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TUBERCULOSIS PROGRAM SOUTH AFRICA

FINAL REPORT

2009-2015

The USAID TB Program South Africa (2009-2015) worked closely with the South African National Department of Health (DOH) and other stakeholders to support the government's health sector reform through the expansion of quality and accessible TB services. In addition, the project worked with provincial and district health departments in the development, implementation, and evaluation of needs-based strategies to combat TB, TB/HIV, and drug-resistant TB (DR-TB), and to promote best infection control practices. This support also helped communities create appropriate advocacy, social mobilization, and health systems strengthening and innovate service delivery models for the rapid expansion of Directly Observed Treatment Short course (DOTS) for the control of TB.

The USAID TB Program South Africa was implemented by prime contractor University Research Co., LLC (URC), with partners the International Union against TB and Lung Disease, Health Systems Trust, the Johns Hopkins Health and Education South Africa (JHHESA), BEA Enterprises, and Karensoft Consulting Group.

Photos in this report taken by Tebogo Kekana and the USAID TB Program staff.

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FINAL REPORT

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Acronyms

5Is	Intensified case finding, Isoniazid preventive therapy, Infection control, and Integration and Initiation of antiretroviral therapy
ACSM	Advocacy, Communication and Social Mobilization
AIDS	Acquired Immunodeficiency Syndrome
ART	Antiretroviral Therapy
ARV	Antiretroviral treatment
BC	Bacteriological Coverage
CAT	Community Action Team
CBO	Community-Based Organization
CBS	Community Based Services
CCMT	Comprehensive Care Management and Treatment
CCW	Community Health Care Workers
CDC	Center for Disease Control
CHC	Community Health Centre
COPC	Community Oriented Primary Care
c-PMDT	Community Programmatic Management of Drug-resistant TB
CPT	Co-trimoxazole Preventative Therapy
CSIR	Council for Scientific and Industrial Research
CWD	Cape Winelands District
DHIS	District Health Information System
DOH	Department of Health
DOL	Department of Labour
DOT	Directly Observed Treatment
DOTS	Directly Observed Treatment Short-course
DRAT	District Rapid Assessment Tool
DRS	Drug Resistant Survey
DR-TB	Drug Resistant Tuberculosis
DS-TB	Drug Susceptible TB
DST	Drug Susceptibility Testing
DTTC	Desmond Tutu TB Centre
DVE	Data Verification Exercise
EC	Eastern Cape Province
EDR	Electronic Drug Resistance Register
ETR	Electronic TB Register
F4L	Footballers for Life
FBO	Faith Based Organization
FDIC	Facility diagnostic information collection
FS	Free State Province
GP	Gauteng Province
GXP	GeneXpert
HAST	HIV, AIDS, and Sexually Transmitted Infections and TB
HCT	HIV Counselling and Testing
HCW	Health Care w Worker
HIV	Human Immunodeficiency Virus
HOSPERSA	Health & Other Services Personnel Trade Union of South Africa
HSS	Health Systems Strengthening
HST	Health Systems Trust
IC	Infection Control
ICF	Intensified Case Findings
IEC	Information, Education, and Communication
IPT	Isoniazid Preventive Therapy
IR	Intermediate Results
JHHESA	John Hopkins Health and Education South Africa
KZN	Kwa-Zulu Natal Province
LDIC	Laboratory Diagnostic Information Collection
LOP	Life of Project
LP	Limpopo Province
M&E	Monitoring and Evaluation
MDR-TB	Multi-drug Resistant Tuberculosis
MIS	Management Information System
MOU	Memorandum of Understanding
MPU	Mpumalanga Province
NC	Northern Cape Province
NDOH	National Department of Health
NEC	National Expansion Coordinator
NGO	Non-Governmental Organization
NHLS	National Health Laboratory Service
NMBHD	Nelson Mandela Bay Health District
NSDA	Negotiated Service Delivery Agreement
NTCP/ NTP	National Tuberculosis Control Program
NW	North West Province
OR	Operational Research
PEPFAR	President's Emergency Plan for AIDS Relief
PHC	Primary Health Care
PMDT	Programmatic Management of DR-TB
PMTCT	Preventing Mother to Child Transmission
PPM	Public-Private Mix
PSA	Public Service Announcement
PTB	Pulmonary Tuberculosis
QA	Quality Assurance
QI	Quality Improvement
SABCOHA	South Africa Business Coalition
SADC	Southern African Development Community
SAG	South African Government
SCR	Smear Conversion Rate
SND	Smear Not Done
SO	Strategic Objectives
SS+	Smear Positive
STI	Sexually Transmitted Infections
TAT	Turn Around Time
TB	Tuberculosis
The Union	International Union against Tuberculosis and Lung Disease
THP	Traditional Health Practitioners
THP	Traditional Health Practitioners
TOT	Training of Trainers
TSR	Treatment Success Rate
URC	University Research Co., LLC
USAID	United States Agency for International Development
VCT	Voluntary Counselling and Testing
WAD	World AIDS Day
WC	Western Cape Province
WHO	World Health Organization
XDR-TB	Extensively Drug-Resistant TB

