	# of HCWs reported w/ TB	% of HCWs reported with TB	# of HCWs reported w/ TB	% of HCWs reported with TB
Afghanistan				
Botswana				
Cambodia				
Djibouti				
Dominican Republic	12	0.03%	0	
Ethiopia				
Ghana	0		11	
Indonesia				
Kazakhstan	139	2.04%		
Kenya	36	0.03%	134	0.12%
Kyrgyzstan			42	
Mozambique	19	0.06%		
Namibia	3	0.06%		
Nigeria				
South Sudan				
Tajikistan			24	0.04%
Uganda				
Uzbekistan	138	0.04%	180	0.05%
Vietnam				
Zambia				
Zimbabwe				
Grand Total	347		391	

Number of MDR cases diagnosed and put on treatment

In TB CARE I countries, an 18% increase in diagnosis of MDR-TB cases was seen from 2010 to 2011 (see Table 7). Every TB CARE I country reported more MDR cases in 2011 than in 2010 with the exception of Botswana, Namibia and Uganda. Acceleration of MDR-TB diagnosis is necessary and expected in the coming years as several countries are scaling up PMDT and using GeneXpert to help detect more drug resistant cases.

Table 7: Number of MDR cases diagnosed among new and retreatment patients, 2010-2011 (WHO 2012)

Patients with unknown treatment history are included in the 'Total MDR' column.

TB CARE I Country	2010			2011		
	New	Retreatment	Total MDR	New	Retreatment	Total MDR
Afghanistan	13	6	19			19
Botswana	45	51	106	9	17	46
Cambodia	1	30	31	0	56	56
Djibouti						0
Dom. Rep.	25	83	108	12	77	117
Ethiopia	19	121	140	35	85	212
Ghana		4	4	0	7	7
Indonesia	0	182	182	3	380	383
Kazakhstan	1,408	2,099	7,387	1,604	2,456	7,408
Kenya		103	112	17	149	166
Kyrgyzstan	225	264	566	451	232	806
Mozambique	18	130	165	76	202	283
Namibia	19	193	214			192
Nigeria	8	11	21	6	56	95
South Sudan					6	6
Tajikistan	92	174	333	72	308	604
Uganda	15	37	93	7	43	71
Uzbekistan	430	593	1,023	170	89	1,385
Vietnam			101			601
Zambia						
Zimbabwe			17	0	0	118
Grand Total	2,318	4,081	10,622	2,462	4,163	12,575

Slow progress was also seen with MDR-TB patients put on treatment (Table 8). Although 8% (649) more MDR-TB patients were put on treatment in 2011 compared to 2010, this is not keeping pace with the increase in case detection or the backlog of MDR-TB patients that were previously diagnosed (see PMDT section for more information). The cumulative number of MDR-TB patients started on treatment between 2010 and 2011 (17,173) equates to 30% of the USAID target (57,200 patients by 2014) being achieved. The recording and reporting system (R&R) for MDR-TB is often only as good as the R&R system for drug-sensitive TB cases however. There are (anecdotal) indications that some countries suffer from under-reporting, further reinforcing the need for stronger R&R systems for both TB and MDR-TB.

Table 8: Number of unconfirmed and confirmed MDR-TB patients who started treatment for MDR-TB, 2010-2011 (WHO 2012)

TB CARE I Country	2010	2011	Grand Total
Afghanistan	0	21	21
Botswana	114	46	160
Cambodia	38	57	95
Djibouti	7	0	7
Dominican Republic	114	107	221
Ethiopia	120	199	319
Ghana	3	2	5
Indonesia	142	260	402
Kazakhstan	5,705	5,261	10,966
Kenya	118	156	274
Kyrgyzstan	566	492	1,058
Mozambique	87	146	233
Namibia	214	242	456
Nigeria	23	38	61
South Sudan		0	0
Tajikistan	245	380	625
Uganda	10	7	17
Uzbekistan	628	855	1,483
Vietnam	101	578	679
Zambia	0	0	0
Zimbabwe	27	64	91
Grand Total	8,262	8,911	17,173

4. TB CARE I Technical Areas

As of the end of Year 2, TB CARE I implements projects in 21 countries (Pakistan ended during Year 2 and Senegal has not yet begun). This diversity of countries (Figure 1) provides significant reach across continents to help NTPs improve TB control. In total, there are more than 840 million people living in the countries where TB CARE I works. The program operates in ten countries at the national level or across all geographic areas of the country, while in the remaining eleven countries the program supports the national level as well as specifically assigned geographic areas. TB CARE I coverage in these countries ranges from 13% in Kazakhstan to 75% in Mozambique, with an average of about 46% of the population living in these assigned TB CARE I-supported geographic areas. With projects in 13 African countries, 67% (\$97 million) of TB CARE I's country obligations are in Africa, while 32% (\$46 million) of obligations are directed to nine Asian countries and just 1% of program obligations are invested in Latin America (\$2 million).

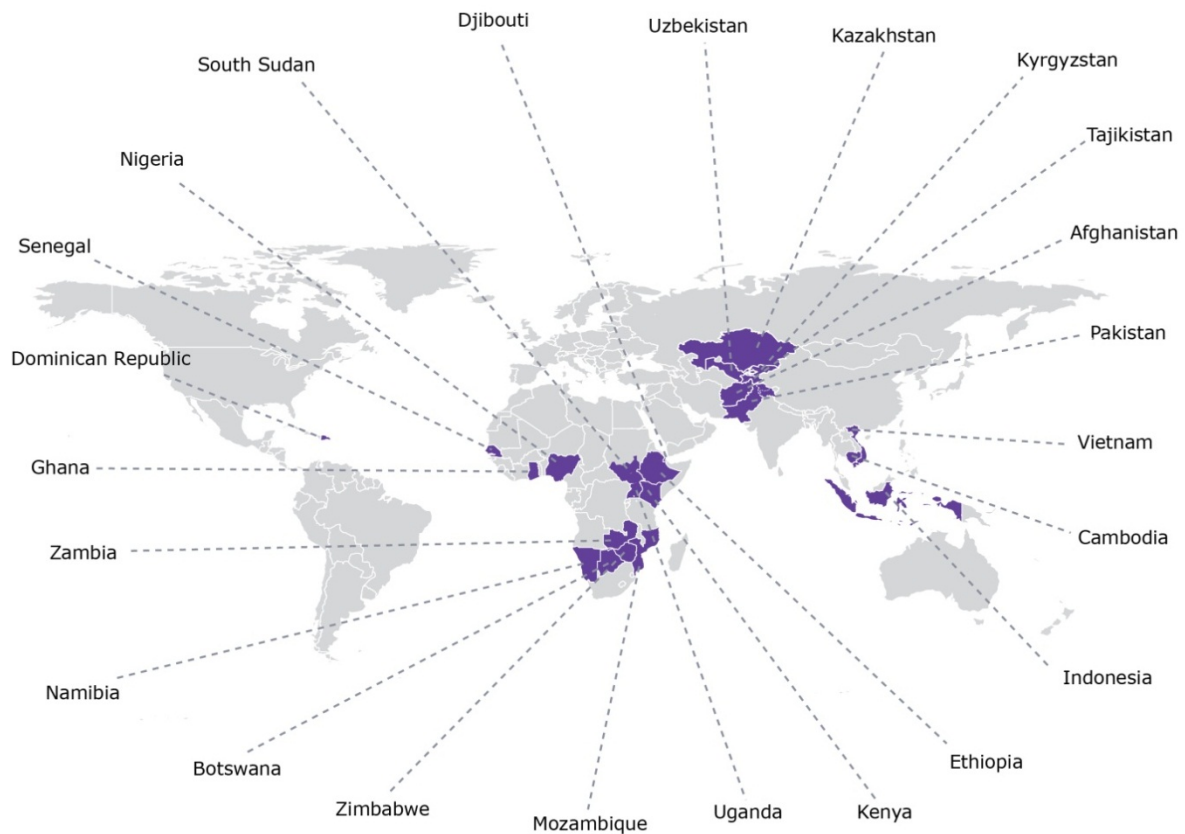
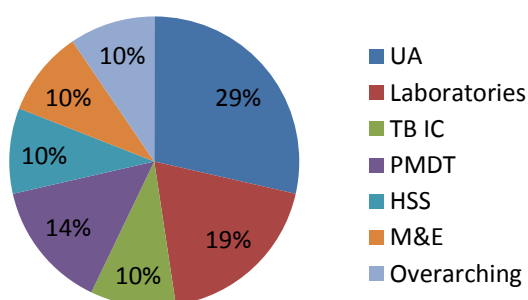


Figure 1: Map of TB CARE I countries

Each country project is designed to meet the needs of the national TB program and its stakeholders through some or all of the eight technical areas of the program. All projects work on Universal and Early Access to Care while only 62% and 29% of country projects work in TB/HIV and Drug Supply and Management respectively. The other technical areas are commonly represented in TB CARE I country workplans.

In addition to the 21 country projects, the program has been implementing four regional projects and 61 core projects (42 new and 19 continued from Year 1). Figure 2 shows the breakdown of the 42 core projects started in Year 2 across the eight technical areas.

Figure 2: Percent of core projects started in Year 2 by technical area (42 total projects)



TB CARE has selected indicators to address the expected outcomes defined under each technical area. Below is a summary of Year 2 results by technical area. Several indicators use WHO-collected data from the WHO *Global TB Report 2012*. Achievements and results from country, core and regional projects are also highlighted here. More detail on country-level activities and results can be found in the country-specific Annual Reports.

4.1 Universal and Early Access

Universal and Early Access (UA) is a priority for TB CARE I given the range of technical issues that it covers from a patient-centered approach to the quality of services being provided, whether in the public or private sector, in the community or in a prison. Activities work towards one of three expected outcomes: 1) Increased demand for and use of high quality TB services and improve the satisfaction with the services provided (Population/Patient Centered Approach), 2) Increased quality of TB services delivered by all care providers (Supply), and 3) Reduced patient and service delivery delays (Timing). Universal access is addressed in every country workplan (21) and in 12 Year 2 core projects.

Public Private Mix (PPM)

Several countries are aiming to better engage the private sector in the diagnosis and treatment of TB patients. Table 9 shows the current status of PPM implementation in TB CARE I countries. Sixteen countries have at least piloted a PPM intervention and seven countries (in bold) have moderate or substantial TB CARE I investment in PPM activities.

Table 9: Status of PPM implementation as of September 30, 2012

Countries with specific TB CARE I support in Year 2 are highlighted in bold.

No PPM activities	Piloted PPM	PPM strategy developed	PPM strategy implemented
Kazakhstan Kyrgyzstan South Sudan Tajikistan Uzbekistan	Dom. Rep. Mozambique Uganda Vietnam Zambia	Botswana Djibouti Namibia	Afghanistan Cambodia Ethiopia Ghana Indonesia Kenya Nigeria Zimbabwe

TB CARE I's considerable work in Cambodia is an excellent example of the program's investment in PPM activities. PPM coordination meetings were held, the PPM referral system was streamlined and trainings for provincial level staff, new private providers and national hospitals were conducted. As a result, 318 TB patients were diagnosed through PPM referrals from just 16 out of the 77 districts in Year 2; this puts the country on track to significantly exceed the national total of 706 patients that were diagnosed in 2011.

In addition, with core funding a PPM toolkit was developed under TB CAP and is being rolled out under TB CARE I starting with the development of training materials on engaging private for-profit providers and facilities in TB control. In-person training is planned for Year 3.

Perhaps in part due to TB CARE I PPM activities, a 40% increase in TB patients diagnosed by private providers and reported to the NTP was seen between 2010 and 2011 (see Table 10). Although data are not consistently available for every country, hopefully reporting will improve as PPM activities expand.

Table 10: TB patients diagnosed by private providers and reported to the NTP, 2010-2011 (WHO 2012)

TB CARE I Country	2010	2011
Afghanistan	430	819
Botswana	0	0
Cambodia	851	706
Djibouti		
Dominican Republic	181	0
Ethiopia		15,052
Ghana	550	723
Indonesia	1,310	4,890
Kazakhstan	0	
Kenya	7,162	9,300
Kyrgyzstan		
Mozambique		
Namibia		
Nigeria	13,567	
South Sudan		3,032
Tajikistan	484	0
Uganda		
Uzbekistan	0	0
Vietnam	3,190	4,320
Zambia		
Zimbabwe		
Grand Total	27,725	38,842

Childhood TB

As a part of the technical area of Universal Access, TB CARE I has been working to improve TB services for children. The program conducts activities on childhood TB in 11 countries (highlighted in bold in Table 11). The table shows the status of childhood TB implementation as of Year 2. Although this indicator was not measured in Year 1, it is promising to see childhood TB activities are being carried out in so many countries. With support from TB CARE I, Cambodia, Ethiopia, Vietnam, and Kazakhstan are all updating national policies, programs, protocols and strategic plans to ensure that they appropriately address TB in children. Uganda and Ethiopia have held workshops and established technical working groups with the objective of increasing momentum for the implementation and monitoring and evaluation of activities. Ghana, Tajikistan, and Vietnam are reviewing training materials and conducting trainings to ensure that providers are better equipped to identify and care for children with TB. Health care providers in eight TB CARE I countries have been trained on some aspect of pediatric TB (Cambodia, Indonesia, Kazakhstan, Zimbabwe, Zambia, Vietnam, Uzbekistan and Tajikistan).