Executive Summary

South Africa has the third highest number of new tuberculosis (TB) cases in the world, with 860 incident cases per 100,000 population. In 2013, there were approximately 330,000 TB cases notified in 2013. The TB epidemic in South Africa is mainly driven by HIV: 60-65% of incident TB cases are co-infected with HIV. TB still remains the leading cause of death among people living with HIV/AIDS (PLHIV). The country is also among the high multidrug resistant TB (MDR-TB) burden countries, with 1.8% among new and 6.7% among retreatment cases.

The USAID TB Program supported the government of South Africa since 2009-2014 in all spheres of the National Department of Health (NDOH); national, provincial, district and sub district. The geographic scope of the project included support to all nine provinces, with direct support to 24 of 52 (46%) priority districts across the country, particularly those with the highest burden of TB and vulnerable populations with limited access to services. The overall goals of the USAID TB Program was to assist the NDOH to increase availability of TB services, improve the quality of TB services, increase demand for TB services and design innovative models to improve service delivery at facility level and community levels through 75 funded non-government organizations (NGOs) and public private partnerships. The USAID TB Program implementation principles were guided by the NDOH strategies such as the National Strategic Plan on HIV, STIs, and TB (2007-2011), later (2012-2016) and the NDOH Negotiated Service Delivery Agreement (NSDA) output 3 which is "combating HIV and AIDS, decreasing the burden of disease from tuberculosis to realize the SA Governments vision in the NSDA of "a long and a healthy life for all South Africans" as well as the STOP TB strategy.

Drug resistant tuberculosis (DR-TB) is a global public health crisis that threatens to undermine TB control efforts in many countries. South Africa currently has the fifth highest burden of MDR-TB in the world, with 15,400 diagnosed cases in 2012. Approximately 10% of these MDR-TB cases were reported to have extensively drug resistant TB (XDR-TB). The USAID TB Program South Africa has been supporting the NDOH in combating DR-TB in the country through expanding access to diagnostics, improving programmatic management of MDR-TB at community level, and increasing provider capacity at all levels to implement DR-TB programs. To improve TB diagnostics, the USAID TB Program South Africa partnered closely with the NDOH to facilitate the GeneXpert roll out in March 2011. Through substantial political support and government investment, South Africa now has 289 GeneXpert machines placed throughout the country. The USAID TB Program South Africa trained 916 technical and 3968 clinical staff on the use of the GeneXpert machines. The decentralization of the DR-TB program supported by the USAID TB Program has resulted in an increased number of patients on treatment. To provide support for those patients who fail treatment, the USAID TB Program, in consultation with the NDOH, developed a strategy to promote palliative care for incurable MDR/XDR-TB patients.

The USAID TB Program has been successful in steadily scaling up ART uptake across its 24 supported districts and sub-districts. ART uptake among co-infected TB/HIV patients in project-supported districts rose from 43.0% in January-March 2012 to a high of 72.6% in April-June 2014. To promote case detection and treatment of TB among children, the project launched a campaign to raise awareness of the issue of childhood TB, as well as provided tools to health care workers to help them screen, identify, and treatment pediatric TB cases.

The USAID TB Program South Africa managed a robust portfolio of advocacy, communication, and social mobilization (ACSM) activities to raise awareness on TB-related issues and increase demand for TB services supported by community-based organizations funded throughout the country. The project supported mass media campaigns through TV public service announcements (PSAs); TB messaging through popular TV shows and radio dramas; radio PSAs; radio talk shows and interviews; dissemination of periodical

press releases to newspapers, journals, magazines, and other publications; and Information, Education, and Communication (IEC) materials such as pamphlets, fact sheets, and posters, widely distributed to health facilities, NGOs, faith based organizations (FBOs), sports clubs, health facilities, schools, taxi ranks, bus stops and libraries.