Table 11: Year 2 status of childhood TB approach implementation
Countries with specific TB CARE I support in Year 2 are highlighted in bold.

Not in strategic plan	Mentioned in plan, but no implementation	Piloting/select implementation	Integrated in plan and regular activities
Dom. Rep. Namibia	Djibouti Ethiopia Kyrgyzstan South Sudan Uzbekistan	Botswana Cambodia Kazakhstan Kenya Uganda Vietnam	Afghanistan Ghana Indonesia Mozambique Tajikistan Zambia Zimbabwe

Table 12 shows the number of children under the age of 14 that have been diagnosed with TB. A slight increase (+9%) in diagnosis was seen between 2010 and 2011 (4,436 more children) across all TB CARE I countries. Additional work is clearly needed however given the very low or missing numbers reported in several countries. In TB CARE I countries, 5% of all reported TB patients (all forms) in 2011 were children, which is slightly lower than the estimated 6% of incident cases worldwide that are children. Quite a few countries report 0% or 1% TB among children, which suggests under-reporting.

Table 12: Number and percent of TB cases (all forms) diagnosed in children 0-14 years of age, 2010-2011 (WHO 2012)

Year of Data	2010		2011	
	#	% total cases	#	% total cases
Afghanistan	642	2%	2,422	9%
Botswana	523	7%	474	7%
Cambodia	99	0%	73	0%
Djibouti	48	1%	66	2%
Dominican Republic	72	2%	50	1%
Ethiopia	3,190	2%	3,830	2%
Ghana	670	4%	869	5%
Indonesia	28,312	9%	27,959	9%
Kazakhstan	733	3%	622	3%
Kenya	5,721	5%	5,788	6%
Kyrgyzstan	531	8%	19	0%
Mozambique	0	0%	0	0%
Namibia	103	1%	126	1%
Nigeria	1,116	1%	1,107	1%
South Sudan			99	1%
Tajikistan	491	7%	569	8%
Uganda	669	1%	695	1%
Uzbekistan	1,878	9%	1,592	11%
Vietnam	112	0%	125	0%
Zambia	0	0%	3,812	8%
Zimbabwe	4,371	9%	3,420	8%
Grand Total	49,281	4%	53,717	5%

TB CARE I is leading three global childhood TB projects in Year 2/3. One project aims to implement and evaluate child TB activities in four provinces of Indonesia. Training of child TB trainers took place in Year 2 and implementation and evaluation of activities will take place in Year 3. The TB CARE I program is also currently helping to develop the global *Guidance for National Tuberculosis Programmes on the Management of Tuberculosis in Children – second edition*. The document is expected to be released by December 2012. Lastly, a project is underway to improve childhood TB estimates using WHO global TB data and additional data collected directly from 18 target countries. Results are expected in November 2012.

Community-Based DOTS (CB-DOTS)

CB-DOTS continues to be a cornerstone of universal access. Six TB CARE I countries invested in CB-DOTS activities in Year 2, and steady progress since baseline (2010) can be seen. Table 13 shows 13 countries now have scaled up CB-DOTS programs with data available at the national level on CB-DOTS results. Mozambique and Afghanistan (two out of the six countries with CB-DOTS activities) both had considerable scale-up take place this year. In Mozambique, the innovative TB/malaria CB DOTS program was expanded to nine more districts in Year 2, totaling 45 TB CARE I-supported districts in total. As a result of extensive training of community activists and health technicians, 20,502 TB/malaria suspects were referred to health facilities and 3,354 active TB cases and 7,354 malaria cases were diagnosed.

In Afghanistan, CB-DOTS was expanded to nine additional provinces in Year 2. This resulted in the identification of 1,181 SS+ TB cases by community health workers (CHWs), which is a significant increase from the baseline level of 359 in 2009. Moreover, 2,209 TB patients received directly observed therapy from CHWs in these provinces compared to 853 in 2010 (a 2.6 fold increase).

Table 13: CB-DOTS implementation scoring, baseline through Year 2

Countries with specific TB CARE I support in Year 2 are highlighted in bold.

COUNTRY	Baseline	Year 1	Year 2
Afghanistan	2	2	3
Botswana	2	2	3
Cambodia	3	3	3
Djibouti	1	1	1
Dominican Republic	0	0	0
Ethiopia	2	3	3
Ghana	3	3	3
Indonesia	3	3	3
Kazakhstan	0	0	0
Kenya	3	3	3
Kyrgyzstan	0	0	0
Mozambique	2	2	3
Namibia	3	3	3
Nigeria	3	3	3
South Sudan	2	2	2
Tajikistan*			2
Uganda*			3
Uzbekistan*			0
Vietnam	3	3	3
Zambia	3	3	3
Zimbabwe	0	0	0
Average	1.94	2.00	2.10

0 = There is not a CB-DOTS program in the country and there are no plans prepared for this purpose.

1 = There is not a CB-DOTS program in the country but plans are ready for piloting.

2 = NTP has piloted CB-DOTS in selected geographic areas. An implementation plan including a timeline and budget with activities should be in the plan.

3 = NTP has scaled-up the implementation of CB-DOTS to additional geographic areas and data are available at the national level on CB-DOTS referrals and patients on treatment in CB-DOTS areas.

*New project in Year 2; data not available

Patient-Centered Approach

TB CARE I is applying patient-centeredness as one of its approaches to improve universal access to TB care for all people. In Year 1, TB CARE I started implementation of a core project to implement and adapt the Patient Centered Approach package, which was developed under TB CAP. The package includes a patient centered strategy and five tools—*QUOTE TB Light* to measure the quality of services from the patient perspective, the *Tool to Estimate Patient Costs* and the *Patient's Charter*, the *TB/HIV Literacy Toolkit* and the *Practical Guide to Improve Quality TB Patient Care*. Implementation of the package followed a two-year timeline with actual country activities planned for Year 2. Five TB CARE I countries were included—Cambodia, Indonesia, Mozambique, Nigeria and Zambia. At the end of two years it was expected that each of the five countries would have implemented three tools in the package. All participating countries are in different phases of

baseline data collection, implementation and evaluation, but the following results have been achieved in Year 2:

- The quality of TB services was measured in 26 health facilities in Year 2 (5 in Cambodia, 13 in Indonesia, 1 in Kazakhstan and 7 in Mozambique) using the TB CAP-developed *QUOTE*, *QUOTE Light* or equivalent tool. Nigeria is also in the process of measuring quality of services in 12 facilities. This is a considerable advancement over Year 1 where no countries had measured service quality. In Cambodia, the facility-specific results from the *QUOTE Light* process were shared within a few days with participating health facilities and recommendations were made to health center staff, health authorities and the NTP to improve the quality of services for TB patients. Results from the other countries will be available in Year 3.
- Ethiopia (12 facilities), Nigeria (12) and Kazakhstan (1) are in the process of measuring patient cost at the facility level using TB CAP's *Tool to Estimate Patients' Cost* or the *MDR-TB Patient Cost Tool* (Kazakhstan). Cost to patients had not been measured in any TB CARE I country since 2009 (Vietnam, Dominican Republic and Ghana). In Ethiopia, TB patients spent on average 26% of their median individual annual income (\$272.20) on direct and indirect costs related to their care. Also, after having TB, the median individual monthly income decreased by 33.3% and that of the total household income decreased by 72%.
- Implementation of the *Patient's Charter* has begun in four countries with the training of personnel on the document (Cambodia, Mozambique, Zambia and Zimbabwe). The Patient's Charter had not yet been adopted or implemented in any TB CARE I country during Year 1.
- *Learning from Loss*, the fifth tool in the PCA suite, has been developed will be available on the TB CARE I website by December 2012. This tool offers step by step guidance on how a coalition of committed stakeholders can learn from previous TB deaths to create the changes in health seeking behavior and quality of care needed to save patients' lives. Two approaches are used: the community death review and the facility TB mortality audit.

Innovative approaches

The program is piloting or scaling up activities in three countries that involve mobile phones to support DOTS implementation. In Uganda, TB CARE I has helped the NTP establish a system of calling patients who do not report for DOT or monthly medicine collection to improve treatment outcomes and data quality (see success story on page 27). In Cambodia, an internet-based SMS system has been developed to deliver sputum smear test results to healthcare workers and community TB volunteers. The turnaround time for sputum smear test results has decreased dramatically from 15 days in the first three months (Dec-Feb) to only four days in the last quarter of Year 2. (Photo: Cambodian doctor sending patient results by SMS message.)



TB CARE I has been supporting the NTP in Kenya to implement a new Information, Communication and Technology (ICT) system to improve program management at the NTP. The innovative ICT solution (also referred to as "Safaricom Project") is a two-pronged approach that ensures real time reporting is done to enable managers to easily access data for decision-making at all levels. The first component aims to strengthen and improve recording and reporting with real time data from the facility level up to the central unit, as well as provide feedback to lower levels. The second component aims to strengthen and improve governance and accountability through utilization of M-pesa (a mobile-phone based money transfer and micro-financing service) to make payments for supervision and MDR-TB patient support. Roll-out is just beginning, but the approach and potential results are promising.

Improving on reported TB treatment outcomes and patients' attitudes towards TB care by following up missing patients by phone, Uganda

In April 2012, a TB CARE I health facility assessment report in Uganda revealed that 27% of patients' treatment outcomes were unknown. As a result, the project provided pre-paid phone credit and patient diaries to the TB Unit focal persons of 23 TB clinics in Kampala district to call patients who had missed appointments or defaulted from treatment.

By June 2012, a total of 309 patients with unclear treatment outcomes had been contacted and 204 were confirmed as having completed TB treatment at other health facilities, 59 patients were confirmed dead, 24 were verified as defaulters and seven were treatment failures or were diagnosed with MDR-TB.

TB CARE I has seen that calling patients with missed appointments or with misclassified/unknown treatment outcomes can improve on reported treatment outcomes. This helps to get such patients back into care, to confirm who has not survived and to find out who has completed treatment elsewhere. Calling patients saved the clinic staff time and transportation costs. In addition, documentation of treatment outcomes improved and patients' attitudes to care were enhanced as reflected in the comments of the TB focal person at Rubaga Hospital:

"With the help of the diaries and phone credit, we are able to call patients who have missed their visits and thus reduce the number of defaulters...Patients feel that we care and they are encouraged. When we remind them with a phone call they actually come...As a result of the calls, the TB records are now better. They have helped us to know the real treatment outcome. Most of the patients we call 'defaulters' are not actually defaulters; some are dead whilst some are getting treatment elsewhere".

Below are some of the responses from patients who returned and restarted TB treatment:

"...I had thought of coming back to hospital but I was scared of returning for fear that the health workers would be angry with me. As I was stilling gathering the guts to return, I received a call asking me to come back I was so relieved". - 25 year old female patient

"...The health workers called me constantly.....So I was compelled to come..... I am very confident that I will complete my treatment this time". - 20 year old female patient

TB in Prisons

TB CARE I is implementing activities in seven countries on diagnosing and treating TB in prisons (see countries in bold in Table 14). On average, 44% of prisons in TB CARE I countries are



providing DOTS services already. In seven TB CARE I countries, the program has focused on prison activities where DOTS coverage is lagging behind (with only 28% DOTS coverage in selected prisons). This low coverage is likely to improve as implementation expands; for example, Namibia was in the early stages of consultation in Year 2, while engagement of prisons is expected in Year 3.

In Indonesia, the number of prison implementing DOTS with TB CARE I support increased from 10 to 20 in Year 2, resulting in 30,941 inmates screened for TB. Among these inmates, 417 were diagnosed with TB of which 100% were put on treatment. (Photo: Mobile x-ray in a West Java prison.)

Table 14: Number and percent of prisons providing DOTS, national level and TB CARE I geographic areas.

Countries with specific TB CARE I support in Year 2 are highlighted in bold.

Year of Data	2012 - National			2012 - TB CARE I investment		
COUNTRY	Number of prisons providing DOTS	Total number of prisons	Percent of prisons providing DOTS	Number of prisons providing DOTS	Total number of prisons	Percent of prisons providing DOTS
Afghanistan	34	35	97%			
Botswana	8	27	30%			
Cambodia	19	27	70%	7	27	26%
Djibouti	0	1	0%			
Dominican Republic	29	39	74%			
Ethiopia	U	U				
Ghana	12	45	27%			
Indonesia	34	436	8%	20	20	100%
Kazakhstan	94	94	100%	17	17	100%
Kenya	93	97	96%			
Kyrgyzstan	21	21	100%			
Mozambique	9	80	0%	9	80	11%
Namibia	U	13		U	13	
Nigeria	232	234	99%			
South Sudan	0	U				
Tajikistan	19	19	100%			
Uganda	37	360	10%	2	4	50%
Uzbekistan	3	U				
Vietnam	35	U				
Zambia	15	86	17%	15	86	17%
Zimbabwe	42	42	100%			
Total	736	1,656	44%	70	247	28%

Other UA achievements

Below are some additional UA achievements of TB CARE I country and core projects.

- Contact investigation guidelines have been developed and will be published soon. This document provides comprehensive global recommendations for NTPs on how to systematically evaluate persons who have been exposed to potentially infectious cases of TB.
- *Guidelines on screening for active TB* have also been developed and will be published by December 2012. This document covers TB screening standards, how to prioritize risk groups, and what screening methods and approaches to use.
- *A Compendium of Tools & Strategies to Achieve Universal Access for At-Risk & Vulnerable Groups* will be available soon to help NTPs consider which particular TB control strategies are likely to benefit particular vulnerable communities in their setting. The compendium offers very concise descriptions of over 120 TB control approaches and indicates whether there is evidence of benefit for particular at-risk and vulnerable populations. This compendium contains links to over 500 tools and reference materials.

4.2 Laboratories

TB CARE I works to strengthen laboratory systems in 17/21 countries, one regional project and seven core projects. TB CARE I has established three expected outcomes for laboratory strengthening activities:

1. Ensured capacity, availability and quality of laboratory testing to support the diagnosis and monitoring of TB patients;
2. Ensured availability and quality of technical assistance and services;
3. Ensured optimal use of new approaches for laboratory confirmation of TB and incorporation of these approaches in national strategic laboratory plans.

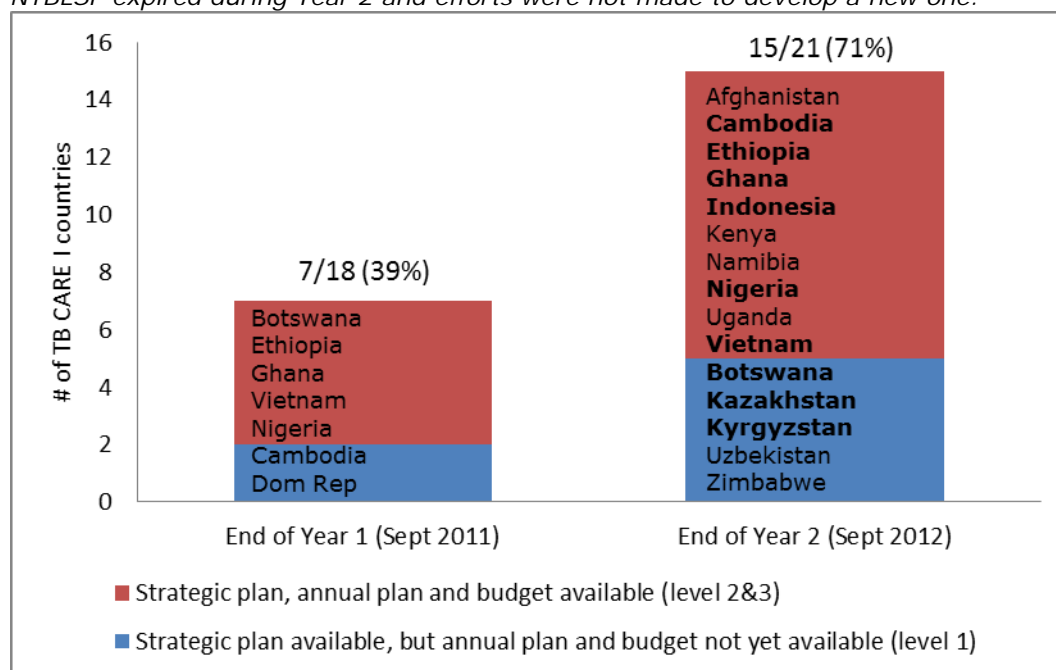
National Lab Strategic Planning

Considerable progress was made in the development or updating of National TB Laboratory Strategic Plans (NTBLSPs) during Year 2. While at the end of Year 1 only 39% (7/18) of the TB

CARE I supported countries had a NTBLSP developed, the proportion increased to 71% (15/21) by the end of Year 2 (Figure 3). TB CARE I specifically supported the development/updating of NTBLSPs in nine countries: Cambodia, Kazakhstan, Kyrgyzstan and Indonesia developed new NTBLSPs, while Botswana, Nigeria, Ghana, Vietnam and Ethiopia updated and/or further improved existing plans. The progress being made in Botswana and Nigeria resulted from specific support via the core project *Practical Handbook for National TB Lab Strategic Planning*, which was developed during Year 2 and used Botswana and Nigeria as pilot sites. The handbook is expected to be completed and globally available by December 2012.

Figure 3: NTBLSP development in Year 1 and Year 2

TB CARE I countries that received technical assistance in Year 2 are highlighted in bold (Zambia also supported). It is possible for countries to regress with this indicator. For example if the NTBLSP expired during Year 2 and efforts were not made to develop a new one.



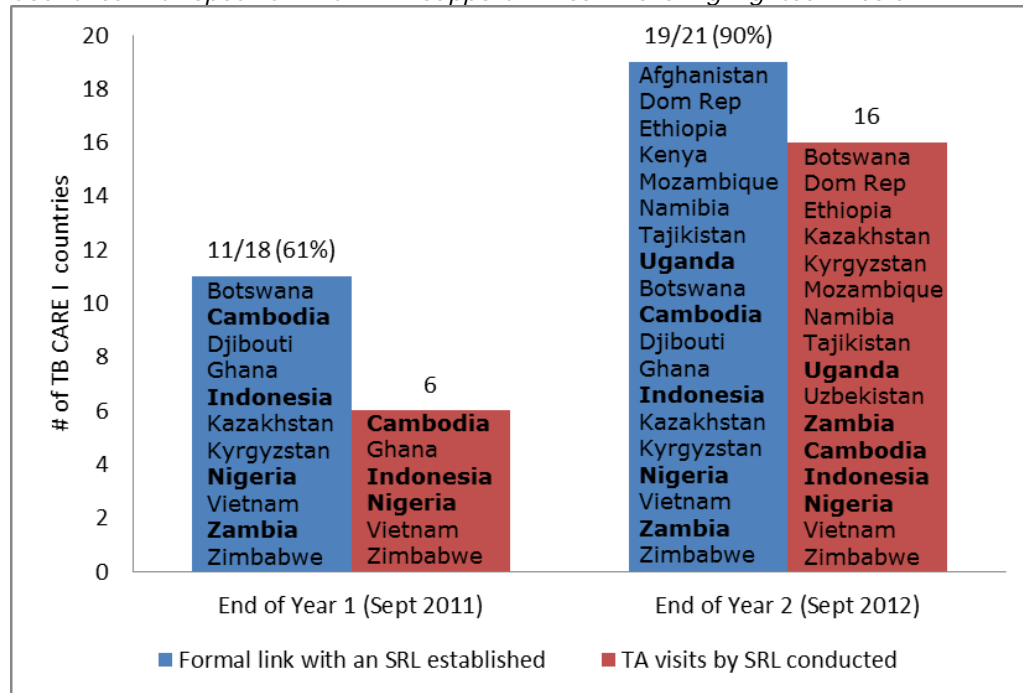
Supranational Reference Laboratory Network

In Year 2, there was a significant increase in the proportion of countries that have established a formal link with an SRL. While at the end of Year 1 only 61% (11/18) of countries reported an established link with an SRL, the number increased to 90% (19/21) at the end of Year 2 (Figure 4). As part of their terms-of-reference (ToR), the SRLs conducted technical assistance visits in 16/21 countries (76%).

The overall level of investment by TB CARE I in supporting SRL visits was already low in Year 2 (Cambodia, Ghana, Indonesia, Nigeria, Zambia) and the aim is to further decrease the investments in next year since TA visits by the SRLs (as part of the ToR) can be funded by WHO. The program is also supporting the development of National Reference Laboratories in Uganda and Benin into SRLs. SRL links were officially established this year between Benin and Niger as well as between Uganda and Zambia. Links with South Sudan, Tanzania and Somalia (with Uganda) and Togo (Benin) are also being explored.

Figure 4: Formal links established with an SRL and technical assistance visits conducted in Year 1 and Year 2

Countries with specific TB CARE I support in Year 2 are highlighted in bold.



Xpert MTB/RIF Implementation

Since the beginning of TB CARE I, Xpert implementation has been supported in 14/21 countries (67%) with either procurement of instruments and cartridges and/or technical assistance (Table 15). Procurement and technical assistance were provided in 11 countries (Cambodia, Djibouti, Ethiopia, Indonesia, Kazakhstan, Kenya, Mozambique, Nigeria, Vietnam, Zambia and Zimbabwe), which resulted in 48 GeneXpert instruments being procured and operational at the end of Year 2. TB CARE I's contribution represents 36% of the total operational numbers of GeneXpert instruments in these 11 countries. In Kyrgyzstan, Tajikistan, and Uzbekistan, TB CARE I supported Xpert implementation by providing solely technical assistance (TA).



As of the end of Year 2, 72% of planned GeneXpert instruments have been successfully implemented (48/67), i.e. were in routine use (Table 15). However, the delayed implementation of Xpert in Indonesia has proportionally the biggest impact on the overall level of achievement; the revised approach by the USAID mission in Indonesia, which requires the implementation of a well-functioning operational PMDT program prior to Xpert installation, delays the installation of 12 already procured devices.

Excluding Indonesia from analysis results in successful implementation of 86% of the targeted instruments in TB CARE I projects. For Year 3, an additional 36 instruments are in the pipeline, including those instruments already procured but not installed from Year 2, as well as additional newly planned instruments for Year 3 (Table 16).

In the seven countries in which Xpert has been successfully implemented with TB CARE I support, 8,523 Xpert MTB/RIF tests have been performed



during Year 2 (Table 16). From those tested, 3,566 were MTB positive (42%) of which 967 were MTB RIF resistant (27%). These results are not analyzed further here due to the lack of stratification according to suspect groups. A more detailed Xpert report on procurement, implementation progress and Xpert test results in the individual countries will be developed in the next quarter.

Xpert implementation at country level was supported by two regional Xpert workshops with the objective to further expand Xpert implementation and routine use at country level. An African workshop for early-implementers was held in Kenya with around 50 participants from Botswana, Ethiopia, Djibouti, Mozambique, Zambia, Zimbabwe and Kenya. A second South-East Asia workshop for advanced implementers was held in Indonesia, where 50 participants attended from Indonesia, Vietnam, Cambodia, Myanmar, Thailand, the Philippines and Nigeria. During both workshops, the participants reviewed their individual implementation plans and approaches, and developed a list of activities for further improvement. A third regional Xpert workshop as well as a global Xpert forum are planned in the coming year to provide an update on Xpert MTB/RIF roll-out and discuss practical experiences of scaling-up Xpert MTB/RIF implementation among NTPs and other stakeholders. (*Photo: Training of laboratory technicians in Vietnam on Xpert.*)

In order to strengthen the TB CARE I capacity to provide technical assistance and support to Xpert implementation at the country level, an Xpert training for national TB CARE I and II lab officers and lab consultants was conducted in The Hague, Netherlands. This covered all aspects of Xpert implementation, ranging from strategic planning to determination of Xpert impact and is expected to further improve the quality and speed of Xpert implementation in TB CARE I countries. (*Photo: Participants of the Xpert training in The Hague attending the practical training session conducted by Cepheid specialists.*)

New tools

Experiences and lessons learned from initial country Xpert MTB/RIF implementation were compiled to develop a comprehensive, step-by-step guide (*TB CARE I Roadmap to Xpert implementation*), which includes guidance on strategic approaches, operational and technical requirements as well as the minimum set of M&E indicators to be collected in all USG-supported countries. The roll-out in a handbook format is planned during Year 3 and aims to further guide Xpert roll-out and future scale-up.

The Xpert implementation projects also led to the development of comprehensive Xpert training materials, which will be reviewed by GLI and further developed into a globally standardized version in the coming year.

A new tool, *Assessment & accreditation of microscopy laboratory networks*, has been developed during Year 2. Together with the *GLI tool for laboratory accreditation & roadmap for National Reference Laboratories*, which was developed in Year 1 and improved during Year 2, this forms the TB CARE I tool package for TB laboratory accreditation. Both tools will be rolled-out during international conferences such as the Union Conference in November 2012 and/or the African Society for Laboratory Medicine Conference in December 2012.