The project used mass media to raise awareness on the symptoms of TB and HIV to the general public, encourage them to test early, and ultimately reduce transmission of TB through proper infection control. TB PSAs aired on TV and radio to reach wide general audiences with TB messages. Over the life of the project, 72% of black South African adults ages 16-64 and 62% of children ages 5-14 have been reached by TV PSAs, while 64% of adults and 49% of children have been reached by radio spots. In partnership with the NDOH, the USAID TB Program South Africa developed a national TB awareness campaign called "We Beat TB." The campaign targeted adult South Africans ages 16-64 and school aged children. Promotion materials featuring the "We Beat TB" campaign brand are distributed at community mobilization activities, health education sessions, and national events such as World TB Day and World AIDS Day.

To improve TB prevention and expand DOTS in communities, the USAID TB Program South Africa awarded 91 grants to 75 community-based organizations throughout South Africa's nine provinces. Grants were given to local community-based organizations (CBOs) and FBOs with the purpose of building their capacity in TB prevention and support. Park Homes were procured and installed to be used as an addition to existing health facilities in Eastern Cape, KwaZulu-Natal, and Mpumalanga to improve the infrastructure capacity to deliver quality TB services. The park homes addressed implementation challenges such as high case load and improve infection control and improve integration of TB/HIV services.

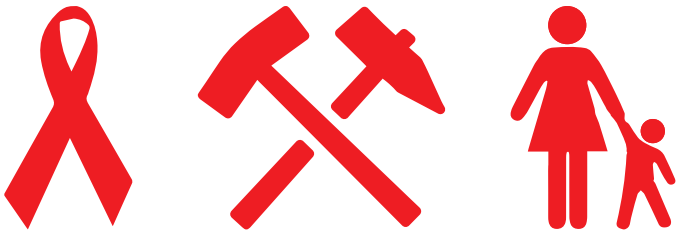
The USAID TB Program South Africa adopted a public-private mix (PPM) approach to addressing TB and expanding DOTS in the private sector through engaging traditional health practitioners (THPs). THPs were capitated in supporting active case finding, identifying TB symptoms early and refer timeously to health facilities in Limpopo, KwaZulu-Natal and Free State. South Africa's more than 500,000 mine workers currently have the highest rates of TB in the world, and most of these miners are migrant workers from neighbouring countries, (Lesotho, Mozambique, and Swaziland), resulting in a huge threat of cross-border spread. The USAID TB Program's support for improving TB services within the mining sector focused on developing lasting multi-sectoral partnerships geared to promote advocacy and consensus building among mine operators, mine health services, mine laborer's representatives, and district department of health on practical steps to implement the objectives within the declaration on TB in the Mining Sector, a legal instrument, signed by 15 heads of state at the Summit Meeting of the Southern African Development Community (SADC) in August 2012.

Summary of Key Achievements

Contributed to **better TB outcomes**, in terms of improved treatment success rates, loss to follow-up rates, and TB screening among HIV patients in project-supported districts.

Awarded 91 grants to 75 community-based organizations throughout South Africa's nine provinces and worked with these organizations to build their capacity to sustain the ongoing fight against TB.

Trained **19,167 HCWs** including **917 doctors** on basic TB management, MDR-TB, and TB/HIV

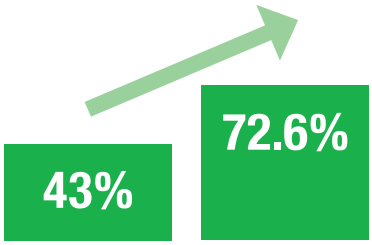


Expanded access to TB services among vulnerable and hard-to-reach populations, including people living with HIV, mine workers, and children.

Involved private-sector partners in TB control efforts, which led to more than **11,033 CASES** cases of TB being diagnosed by the non-DOH sector

Supported decentralization of the DR-TB treatment programs throughout the country, resulting in an **increased number of DR-TB patients on treatment**.

Increased ART uptake among co-infected TB/HIV patients in project-supported districts



Introduction

Context and Program Rationale

Globally, more than nine million people become ill with tuberculosis (TB) each year, and more than 1.5 million die of the disease. South Africa is classified by the World Health Organization (WHO) as a high burden TB, HIV and multi-drug resistant TB (MDR-TB) country. The country has the world's third highest TB burden, with nearly half a million incident cases each year (or approximately one out of every 100 South Africans). Two-thirds (60-65%) of tested TB patients are found to be HIV-positive and South Africa has some of the highest incidence of MDR-TB and extremely-drug resistant TB (XDR-TB) in the world. The USAID TB Program South Africa was a 5-year project (2009-2014) implemented by University Research Co., LLC (URC). This project built on the successes of the previous USAID TASC II TB Project (2004-2009), also implemented by URC.

Program Goals and Objectives

The USAID TB Program South Africa supported the National Department of Health (NDOH) in improving early case detection, increasing access to diagnostics, ensuring treatment support for patients on TB treatment and ensuring that there was provision of appropriate and timely HIV care for TB patients and ART treatment for all TB/HIV co-infected patients. The USAID TB Program developed multi-level support, working closely with the National TB Control Program (NTP) to build national support by mobilizing resources and creating a conducive environment for expansion of TB services, as well as, with provincial and district health departments to support the collaborative development of need-based strategies to combat TB, TB/HIV and drug resistant (DR) TB, and with communities to create appropriate social mobilization and service delivery models for rapid expansion of directly observed treatment short-course (DOTS) in the country.

Expected results from this program included:

- A national TB treatment success rate of 80%.
- Improved capacity to plan and implement TB DOTS at community, facility, district, municipality, provincial and national levels.
- Improved surveillance system resulting in early detection of TB cases, MDR-TB cases, co-infected patients for ART as well as to prevent treatment defaulters and reduce mortality.
- Improved understanding and support among the general population regarding TB and TB/HIV signs, symptoms, referral, and treatment.

The project results framework is outlined in Figure 1.

Geographic Scope

The project worked nationwide, providing support to all nine provinces, with direct support to 24 of 52 (46%) priority districts across the country, particularly those with the highest burden of TB, as illustrated on the map in Figure 2.