Table 15: Summary of TB CARE I investment and procurements to date (Year 1-2)

COUNTRY	Investment		Operational GeneXpert instruments		
	Investment in Xpert implementation	Type of TB CARE I investment	# operational instruments (National level)	# of operational instruments (TB CARE I)	National coverage procurement (%)
Afghanistan			0	0	N/A
Botswana			0	0	N/A
Cambodia	Yes	P/TA	11	3	27%
Djibouti	Yes	P/TA	1	1	100%
Dom. Rep.		N/A	0	0	N/A
Ethiopia	Yes	P/TA	2	0	0%
Ghana			0	0	N/A
Indonesia	Yes	P/TA	5	5	100%
Kazakhstan	Yes	P/TA	4	4	100%
Kenya	Yes	P/TA	22	3	14%
Kyrgyzstan	Yes	TA only	7	0	0%
Mozambique	Yes	P/TA	8	0	0%
Namibia			4	0	N/A
Nigeria	Yes	P/TA	34	15	44%
South Sudan			0	0	N/A
Tajikistan	Yes	TA only	3	0	0%
Uganda			26	0	N/A
Uzbekistan	Yes	TA only	1	0	0%
Vietnam	Yes	P/TA	22	17	77%
Zambia	Yes	P/TA	1	0	0%
Zimbabwe	Yes	P/TA	12	0	0%
TOTAL	14		163	48	29% (36%*)

*P/TA: Country invests in procurement (P) of GeneXpert instruments and commodities as well as technical assistance (TA). TA only: Country supports implementation by technical assistance only.
National coverage excluding countries without GeneXpert procurement plans in Year 2 (Kyrgyzstan, Tajikistan, Uzbekistan).

Table 16: Summary of Xpert achievements, future plans and test results to date (Year 1-2)

COUNTRY	Achievements & future plans			Xpert MTB/RIF tests and results				
	Target # of installed instruments at start of Year 2 (TB CARE I)	% Achievement end of Year 2 (TB CARE I)	Pipeline for Year 3 (TB CARE I)	# Xpert tests conducted (National)	# Xpert tests conducted (TB CARE I)	# Xpert MTB positive (TB CARE I)	# Xpert MTB Rif resistant (TB CARE I)	% Xpert MTB Rif resistant (TB CARE I)
Afghanistan	0	N/A	0	0	N/A	N/A	N/A	
Botswana	0	N/A	0	0	N/A	N/A	N/A	
Cambodia	3	100%	0	U	2,302	541	70	13%
Djibouti	1	100%	0	136	136	47	17	36%
Dom. Rep.	0	N/A	0	0	N/A	N/A	N/A	
Ethiopia	2	0%	3	U	0	0	0	
Ghana	0	N/A	0	0	N/A	N/A	N/A	
Indonesia	17	29%	12	1,015	1,015	598	235	39%
Kazakhstan	4	100%	0	774	774	348	203	58%
Kenya	3	100%	0	U	1,084	480	23	5%
Kyrgyzstan	0	N/A	0	2,286	N/A	N/A	N/A	
Mozambique	3	0%	3	U	0	0	0	
Namibia	0	N/A	0	120	N/A	N/A	N/A	
Nigeria	14	107%	8	2,009	2,009	682	210	31%
South Sudan	0	N/A	0	0	N/A	N/A	N/A	
Tajikistan	0	N/A	0	748	N/A	N/A	N/A	
Uganda	0	N/A	0	1,181	N/A	N/A	N/A	
Uzbekistan	0	N/A	0	U	N/A	N/A	N/A	
Vietnam	17	100%	0	U	1,203	870	209	24%
Zambia	3	0%	3	U	0	0	0	
Zimbabwe	U	U	7	3,175	0	0	0	
TOTAL	67	72%	36	11,444	8,523	3,566	967	27%

Pipeline for Year 3: Number of procured instruments that could not be implemented in Year 2 plus number of new instruments planned in Year 3.
N/A: Not applicable, U: unknown

Unique Transportation Project Significantly Improves TB Diagnosis in Three Zimbabwean Cities

Lack of access to sputum microscopy services in urban and rural areas is a major barrier to effective TB control in Zimbabwe. Getting sputum samples from a patient suspected of having TB to the laboratory is a significant challenge. Consequently, many people remain undiagnosed and untreated. The same problem exists at the end of treatment—without sputum results it cannot be determined whether the patient has been cured.

In collaboration with Riders for Health, an international NGO with expertise in transportation management, TB CAP initiated a specimen transportation system in June 2010 in the cities of Bulawayo, Chitungwiza, and Harare, covering a population of 2.6 million. The system delivers all types of specimens to the laboratory, in addition to the sputum samples, using seven motorcycles and Council drivers hired and supervised by Riders for Health. Sputum and other samples are collected daily from a total of 56 primary care clinics. The samples are taken to three laboratories, one in each city. The riders also collect test results from the laboratories for distribution back to the clinics.

As of December 2011, 36,810 sputum specimens, and 60,833 blood, urine, stool, and Dried Blood Spot specimens for early infant diagnosis of HIV infection had been transported, with 91,294 test results delivered back to the participating primary care clinics. The project contributed significantly to the early diagnosis and treatment of 4,720 new smear sputum positive patients during the period under review. TB results are not getting lost and the turnaround time for delivery of sputum test results has been reduced from an average of 11 days to three days. Patients may therefore be started on treatment earlier, and those patients who are not responding to treatment are identified early and referred to a specialist.

A TB clinic nurse stated: *"We used to collect samples from patients and keep them for three or four days, and sometimes we were forced to discard the sample because there was no reliable transport to take the specimen to the laboratory. If the samples were collected, we would not get the results or they would come back after three to four weeks. With the introduction of the courier system, there is now regular and assured transport. Patients had lost confidence in us because the service delivery was poor, but now more and more patients are coming to be tested for TB because they are assured that they will get their results within two days."*

Laboratory staff and patients are also pleased with the improved service. A TB patient in Bulawayo said: *"I was told to come for my results on Wednesday when my sputum had been collected on Monday. I just came in doubt as everyone had told me that these things take a long time. I found the results present."*

The transportation system has eliminated the need for patients suspected of having TB to travel long distances and incur associated transportation costs. It has improved efficiency in the diagnosis of tuberculosis and other diseases and, consequently, improved TB control outcomes. The system is currently being scaled up in rural areas under TB CARE I, focusing initially in five districts. (Photo: Commissioning of the sputum transportation system in Harare, Zimbabwe.)



4.3 Infection Control

TB CARE I works to improve TB infection control in 16/21 countries and four core-funded projects. The program's commitment to this technical area is summarized by four expected outcomes:

1. Increased TB-IC political commitment
2. Scaled-up implementation of TB-IC strategies
3. Strengthened TB-IC monitoring & measurement
4. Improved TB-IC human resources

Table 17 shows the status for key TB-IC indicators as of the end of Year 2. The results are discussed below in greater detail.

Table 17: Overview of TB-IC indicators – Baseline, Year 1 and Year 2

Country	Approved national TB IC guidelines			TB-IC is included in the national Infection Prevention Control (IPC) policy			# facilities where TB-IC has been supported by TB CARE I			National surveillance system monitors TB among HCWs		
	B	1	2	B	1	2	B	1	2	B	1	2
Afghanistan	Y	Y	Y			Y	U	20	60			
Botswana	Y	Y	Y				N/A	N/A	N/A			
Cambodia			Y	Y	Y	Y	0	0	44			
Djibouti							U	1	16			
Dom. Rep.				Y	Y	Y	U	U	6			
Ethiopia	Y	Y	Y	Y	Y	Y	U	U	89			
Ghana	Y	Y	Y	Y	Y	Y	0	0	6			
Indonesia	Y	Y	R			Y	11	11	207			
Kazakhstan				Y	Y	Y	U	U	0	Y	Y	Y
Kenya	Y	Y	Y			Y	U	U	44			
Kyrgyzstan							N/A	N/A	0	Y	Y	Y
Mozambique	Y	Y	Y			Y	U	U	N/A			
Namibia	Y	Y	Y	Y	Y	Y	U	U	34			
Nigeria	Y	Y	Y			Y	U	U	63			
S. Sudan							N/A	N/A	N/A			
Tadjikistan		Y	Y				N/A	N/A	0			
Uganda		Y	Y			Y	U	U	1			
Uzbekistan							N/A	N/A	N/A			
Vietnam		Y	Y			Y	U	U	35			Y
Zambia	Y	Y	Y	Y	Y	Y	U	U	15			
Zimbabwe							U	42	42			
Total	10	13	14	7	7	14	U	74	662	2	2	3
% of countries	48%	62%	67%	33%	33%	67%	-	-	67%	10%	10%	14%

B=baseline 2010; Y=Yes; R=Revision; U=Unknown; N/A=Not Applicable

Availability of National Guidelines

National TB-IC guidelines are available in 14 countries; new is Cambodia in Year 2. Indonesia was the first country to revise their existing guidelines in Year 2; Namibia is planning a revision for next year. Development of guidelines is in progress in Kazakhstan, Kyrgyzstan, South Sudan, Uzbekistan and Zimbabwe, which will considerably increase the number of countries with guidelines next year. Mozambique has had national guidelines since 2007². Development and revision of technical guidelines offers an opportunity for prioritizing active case finding, separation, rapid diagnosis and effective treatment. See the TB-IC Core package below.

TB-IC Included in National IPC Policy

This year, the number of countries reporting that TB-IC is included in the national Infection Prevention and Control (IPC) policy has doubled to 14 countries. TB CARE I together with WHO will evaluate what is needed for further scale-up as TB-IC being included in the general IPC policy is thought to result in more sustainable integrated uptake of TB-IC policy and practices. Targets for Years 4 and 5 will be set based on this evaluation.

² In the Year 1 Annual Report we reported incorrectly that Mozambique had no guidelines.

Facility Level Implementation

A significant expansion of facility level implementation has taken place in Year 2, although it is premature to conclude that implementation is going to national scale. Afghanistan, Djibouti and Indonesia show considerable expansion between Year 1 and Year 2 of facilities implementing TB-IC with TB CARE I support. In Afghanistan, 60 health facilities (compared to 20 in Year 1) were upgraded with TB-IC measures through training, establishment of TB-IC committees, and identification of focal



persons, refurbishment and quarterly TB-IC assessments. The actual implementation rate across all TB CARE I countries achieved 64% of the targeted 1,038 facilities in Year 2.

In Year 2, Botswana, Mozambique, South Sudan and Uzbekistan were the only countries where TB CARE I did not plan to support facility level implementation of TB-IC. However, this may be a reflection of TB CARE I's role in the country, not an indication of the actual TB-IC situation in those countries. Botswana is known to be one of the most successful countries in scaling-up TB-IC under the auspices of the National TB program.

(Photo: TB-IC training in Kyrgyzstan)

TB Surveillance among HCWs

Countries should report annual numbers of HCWs with TB to WHO. WHO then calculates the TB incidence in the HCW population. If the TB incidence among HCWs is close to the TB incidence among the general population this indicates effective TB-IC implementation (impact indicator). Two countries, Kazakhstan and Kyrgyzstan have surveillance systems monitoring active TB (all forms) among HCWs. Vietnam established a national surveillance system this year to monitor the occurrence of TB disease among HCWs working at 63 provincial TB hospitals and units across the country. Through this sentinel surveillance system for a selected sample population 27 HCWs with TB were notified in 2011 (although not reported to WHO).

Global efforts for accelerated scale-up of TB-IC

TB CARE I also implements global initiatives to support TB-IC implementation and scale-up at country level. When possible, the TB CARE I and II coalitions work together on a project. The following initiatives were undertaken in the reporting period:

Field-testing of a guide for monitoring TB disease among HCWs at country level

TB is a well-established occupational hazard for HCWs. In Year 1, two companion guides for measuring the occurrence, the prevalence and the incidence, of active TB disease among HCWs were developed. This year, the draft incidence guide was field-tested in Ghana and Cambodia, countries that had no program for the screening of HCWs for TB or a national notification system that is able to provide data of HCWs with TB. The draft incidence guide was also field-tested in Kyrgyzstan, a country with an already existing screening program and surveillance system. The guidelines should help countries to establish a screening program and surveillance system for detecting and monitoring TB disease among HCWs. Also, surveillance should provide the evidence for effective TB-IC implementation. The prevalence guide is already available on the TB CARE I website and the incidence guide will be published on the website by January 2013.

TB-IC Core Package

TB CARE I participated in this TB CARE II-led project by introducing the TB-IC Core Package in Zambia. The Core Package, also dubbed as the *FAST* strategy, is a well-defined sub-set of the WHO recommended set of administrative controls: **F**inding cases **A**ctively, **S**eparating them safely and **T**reating them effectively. Two health facilities have been selected for piloting. Next year, guidelines that include a detailed implementation protocol for the introduction of the Core Package at facility level will be developed and expanded to other countries.

Training & mentoring on TB-IC

Building capacity of national and international TB-IC consultants is and will remain important. In Year 1, TB CARE I trained 12 consultants, most of whom work in African countries. This year, a total of 16 consultants (6F/10M) were trained, 13 from Asian countries. Of those trained, seven (2F/5M) were mentored to become international consultants. They were pooled with the five (1F/4M) international consultants who were trained and mentored in Year 1. To date, 22 independent international consultancies have been conducted by the 12 mentored international TB-IC consultants after they accomplished the training & mentoring program.