Figure 1. USAID TB Program South Africa Intermediate Results Framework

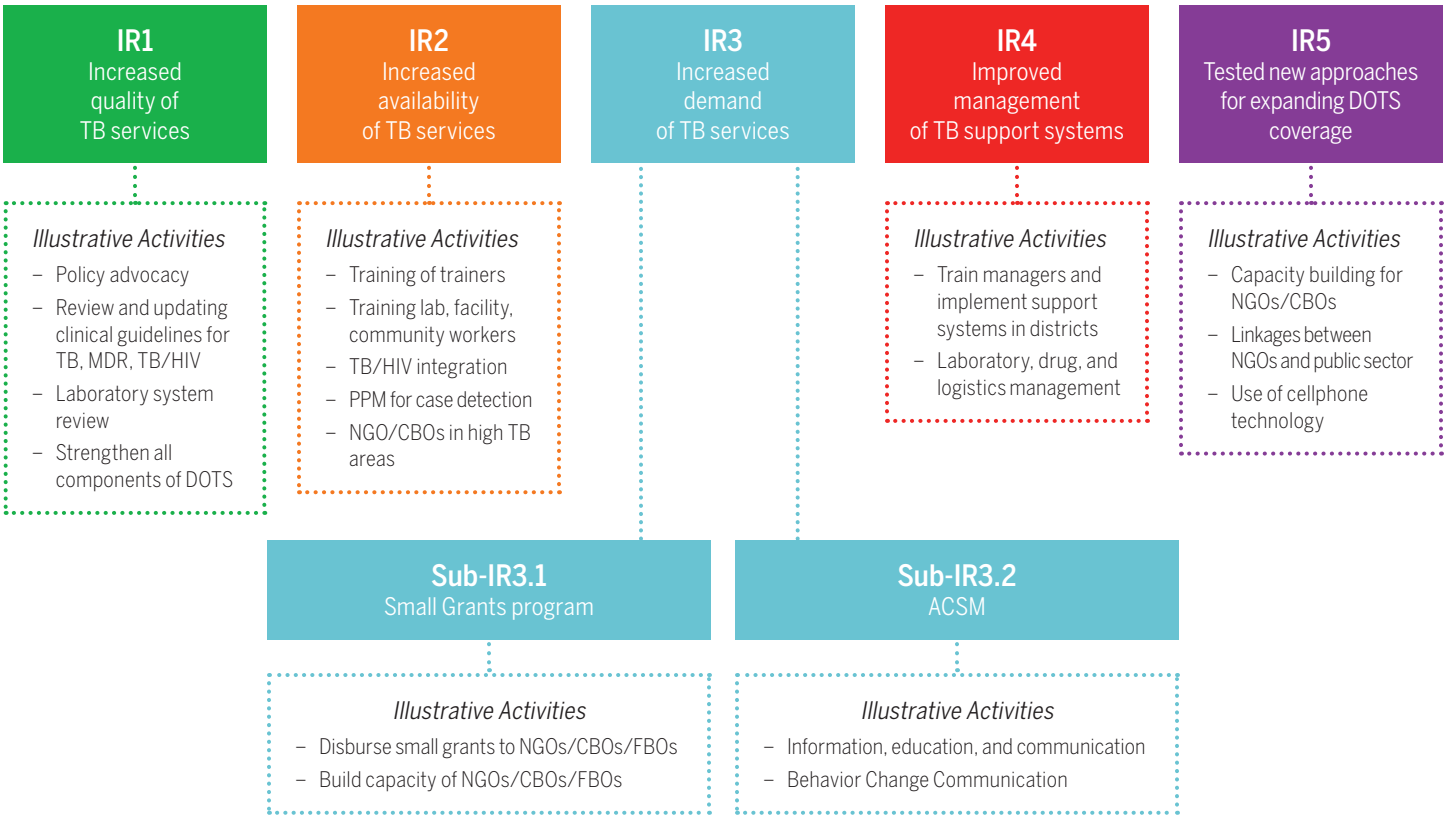
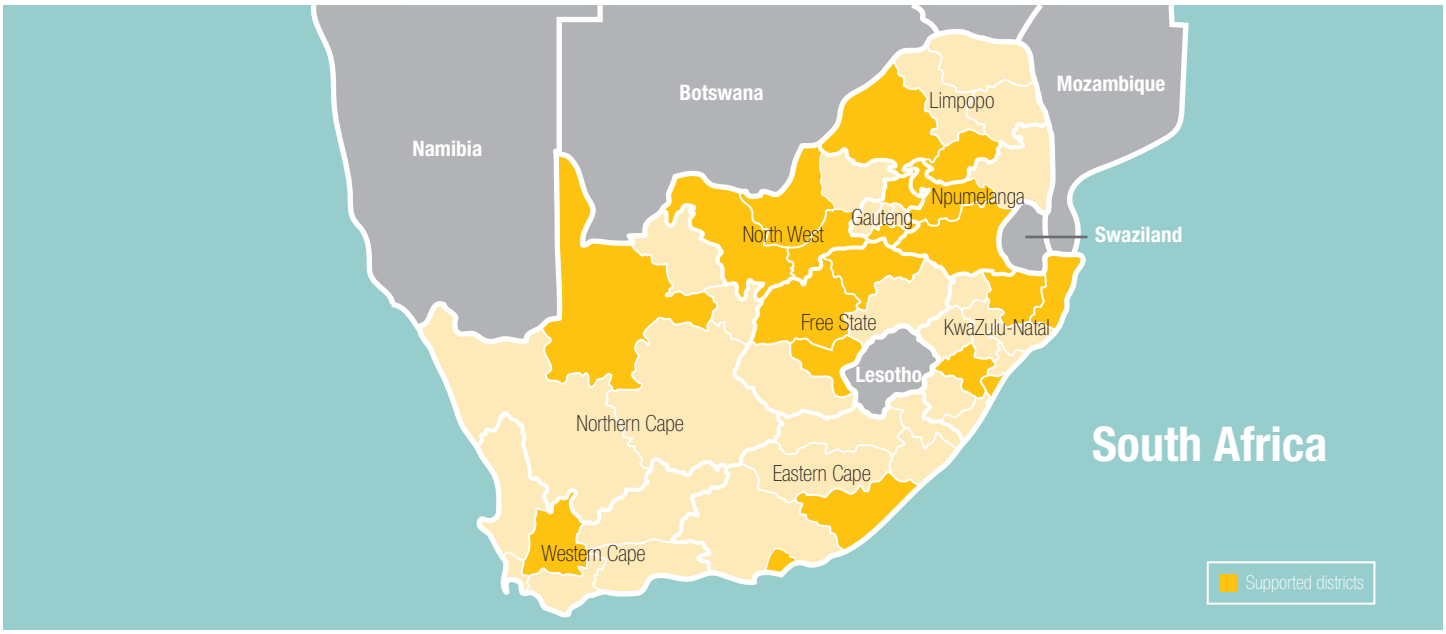


Figure 2. USAID TB Program South Africa Allocated Districts by Province



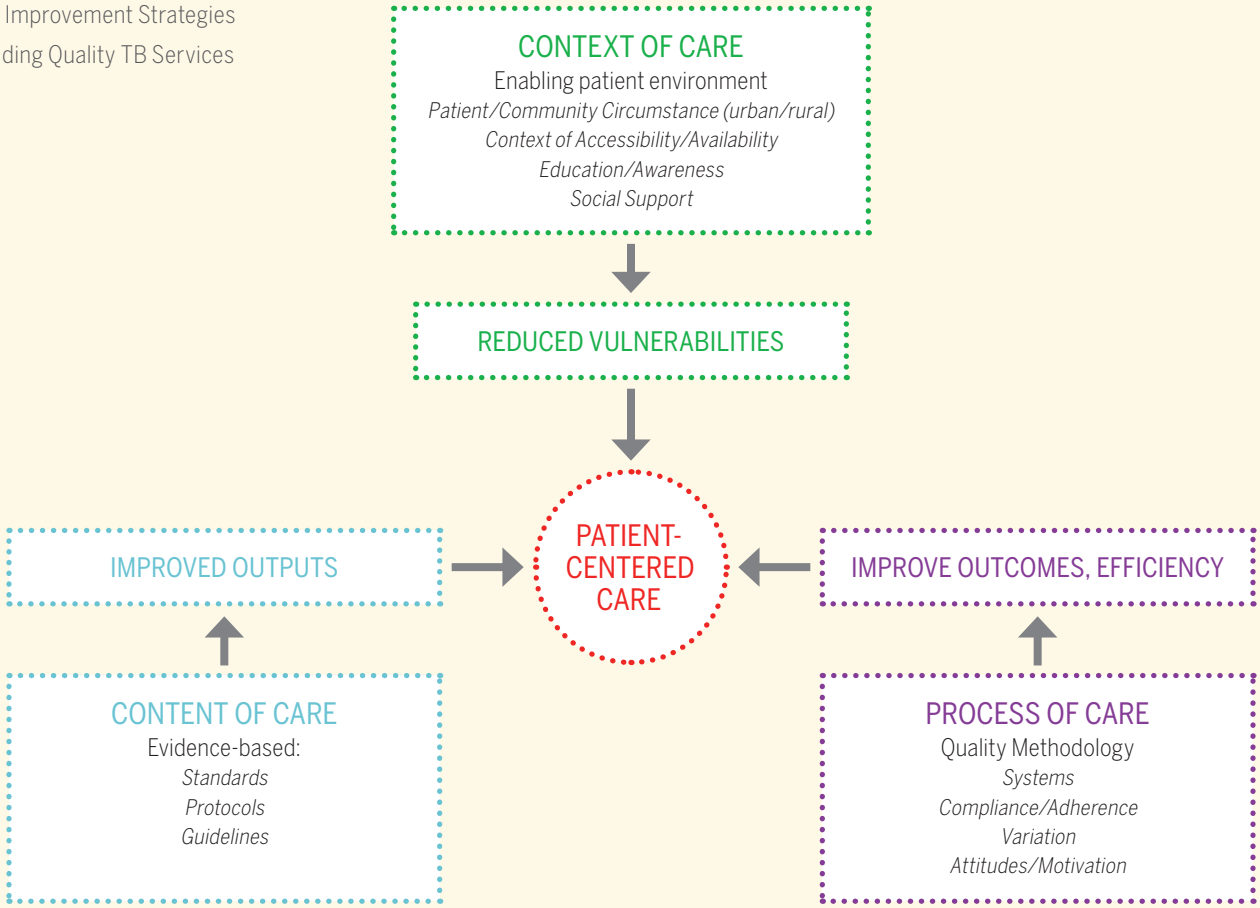
Technical Approach and Key Implementation Strategies