The pool of international consultants now comprises architects (2), biosafety experts (2) and public health practitioners (14), six of which were trained under TB CAP. In Year 3, the training & mentoring program will become a joint project of the TB CARE I and II coalitions uniting two global capacity building activities: the Harvard TB-IC course and the mentored field visits.

Ndola District TB-IC demonstration site

In Year 2, the TB CARE I flagship of the IC technical area was a demonstration project introducing an array of interventions in 15 healthcare facilities in Ndola district, Zambia, known for the high burden of TB and HIV/AIDS. First, 10% of the staff was trained on TB-IC, including affiliated TB Treatment Supporters. The trained staff conducted a risk assessment of their facility and developed a facility plan with budget by using the respective tools provided at the training. The facility plans were endorsed by the district medical office and incorporated in the 2013 district action plan.

IEC materials were introduced, such as signage 'to keep a window open' and 'cover-your-cough' posters reminding staff and patients of precautions to be taken. In addition, a pocket guide with standards and procedures was developed and printed. Each HCW has a personal copy of the job aid. Lastly, simple renovations were carried out to enhance (natural) ventilation or to enable the separation of patients with presumptive or diagnosed infectious TB.

In nine months, compliance with TB-IC practices rose from 27% to 58% using a CDC standard monitoring tool. By the end of the demonstration project in September 2013 the target is to achieve 80% compliance.

Training and Mentoring Program Yields Visible and Measurable Improvements in Infection Control Practices in Ethiopia

With support from the previous TB CAP project, an assessment of TB-IC practices was undertaken in 2008 in Ethiopia. The results indicated that TB-IC did not exist at any level of the health care system. TB-IC guidelines and training materials were not available, nor had health care personnel been trained in TB-IC.

Since that date, both the TB CAP project and the current TB CARE I project have prioritized TB-IC interventions. In collaboration with the Federal Ministry of Health, national guidelines, training materials, and other supporting documents have been developed, serving as an essential foundation for the initiation and expansion of TB-IC activities throughout the country. Since 2009, more than 1,000 health personnel and program managers have been trained in TB-IC with technical and financial support of TB CAP and TB CARE I. Of those trained, 34 health care workers from 13 facilities in one region — Addis Ababa City Administration Health Bureau — were closely followed up through mentorship visits scheduled three months after the training. The follow-up visits found that nine of the thirteen health facilities (70%) had established a coordination body to address both infection prevention in general and TB-IC specifically in the short time period since the training. Infection prevention coordinating bodies already existed at the other four facilities and their functioning was strengthened to implement infection prevention interventions in the context of tuberculosis control.

The follow-up visits also revealed that TB-IC plans had been developed by 10 facilities (77%) and 12 facilities (93%) had instituted a process to expedite the management of patients suspected of having TB. These facilities triaged patients by quickly assessing their cough, and on that basis, taking appropriate infection control precautions.

In addition to changing certain managerial and administrative procedures, some of the health facilities mobilized their own resources to implement both major and minor renovations. Akaki Health Center is one such facility. The TB-IC training included a visit to the Geda Health Center in Adama Oromiya, a model TB clinic renovated with assistance of TB CARE I. Following the training, the Akaki Facility undertook renovations based on what staff learned from the visit to the model clinic.

Ato Desalegn Merja, head of Akaki Health Center, who participated in the training said: "We have taken lessons on what to improve and how to intervene in our facilities by visiting Geda Health Center during the training. We were able to renovate the general outpatient department waiting area, walkway, card rooms, triage rooms, and TB room by allocating budget from our own resources. We believe that the renovated [areas] will be attractive and safe places to work in and stay for staff and clients, which undoubtedly brings a decline in TB transmission in health facilities." *(Photo: The renovated waiting area, card room, triage rooms and walkway at Akai Health Center.)*



4.4 Programmatic Management of Drug Resistant TB (PMDT)

PMDT scale-up is a high priority for TB CARE I. In Year 2, PMDT activities were implemented in 16 TB CARE I countries as well as through one regional and six core PMDT projects. The main expected outcome of PMDT activities is improved diagnosis and treatment success of M/XDR-TB. Two core indicators are used to measure the project impact on PMDT scale up – number of MDR-TB cases diagnosed and number of MDR-TB cases put on treatment (see Section 3 for these data). Not all countries are yet able to diagnose and report on XDR-TB, but TB CARE I's PMDT strategy addresses XDR-TB as well.

The country activities are mainly focused on improving access to diagnosis (Xpert MTB/RIF implementation, diagnostic algorithms, risk group selection, patient referral) and improved access to treatment (policies, guidelines, protocols, treatment support, trainings and technical assistance). The program provides social support for MDR-TB patients in Ethiopia, Cambodia, Indonesia and Kenya.

Access to diagnosis

Globally less than 5% of new and previously treated TB patients were tested for MDR-TB in most countries in 2010. With the exception of the CAR countries, where new patients should also receive culture and DST, all other country policies state that only re-treatment patients should routinely receive culture and DST for diagnosis of DR-TB. Not all TB CARE I countries reported on the percentage of TB patients tested for MDR-TB, but of those who reported, 15% of retreatment patients were tested in both 2010 and 2011 (Table 18). Looking across all 16 TB CARE I PMDT countries, a small increase in percent of retreatment cases receiving DST is seen from 2010 (10.8%) to 2011 (11.6%). Programmatic priority setting, logistics of specimen transportation, and laboratory capacity constraints explain this low level of MDR-TB screening among retreatment patients. While the introduction of GeneXpert may considerably reduce laboratory turn-around time for diagnosis of rifampicin resistance, its overall impact will remain limited in the absence of an efficient and quick system of specimen transportation and result feedback, as well as policy and capacity supporting immediate start of MDR-TB once MTB/RIF is positive.

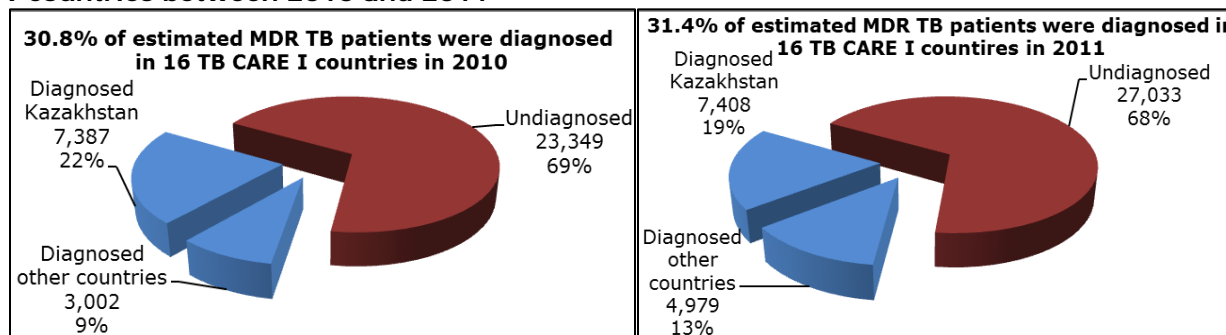
Table 18: Number and percent of retreatment cases tested for MDR-TB in 16 TB CARE I countries with PMDT activities, 2010-2011 (WHO 2012)

Country	2010			2011		
	# retrt cases tested w/ DST	# retrt cases	% retrt cases tested w/ DST	# retrt cases tested w/ DST	# retrt cases	% retrt cases tested w/ DST
Cambodia	93	1,634	5.7%	190	1,482	12.8%
Ethiopia	510	4,898	10.4%	139	4,621	3.0%
Ghana	21	1,021	2.1%	61	878	6.9%
Indonesia	324	6,589	4.9%	695	7,707	9.0%
Kazakhstan	4,655	9,213	50.5%	4,790	8,680	55.2%
Kenya	706	10,479	6.7%	1,195	10,017	11.9%
Kyrgyzstan	264	987	26.7%	232	1,074	21.6%
Mozambique	251	4,048	6.2%	443	4,252	10.4%
Namibia		2,522			2,362	
Nigeria	19	8,993	0.2%	76	8,787	0.9%
Tajikistan	223	985	22.6%	415	929	44.7%
Uganda	356	3,952	9.0%	360	4,014	9.0%
Uzbekistan	1,180	4,596	25.7%	123	1,074	11.5%
Viet Nam		8,408			8,639	
Zambia		6,310			6,636	
Zimbabwe		4,685		0	4,345	0.0%
Grand Total	8,602	79,320		8,719	75,497	
Average for countries that reported on DST			14.99%			15.07%
Average across all countries listed			10.84%			11.55%

Based on the *WHO Global TB Report 2012*, estimates for MDR-TB cases in the 16 TB CARE I countries with PMDT activities increased from 33,738 in 2010 to 39,420 in 2011. The absolute number of diagnosed MDR-TB patients in 2011 increased to 12,387 compared to 10,389 in 2010 (baseline).

Because both the number diagnosed and the estimates increased, the percent of estimated MDR-TB cases being diagnosed increased by less than 1% between 2010 and 2011 (see Figure 5). The biggest achievement over this time period was that the proportion of diagnosed cases in TB CARE I countries other than Kazakhstan substantially increased from 3,235 to 5,167 (in 2010, 70% of all diagnosed MDR-TB patients in TB CARE I countries were from Kazakhstan, while in 2011 this reduced to 59%).

Figure 5: Percent of estimated MDR-TB cases that are diagnosed (confirmed) in 16 TB CARE I countries between 2010 and 2011

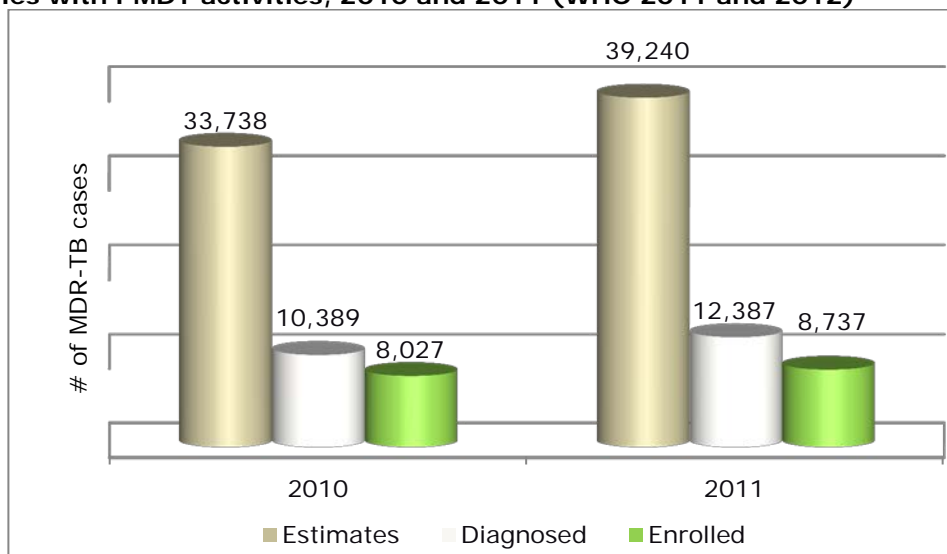


Preliminary results of Xpert MTB/RIF implementation show a positive impact on MDR-TB diagnosis (see laboratory chapter), although Xpert's impact on MDR-TB diagnosis is expected to be more evident next year.

Access to treatment

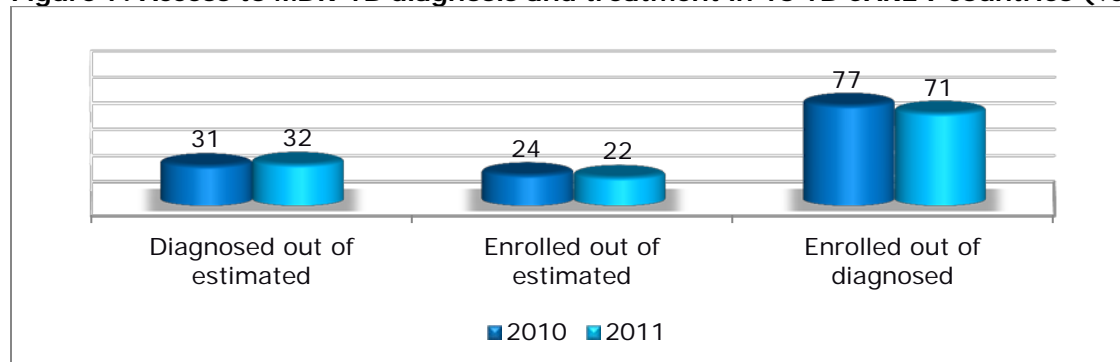
In absolute numbers there was a slight increase in patients put on treatment – 8,911 in 2011 compared to 8,262 in 2010 (8,737 versus 8,027 in the 16 TB CARE I countries with PMDT activities, see Figure 6). However, the percentage of estimated MDR-TB cases enrolled on treatment did not increase as the estimates also increased (WHO 2012).