Support for the Stop TB strategy: The USAID TB Program South Africa assisted the NDOH to implement and actualize the six components of the Stop TB strategy, which included 1) pursuing high-quality DOTS expansion and enhancement; 2) addressing TB/HIV, MDR-TB, and the needs of poor and vulnerable populations; 3) contributing to health systems strengthening (HSS) based on primary health care (PHC); 4) engaging all care providers; 5) empowering people with TB, and communities through partnerships; and 6) enabling and promoting research. Since it was adopted in May 2014, the TB Program has also supported the NDOH to work toward the post-2015 Stop TB strategy to reduce TB deaths by 95% and cut new cases by 90% by 2035.

Patient-centered care: The USAID TB Program South Africa worked to improve the content of care, through development of and training on evidenced-based national guidelines and treatment protocols; the process of care, through quality improvement (QI) strategies designed to increase the efficiency and effectiveness of systems; and the context of care, through support for community-based social support and counseling services.

Working as a hand-in-glove technical assistance partner to the DOH: The USAID TB Program South Africa sought to build the long-term capacity of the DOH to effectively and sustainably implement its National TB Control Programme. The project received unprecedented acclaim, praise, and recognition for its strong relationship building and close collaboration with the DOH at all levels. Notably, in the 2014

Figure 3. Improvement Strategies for Expanding Quality TB Services



"URC was widely applauded for their high level of technical expertise in TB, bottom-up approach, responsiveness, and support to the DOH, both in capacity building and skills transfer as well as in systems building."

– *USAID Evaluation Report 2014*

USAID Program Evaluation, 100% of DOH respondents praised the project for its close and collaborative relations with the DOH, as well as its bottom-up approach. In many emerging areas of TB, the USAID TB Program worked to expand the national dialogue among key stakeholders. This included support for the national TB Think Tank, hosting a National Diagnostics Summit, and many others.

Decentralized treatment: TB Program South Africa promoted the NDOH policy directive, a shift away from clinically-focused, hospital-based MDR-TB treatment toward programmatic management and community-based care for MDR-TB patients. This model reduces hospital caseloads and delays in treatment initiation, reduced inpatient costs, and allows patients to receive sustained family and community support during their treatment.

Vulnerable populations: The USAID TB Program worked with DOHs to expand services to specific vulnerable and hard-to-reach groups. This included expanding services in large townships, developing strategies to reach workers in the mining sector, addressing the issue of TB among women and children, and funding one of the program's small grantees to address TB in prisons.

Innovations: The USAID TB Program introduced a number of innovative evidence-based tools for improved patient as well as program management. The USAID TB Program piloted mHealth applications for identifying clustering of TB/MDR-TB patients and also developed a module for MDR-TB patient management that will be rolled out as part of the proof of concept. Since March 2011, the USAID TB Program has supported the NDOH in its nationwide roll-out of Xpert MTB/Rif testing as the first-line test for all suspected TB cases.

Operations Research: The USAID TB Program supported the design of targeted research to help answer key operational questions to improve TB management systems. For example, the project funded the Desmond Tutu TB Centre to evaluate how to improve TB case reporting among children.