Figure 6: Number of estimated, diagnosed and enrolled MDR-TB cases in 16 TB CARE I countries with PMDT activities, 2010 and 2011 (WHO 2011 and 2012)



Although the absolute numbers of diagnosed and enrolled MDR-TB patients are increasing, the pace of expansion is very slow. Figure 7 shows that only 22% of estimated MDR-TB patients have been put on treatment and only 71% of diagnosed cases have been enrolled on treatment in 2011.

Figure 7: Access to MDR-TB diagnosis and treatment in 16 TB CARE I countries (%)



In line with TB CARE I's strategy to scale up PMDT, 19 TB CARE I countries have an established, functioning National PMDT coordinating body (only Djibouti and South Sudan do not have a PMDT coordinating body). TB CARE I has supported the establishment and capacity building of national coordinating bodies and will continue to support them to ensure country ownership, sustainability and quality of MDR-TB programs.



TB CARE I is supporting quality-assured and evidence-based clinical management of MDR-TB. It is measured by 6-month culture conversion rate and final MDR-TB treatment outcomes. Data on final MDR-TB treatment outcomes are available for 2009 (before project initiation). MDR-TB treatment success rates range from 35-90%. Activities are included in country work plans to improve treatment outcomes and data collection for MDR-TB treatment outcomes. *(Photo: MDR-TB patient undergoing treatment in an Indonesian prison hospital.)*

Highlights of TB CARE I support

TB CARE I is supporting the Regional Center of Excellence (CoE) in Kigali, Rwanda, which is organizing trainings on IC, laboratories and PMDT. In July 2012, the 3rd International PMDT Course for African Countries was held. The overall goal of the course was to provide an overview of the global and regional PMDT situation, the latest policies and developments in regards of DR-TB diagnostic, treatment and care. The target group for this course was PMDT managers/coordinators, MDR-TB focal points and clinicians specialized and/or working in DR-TB Clinics in African countries. Participants from ten countries attended - Botswana, Burundi, Ethiopia, Liberia, Kenya, South Sudan, Tanzania, Uganda, Zambia and Rwanda. Of the total 37 participants, eight were sponsored by USAID TB CARE I through the CoE, while the other 29 were funded by either the Ministry of Health, Rwanda or TB CARE I country projects.

In April 2012, TB CARE I organized and facilitated a regional Workshop "Programmatic Management to Strengthen M/XDR-TB Control in Central Asia" with participation from the NTPs and the main partners in Kazakhstan, Kyrgyzstan, Uzbekistan, Tajikistan and Turkmenistan. This workshop served as a starting point for developing each country's national response to the Consolidated Action Plan to Prevent and Combat M/XDR-TB in the WHO European Region. It also served as a venue for mapping, performing gap analyses and planning of interventions for NTPs and technical partners. During the workshop the strategic directions of the Consolidated Action Plan and country-specific action plans were presented and discussed by each country with the support of the partners and facilitators. As a follow-up TB CARE I together with WHO country offices organized and facilitated workshops on development of National MDR-TB action plans in Uzbekistan and Kyrgyzstan.

TB CARE I participated in six core projects. Below are a few key highlights:

- A cost effectiveness model for MDR-TB treatment was developed and tested with Indonesia data. The model and results are expected in December 2012.
- The cost to MDR-TB patients is being assessed in Kazakhstan, Indonesia and Ethiopia. Results are expected in December 2012.
- A DR-TB learning website (lead by TB CARE II) has been developed. Clinical cases with expert comments are available on regimen design, side-effects management, drug management, adherence and social support, managing high-risk patients. TB CARE I partners provided expert opinion on each case. Published cases are available at www.drtnetwork.org and are used for face-to-face training.
- TB CARE I reviewed training materials, the participants manual and the facilitator guide for a PMDT management course lead by TB CARE II. The program also supported TB CARE II in the development of an MDR-TB suspect register template. These materials are available electronically at www.drtnetwork.org.

The performance of the M&E system in most countries is insufficient for PMDT. It is quite complicated to collect the key PMDT indicators and ensure proper case and treatment outcome recording/reporting in most countries. Several TB CARE I countries like Cambodia, Namibia, Nigeria, Vietnam and Indonesia are rolling out or implementing e-TB manager (see M&E section for more information). This will greatly improve the M&E system, but it cannot be a cure all; if the underlying M&E system is not in place with proper data recording, checking and interpretation, quality data will not be available. Starting in Year 3, TB CARE I will be helping NTPs to better collect and interpret their MDR-TB data.

In Year 2, TB CARE I developed a strategic approach to assisting countries with PMDT scale up and implementation. Built on five pillars, below is a brief outline of TB CARE I's strategic priorities in the coming years:

- 1) Political commitment and country ownership:
 - Country specific PMDT Task forces/committees
 - Targets and expansion plans
 - Coordination and monitoring
 - National policy based on international guidelines
 - Technical assistance and training based on country needs
 - Capacity of Technical Collaborative Centers, Centers of Excellence
 - Expansion and sustainability of governmental financing
- 2) Availability and access to quality assured and fast diagnostics:
 - Xpert MTB/RIF implementation
 - Network of quality assured culture and DST laboratories (link with SNRLs)
 - Diagnostic algorithms based on country specific risk groups and available diagnostics
 - QA DST to fluorquinolones and second line injectables (XDR diagnosis)
- 3) Standardized patient management and second-line drugs treatment, with appropriate patient support provided:
 - Training, TA and monitoring on diagnosis, treatment and follow up for clinical staff (including HIV program, PHC, private practitioners, nurses)
 - National TB/MDR-TB guidelines, clinical protocols based on latest international recommendations
 - Ambulatory care
 - Linkage with private practitioners
- 4) Uninterrupted supply of quality assured second-line drugs:
 - Country specific 3-year forecasts
 - To ensure adequate financing and timely procurement of SLDs
 - To provide evidence and forecast to GDF on supply needs
 - Early warning system
 - TA on procurement and supply management
 - Adequate SLDs stocks (monitoring)
- 5) Monitoring and evaluation. Link with laboratories:
 - information flow
 - adequate registration
 - Registration and follow-up of all diagnosed M/XDR-TB patients

- # of patients diagnosed
- # of patients put on treatment
- regular update on backlog of diagnosed MDR-TB patients
- Standardized case and treatment outcome definitions
- Well-functioning recording & reporting system, including electronic registration systems
- Use of collected data for improvement of program performance and to provide evidence for policy change

4.5 TB/HIV

The program implements TB/HIV-related activities in 13 country projects, ten of which have PEPFAR-supported activities or workplans (Ethiopia, Ghana, Kenya, Namibia, Nigeria, South Sudan, Uganda, Vietnam, Zambia and Zimbabwe). No TB CARE I TB/HIV core projects were initiated in Year 2 as this is a priority area for TB CARE II. The program's TB/HIV activities work towards the following expected outcomes:

1. Strengthened prevention of TB/HIV co-infection
2. Improved diagnosis of TB/HIV co-infection
3. Improved treatment of TB/HIV co-infection

Screening for TB

Although improvements in reporting are still needed, progress is being made in expanding TB screening among HIV positive clients. From 2010 to 2011, 280,549 more patients were reported to have received TB screening during their last visit. Table 19 shows a substantial increase in screening in Ethiopia, Nigeria and Uganda.

Table 19: Number and percent of adults and children enrolled in HIV care who had their TB status assessed and recorded during their last visit, 2010-2011 (WHO, 2012)

TB CARE I Country	2010		2011	
	#	%	#	%
Afghanistan				
Botswana	170	8%		8%
Cambodia			4,747	
Djibouti				
Dominican Republic	5,041	100%		
Ethiopia	43,837	79%	174,146	
Ghana	56,592	59%		
Indonesia	3,217	21%		
Kazakhstan	437	22%	547	5%
Kenya				
Kyrgyzstan			153	11%
Mozambique	87,320			
Namibia	25,478	79%	12,744	57%
Nigeria	57,082	7%	223,933	21%
South Sudan				
Tajikistan	38	4%	1,022	54%
Uganda	401,973	81%	553,057	
Uzbekistan			3,176	89%
Vietnam				
Zambia	11,961			
Zimbabwe				
Grand Total	693,146	44% (of 1,558,791)	973,695	86% (of 1,129,811)

Testing for HIV

In TB CARE I countries, 22,045 more TB patients had an HIV test result recorded in the TB register in 2011 compared to 2010 (Table 20). With 51% of TB patients having HIV test results in the TB register, slow improvements are being made (compared to 50% in 2010). However, there is a wide variation between countries, from Indonesia (1%) and Kyrgyzstan (2%) to Kazakhstan (97%) and Kenya (93%). Although some of these differences are due to country-specific policies of when to test for HIV (i.e. Indonesia only tests high-risk TB suspects and patients), strengthening of both the testing and reporting is still needed.

Table 20: Number and percent of TB patients (new and re-treatment) with an HIV test result recorded in the TB register, 2010-2011 (WHO 2012)

Countries with specific TB CARE I support in Year 2 are highlighted in bold.

TB CARE I country	2010		2011	
	#	%	#	%
Afghanistan	5,170	18%	6,445	23%
Botswana	6,147	81%	5,369	80%
Cambodia	32,236	77%	32,544	82%
Djibouti	2,163	52%	1,274	34%
Dominican Republic	2,489	60%	2,540	57%
Ethiopia	66,955	43%	65,140	41%
Ghana	10,147	67%	12,587	79%
Indonesia	2,751	1%	3,511	1%
Kazakhstan	23,854	96%	22,480	97%
Kenya	96,930	91%	97,136	93%
Kyrgyzstan	183	3%	153	2%
Mozambique	40,554	88%	41,896	88%
Namibia	9,534	76%	10,042	84%
Nigeria	71,844	79%	75,772	81%
South Sudan			3,570	47%
Tajikistan	4,049	58%	6,241	91%
Uganda	36,742	81%	39,394	80%
Uzbekistan	20,330	100%	15,913	106%
Vietnam	42,356	44%	59,176	59%
Zambia	40,704	84%	41,701	86%
Zimbabwe	41,062	86%	35,361	86%
Grand Total	556,200	50% (of 1,112,695)	578,245	51% (of 1,133,632)

Anti-retrovirals (ART) and Cotrimoxazole Preventative Therapy (CPT)

Improvements in ART use can be seen between 2010 and 2011 (Table 21). The average percentage of co-infected patients on ART rose from 39% to 49%. In general, cotrimoxazole use did not expand over this period (85% to 80% coverage), although modest improvements were seen in particular countries. Six TB CARE I countries provided technical support related to ART and/or CPT use (see bold in Table 21). In Nigeria, improvements in ART and CPT uptake among co-infected patients were considerable in part due to TB CARE I activities. In TB CARE I-supported areas, ART use improved from 39% in Year 1 to 55% in Year 2, while CPT use increased from 48% to 70% over the same time period – greater improvements than the national averages seen in the table below.

Table 21: Number and percent HIV-positive TB patients started or continued on ART and CPT, 2010-2011 (WHO 2012)

Countries with specific TB CARE I support in Year 2 are highlighted in bold.

TB CARE I Country	2010				2011			
	# on ART	% on ART	# on CPT	% on CPT	# on ART	% on ART	# on CPT	% on CPT
Afghanistan	2	100%	2	100%	4	80%	4	80%
Botswana	1,720	43%	3,172	79%	1,547	45%	2,816	82%
Cambodia	944	45%	1,383	65%	1,306	79%	1,456	88%
Djibouti	27	11%	0	0%		0%		0%
Dom. Rep.	21	4%	43	8%	430	66%	265	41%
Ethiopia	3,823	39%	6,723	69%	2,123	39%	3,348	62%
Ghana	487	18%	2,065	77%	812	28%	2,085	71%
Indonesia	325	29%	693	63%	544	43%	1,182	92%
Kazakhstan	25	8%	85	26%	32	9%	70	20%
Kenya	19,331	48%	39,952	100%	24,497	64%	37,147	97%
Kyrgyzstan	68	37%	125	68%			79	
Mozambique	6,250	25%	23,738	97%	7,661	29%	24,095	91%
Namibia	2,294	44%	4,869	93%	2,700	54%	4,885	98%
Nigeria	5,902	33%	10,415	59%	8,410	43%	13,301	68%
South Sudan					137	29%	403	85%
Tajikistan	54	54%	73	73%	66	57%	81	70%
Uganda	4,782	24%	17,855	90%	6,720	32%	19,258	93%
Uzbekistan	157	37%	394	92%	172	32%	525	96%
Vietnam	1,497	43%	2,179	62%	2,258	48%	3,396	72%
Zambia	12,646	48%	19,845	75%	14,213	53%	23,144	87%
Zimbabwe	14,223	45%	27,902	88%	14,090	67%	6,203	29%
Grand Total	74,578	39% (of 190,938)	161,513	85% (of 190,938)	87,722	49% (of 179,593)	143,743	80% (of 179,593)

Latent TB infection

Treatment of latent TB infection among HIV positive clients continues to be a challenge as does the reporting on this recommendation. Most countries (11 TB CARE I countries) do not report to WHO on this indicator because providing IPT for HIV positive patients is not yet implemented by the NTP/NAP or because the reporting system does not capture these data.

TB/HIV tools

A five-country assessment report on TB/HIV mortality data, *Counting on Us*, has been developed and will be available on the TB CARE I website by December 2012.

4.6 Health System Strengthening (HSS)

Health system strengthening is a component of 20 country workplans; four core projects are being implemented in Year 2. Although this technical area is cross-cutting and covers a wide range of activities, the program strives towards two expected outcomes:

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
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.

TB CARE I has supported the completion of strategic plans in Mozambique, Uganda and Kazakhstan (TB in prisons) this year. Technical assistance with planning and implementation of Global Fund was also provided in Ghana, Indonesia, Zimbabwe, Vietnam and South Sudan. In Indonesia, an official financial sustainability strategy was published in April 2012 with technical support from the project. The economic burden of TB was also analyzed from a providers' perspective to advocate local governments and insurance companies in Indonesia to increase their funding for TB.

Civil society in TB control

In regards to the first expected outcome, TB CARE I looks at the inclusion of civil society members and TB patient groups in Country Coordinating Mechanisms (CCM) and other coordinating bodies as

one indication of the importance of TB control in a country. At baseline and in Year 1, 15 countries had civil society or patient group members engaged in these decision-making groups. In Year 2, there are 16 countries, but after accounting for the addition of Uzbekistan, Uganda and Tajikistan in Year 2, this actually reflects a reduction of involvement in Cambodia and Indonesia where TB patients/civil society no longer participate.

Progress is being made in other avenues to engage civil society. A core project being conducted between Years 1-3 was developed to build the capacity of civil society groups as full partners in TB control. Civil society organizations (CSOs) in Nigeria (4), Indonesia (4) and Ethiopia (3) have developed and implemented their TB control activity plans. As a result, CSOs have referred TB suspects to health facilities, trained their own staff and engaged other CSOs into the TB network. *Building the Capacity of Civil Society Organizations in TB Control - An Approach*, which includes the approach, training materials, monitoring and evaluation framework, and results of the project, is now available on the TB CARE I website.

Civil Society Organizations Join the Fight against Tuberculosis in Underserved Areas of Addis Ababa, Ethiopia

In Ethiopia, civil society organizations (CSOs) have not been engaged in TB control as they have been for HIV prevention and reproductive health. In 2012, TB CARE I invited three CSOs working in the capital city of Addis Ababa to become involved in TB control activities. CSO volunteers were trained on the basics of TB and learned about the challenges of controlling the disease in their neighborhood. The participants drafted action plans outlining the role they can play in advocacy, case detection and TB education.

The three CSOs are implementing awareness raising activities, providing basic information on TB by visiting households, conducting coffee ceremonies, and giving group chats. They identify and refer people suspected of having TB, guiding them to local health facilities for diagnosis and initiation of treatment, as appropriate. In just three months since the start of activities in June 2012, the CSOs have identified and referred a total of 153 people suspected of having TB to the nearest health facilities. Of these suspects, 38 (25%) were diagnosed with TB and started on treatment.

Supervision, Training and Consultation

Supporting supervisory activities, conducting training and providing high-quality technical assistance are cornerstones of many TB CARE I country projects. Eleven countries provide moderate/substantial technical and financial assistance to NTP supervision activities and Table 22 shows the large number of TB CARE I-supported visits conducted and planned in Year 2 (70% conducted). Kenya relies heavily on TB CARE I support for the functioning of their supportive supervision activities; 21,224 visits were conducted with TB CARE I support, which is 76% of the number planned for Year 2. Data on visits planned and conducted without TB CARE I support are difficult to obtain. *(Photo: TB Control Officer in Uganda (right) mentoring a health worker on TB sputum request.)*



Table 22: TB CARE I-support supervisory visits conducted in Year 2

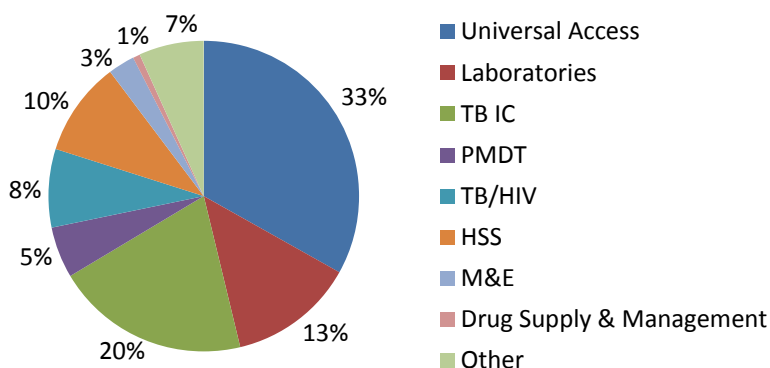
Year of Data	Year 2		
COUNTRY	# TB CARE-supported supervisory visits conducted	# TB CARE-supported supervisory visits planned	% TB CARE-supported supervisory visits conducted
Afghanistan	64	34	188%
Botswana	5	5	100%
Cambodia	393	N/A	
Djibouti	70	140	50%
Dominican Republic	13	30	43%
Ethiopia	18	20	90%
Ghana	6	6	100%
Indonesia	123	165	75%
Kazakhstan	8	8	100%
Kenya	21,224	27,897	76%
Kyrgyzstan	0	1	0%
Mozambique	13	13	100%
Namibia	8	12	67%
Nigeria	1,265	4,720	27%
South Sudan	5	4	125%
Tajikistan	0	3	0%
Uganda	9	18	50%
Uzbekistan	2	6	33%
Vietnam	17	19	89%
Zambia	10	10	100%
Zimbabwe	83	126	66%
Total	23,336	33,237	70%

TB CARE I trained 12,000 individuals (health care workers, community volunteers, consultants, NTP staff, laboratory technicians, etc.) in Year 2 across all technical areas at the country level, which is almost one thousand more than what was planned (11,063). This is also a considerable increase compared to Year 1 (4,354 trained). Table 23 and Figure 8 show the breakdown of number trained by technical area, with the greatest number being trained on UA and TB-IC. With the exception of TB-IC and the “other” trainings, more people were trained in every technical area than was planned at the beginning of the year. It is also promising to see that more than 50% of those trained were women. In addition to trainings funded through country workplans, TB CARE I also trained 187 people through core projects, including childhood TB (8), laboratory management (12), GeneXpert (106), TB-IC (16), MDR-TB (4) and patient-centered approaches (41).

Table 23: Number and percent of individuals trained with TB CARE I funds

GRAND TOTAL (All countries)	# trained males 2012	# trained females 2012	Total # trained in Year 2	Total # planned for training in Year 2	% planned for training completed in Year 2
Universal Access Laboratories	1,660	2,318	3,978	2,950	135%
TB IC	816	753	1,569	729	215%
PMDT	1,400	1,024	2,424	3,432	71%
TB/HIV	318	320	638	581	110%
HSS	507	473	980	951	103%
M&E	544	635	1,179	760	155%
Drug Supply & Management	260	71	331	294	113%
Other	60	29	89	71	
Grand Total	425	387	812	1,295	63%
Grand Total	5,990	6,010	12,000	11,063	108%

Figure 8: Percent of TB CARE I-trained individuals by technical area, Year 2



At a global level, the program has trained 28 TB-IC consultants (12 of which were mentored as well) and nine Xpert consultants. To date, 22 international consultancies on TB-IC have been carried out in Year 2 by TB CARE I trained and mentored consultants. This is a significant achievement as these visits were paid for by both external sources and TB CARE I country budgets, which is an indication that TB CARE I's reach goes beyond TB CARE I countries and fulfills a global demand. The number of completed GeneXpert consultancies will be reported on next year since this training occurred late in Year 2.

4.7 Monitoring & Evaluation, Surveillance and OR

The program implements M&E activities in 17 countries and also initiated four core projects in Year 2. TB CARE I's M&E efforts are framed by the following expected outcomes:

1. Strengthened TB surveillance
2. Improved capacity of NTPs to analyze and use quality data for management of the TB program
3. Improved capacity of NTPs to perform operations research

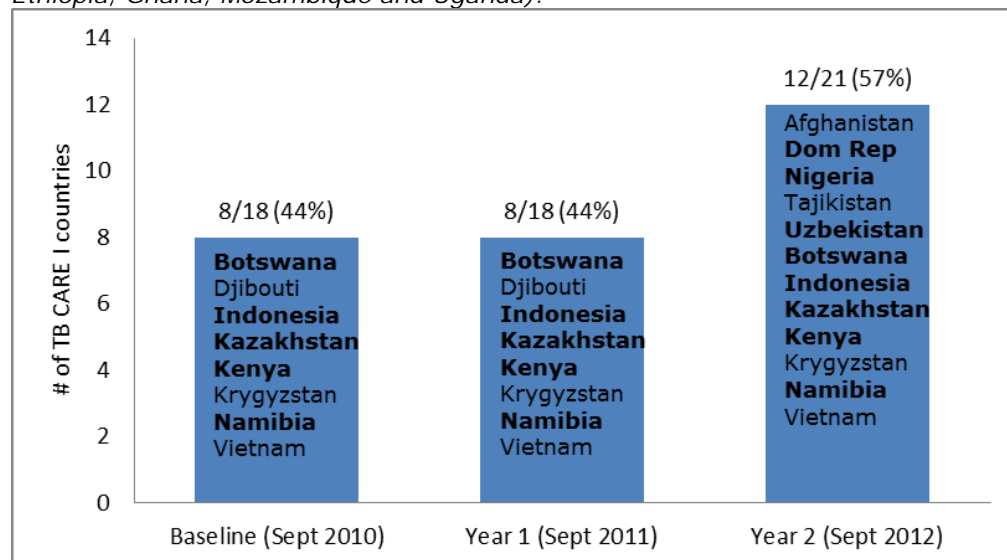
Electronic Recording & Reporting

Electronic recording and reporting (ERR) has become more important, relevant and sought after as technology becomes more available and data collection and analyses become more complex with issues like PMDT and TB/HIV integration. In Year 2, 12 TB CARE I countries (57%) now have some form of ERR for TB, compared to only eight countries (44%) last year (Figure 9). This year TB CARE I assisted the NTP in Afghanistan to roll out an ERR system in 33/34 provinces for TB. Nigeria began using e-TB manager³ this year in DR-TB diagnostic and treatment centers (see success story, page 49). Cambodia has also made progress in rolling out e-TB manager; full implementation of the system is expected in Year 3.

³ The web-based e-TB Manager system for programmatic management of drug-susceptible and drug-resistant TB integrates case management, medicine control and epidemiological surveillance into a single platform. www.etbmanager.org

Figure 9: TB CARE I countries that have an electronic recording and reporting system for routine surveillance at national and/or sub-national levels, Baseline – Year 2

Countries with specific TB CARE I support in Year 2 are highlighted in bold (support also provided in Ethiopia, Ghana, Mozambique and Uganda).



Given the increase in interest and demand for ERR, TB CARE I recognized the need for clear guidance to countries on the assessment, design and implementation of comprehensive ERR systems. The *Guide on Electronic Recording and Reporting for TB Care and Control* was developed and is now available on the WHO and TB CARE I websites.

Quality M&E systems

With a greater emphasis on showing governments and donors results, NTPs and TB CARE I have recognized the importance of quality data and strong M&E systems. A multi-year core project was started in Year 1 to foster the use of data for decision-making in TB CARE I countries. This year, 16 countries (including one TB CARE II and two Task Order 2015 countries) implemented mini-M&E plans that were developed during the Year 1 in-person training. These plans supplemented and/or dovetailed with the M&E activities in their country workplans. Mini M&E plans addressed data quality (4), feedback (5), data for decision-making (3), development of guidelines (2) and ERR (1). Eleven of these countries completed the activities laid out in their plans. A virtual Community of Practice (CoP) was also developed, bringing together all NTP and TB CARE M&E officers to exchange knowledge, ideas, questions and new experiences with each other (four 1-2 week discussion sessions were conducted).

TB CARE I countries are showing improvement in regards to measuring data quality and providing regular feedback. In Year 2, 71% of countries reported measuring some aspect of data quality compared to only 55% of countries in Year 1 and 50% at baseline (Figure 10). Countries have begun providing a greater amount of regular, written and comparative feedback from the central level to intermediate levels (86% of countries in Year 2 versus 39% at baseline and in Year 1, see Figure 11).

Figure 10: Countries that have measured data quality in the last year, Baseline – Year 2
Countries with specific TB CARE I support in Year 2 are highlighted in bold (support also provided in Afghanistan and Mozambique).

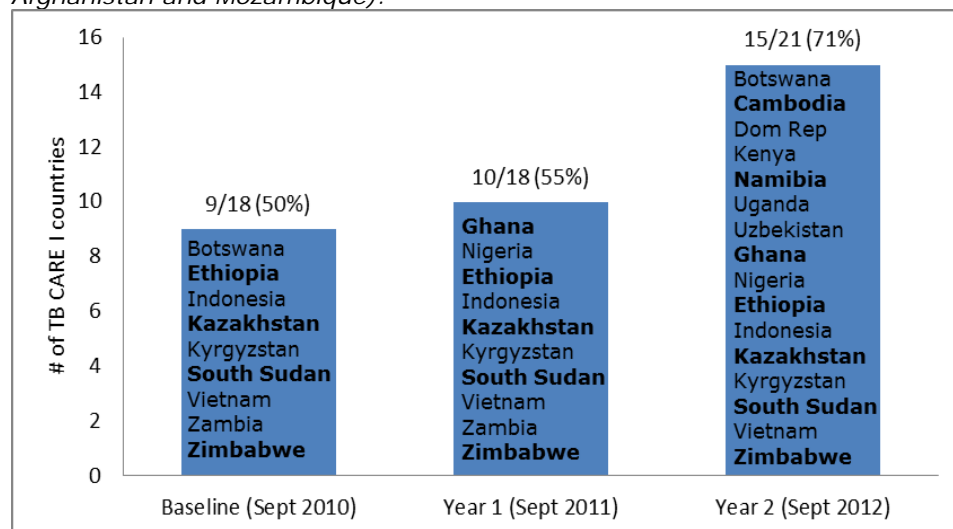
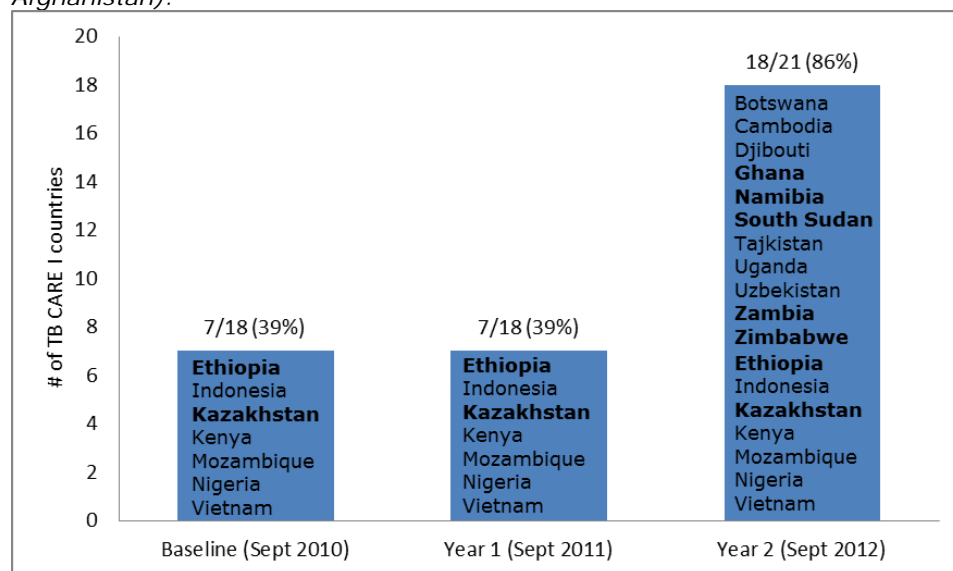


Figure 11: TB CARE I countries where the NTP provides regular written and comparative feedback from central to intermediate level, baseline – Year 2
Countries with specific TB CARE I support in Year 2 are highlighted in bold (support also provided in Afghanistan).



Also completed this year was the *Guide on inventory studies to assess the level of TB under-reporting* (publication forthcoming).

Operational Research

In Year 2, TB CARE I has been involved in operational research in 16 countries. During Year 1-2, there were more than 62 OR studies that were completed or are currently in process, with TB CARE I's level of involvement varying from major or minor financial/technical support to full implementation of the study. Eight OR studies were completed in Year 2, of which three (38%) have been disseminated (see Table 24 for a summary of these studies). Many studies are expected to be completed and disseminated in Year 3. Additional information on OR results can be found in the country-specific annual reports.

Table 24: Completed TB CARE I-supported in-country operational research studies that have been disseminated in Year 2

COUNTRY	Title of OR study	Key findings	Dissemination
Dominican Republic	Multistage model of an intervention to improve the identification and referral of people with probable TB in Health IV Area of the Dominican Republic	Implementation of the Pharmacies Model, which engages pharmacies in the detection and referral of people with TB symptoms to health care facilities, is feasible.	Published in the annual bulletin of the National Center on Mother and Child Health (CENISMI), Dec. 2012.
Ghana	Assessing provider delay from routinely collected TB data from TB treatment registers in the Eastern Region, Ghana	Treatment delay (i.e. time from sputum examination to start of TB treatment) ranged from 5-31 days, which was above the accepted treatment delay of 4 days.	Reports to USAID and NTP; Eastern Region quarterly review meeting; annual national review meeting (January 2013)
South Sudan	Effectiveness of the referral mechanism in Juba County, South Sudan	The primary defaulter rate for confirmed TB cases between the Juba Teaching Hospital (JTH) laboratory and referral facilities is high (32%, 22/69 patients). 48% of diagnosed patients (33/69) were enrolled for treatment at JTH, while 20% were successfully referred and started on treatment elsewhere.	NTP organized a meeting for TB unit healthcare workers in Juba to discuss results and possible interventions to minimize the primary defaulter rate.

Prevalence and drug resistance surveys

In Ethiopia the TB prevalence survey field operation was successfully completed in June 2011, after 12 months of fieldwork, which was supported technically by TB CARE I (Year 1). The prevalence of smear positive TB among the total Ethiopian population (including children) was estimated to be 61/100,000 (95% CI: 44-81), which is three times lower than the 2008 indirect estimate (284/100,000). A dissemination workshop was conducted in December 2011 at which TB CARE I was awarded a certificate of recognition for its exemplary partnership and support.

The fieldwork for the prevalence survey in Pakistan was successfully completed by March 2012 without any significant security incidents, which is a major accomplishment in this country. Preliminary results have been presented, which indicate that the prevalence of definite pulmonary TB cases in Pakistan is 295/100,000 adult population; this is lower than the 350/100,000 (158-618) indirect estimate (WHO report 2012), but still within the 95% confidence interval. Final quality assured results are expected during Year 3. *(Photo: Prevalence survey results sharing ceremony.)*



Technical assistance was provided for the preparation of prevalence surveys in Indonesia and Zambia for implementation during Year 3. Technical support was also provided in Cambodia, Indonesia and Zimbabwe for drug resistance surveys.

Other highlights

In Year 2, TB CARE I began piloting an innovative approach to analyze human resource (HR) and TB data in Ethiopia. By mapping human resource gaps at the sub-national level, the NTP will be more equipped to easily identify gaps in HR and service provision and thus develop more comprehensive training plans and approaches for strengthening HR capacity at the sub-national level. Results are expected in Year 3.

TB CARE I financially and/or technically supported an NTP review in Cambodia, Ghana, Nigeria and Zimbabwe during Year 2.

NTP of Nigeria launches web-based tool for information management of drug-resistant TB

The NTP of Nigeria with support from TB CARE I successfully commenced the piloting of an electronic web-based tool for management of drug resistant tuberculosis (DR-TB). The pilot which started in June 2012 is currently implemented across six DR-TB diagnostic and treatment facilities in the country. The web-based tool known as e-TB Manager “provides information that enables integration of all aspects of TB and DR-TB control, including surveillance of suspects, case diagnosis and follow-up, treatment monitoring and outcomes, 1st and 2nd line TB medicines management, and production of reports aligned with WHO recommendations in one platform”.³ The web-based nature of the tool allows for real time information that can facilitate timely programmatic decision making.

e-TB Manager was developed by “MSH in partnership with the Ministry of Health of Brazil where it has been institutionalized as the national tool for management and surveillance of DR-TB. Specific versions of the tool have been developed and rolled out to 15 countries in the Caribbean, East Europe, Central and Southeast Asia, and Africa”.³ The generic tool was customized to suit the national guidelines and procedures for the management of DR-TB in Nigeria. The customization process involved adaptation of the fields and functionalities of the tool leading to the development of the e-TB Manager Nigeria work space. The tool has been deployed and is currently in use in four hospitals. *(Photo: Health workers in Nigeria entering data on e-TB manager.)*



Commenting on the pilot, the National Coordinator, Dr. Joshua Obasanya, noted that “e-TB Manager will improve the surveillance of DR-TB in the country by enhancing access to data, data quality, and timeliness of reporting. Ultimately, easier and faster access to quality data will facilitate analysis of the data and inform evidence-based decision making for the management of DR-TB in the country.” The pilot is expected to be completed by November 2012. Thereafter the pilot will be evaluated, the tool will be adjusted according to the results of the pilot and a plan established for the roll out of e-TB Manager nation-wide.

The demo version of e-TB Manager can be found at www.etbmanager.org. A user will be required to register and will then receive a temporary password to use the tool.

³ - www.etbmanager.org

4.8 Drug supply and management

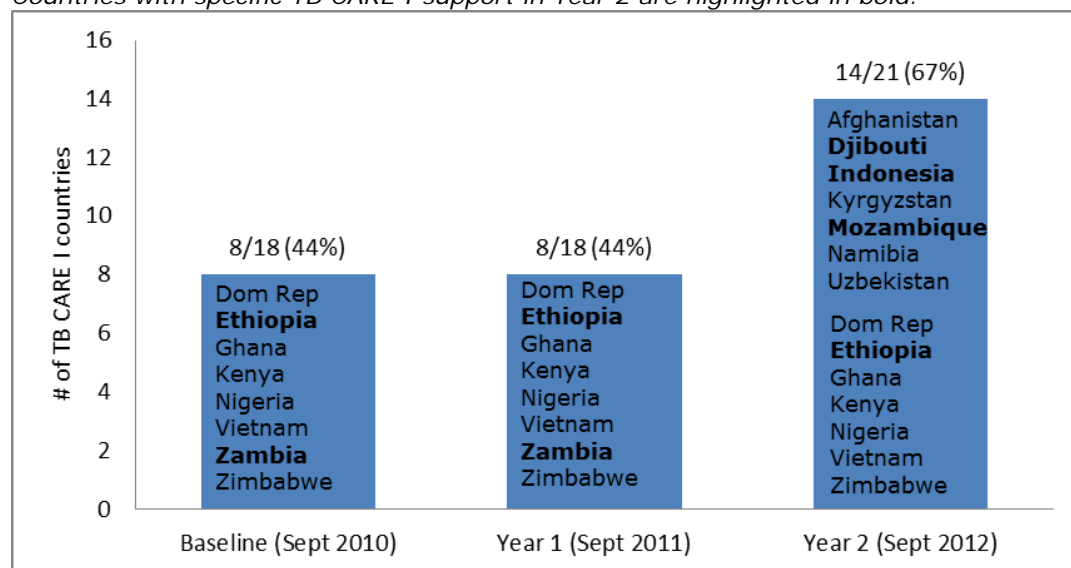
TB CARE I provides technical assistance to NTPs in six countries to ensure there are nationwide systems for a sustainable supply of drugs. There are no regional or core projects on drug management as global projects are covered by other global USAID-funded programs such as the Systems for Improved Access to Pharmaceuticals and Services Program (SIAPS). National forecasts for first and second line drugs for next 2013 have been conducted in all TB CARE I countries, except for Cambodia where forecasting is managed by the MOH and was not yet available.

Substantial improvements were seen in the number of countries with updated Standard Operating Procedures (SOPs) for selection, quantification, procurement, and management of TB medicines (Figure 12). Compared to baseline and Year 1 (8 countries), SOPs are now available in 14 TB CARE I countries, including two countries where TB CARE I assisted in the development/update of the document (Indonesia and Mozambique).

In Indonesia, TB CARE I supported the NTP to develop standard operating procedures to address Global Fund-mandated TB quality assurance processes at the Port of Entry, which has cross-program relevance. Also, to ensure optimal storage conditions for SLDs once in country, TB CARE I helped the NTP to identify and contract a third party storage facility for SLDs.

Figure 12: Updated SOPs for selection, quantification, procurement, and management of TB medicines available, Baseline – Year 2

Countries with specific TB CARE I support in Year 2 are highlighted in bold.



5. TB CARE I and Knowledge Exchange

TB CARE I prioritizes the compilation and dissemination of lessons learned, TB information, project results and research for the TB community and a wider audience to use. Below is a list of tools or publications that have been developed and released in Year 2, all of which can be found on the TB CARE I website (www.tbcare1.org):

- Ndola TB-IC Demonstration Project Job Aid & Tools
- Guidelines to Measure the Prevalence of Active TB Disease Among Health Care Workers
- A Strategic Guide for Building Public Private Mix Partnerships to Support TB Control
- Electronic Recording and Reporting for Tuberculosis Care and Control
- TB-IC at Community Level - Training Handbook (English/French/Portuguese)
- Refresher (Advanced) Training Course & Workshop on TB-IC for Consultants
- TB CARE I - Newsletter 2
- TB CARE I - Newsletter 3
- TB CARE I Focus - World TB Day 2012