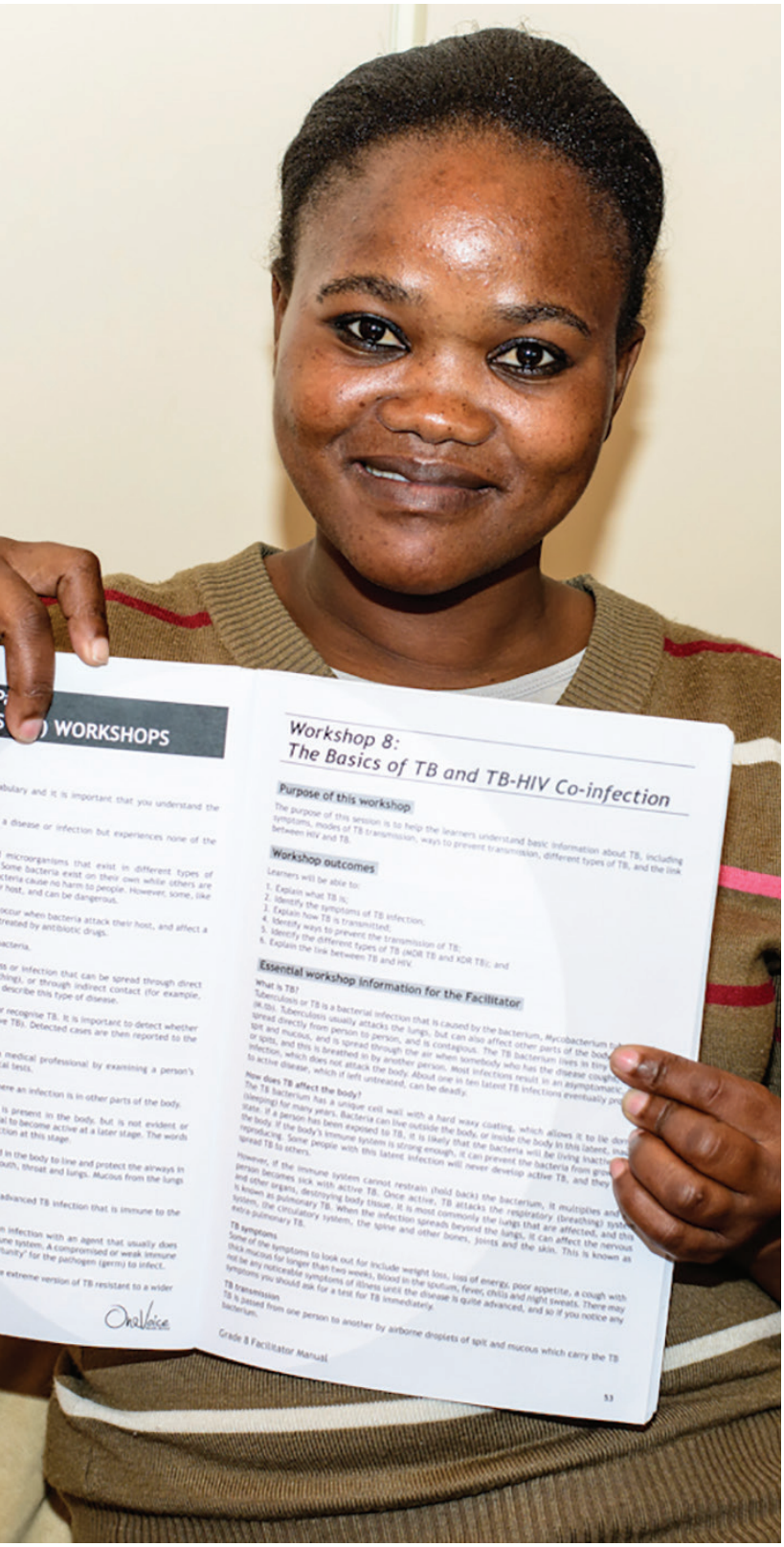
Program Focus Areas

Improving the Quality of TB Services

- Working with the NDOH, provinces, districts, and other stakeholders to develop and implement strategic interventions that address the threats of TB, TB/HIV, and DR-TB.
- Jointly reviewing and update clinical and programmatic guidelines for TB, TB/HIV, and drug-resistant TB.
- Reviewing laboratory systems at all levels of intervention, by conducting needs assessments, mapping TB microscopy diagnostic centers countrywide, and addressing laboratory challenges.
- Continuing efforts to strengthen the six components of the expanded STOP TB strategy.
- Conducting operational research (OR) on programmatic aspects of the project jointly with institutional partners.

Increasing the Availability of TB Services

- Providing need-based training and mentoring for managers and health care staff at all levels of the system on basic TB management; TB/HIV, including the national 5 I's (intensified case finding, isoniazid preventive therapy, infection control, and integration and initiation of antiretroviral therapy, or ART); programmatic and clinical management of DR-TB; laboratory diagnosis of TB and DR-TB; and advocacy, communication, and social mobilization (ACSM).
- Introducing quality improvement (QI) methods to facilitate implementation of TB/HIV health care services from provincial to facility levels as per WHO recommendations and through innovative models.



- Assisting provinces, districts, and community partners in implementing the national strategy for decentralization of DR-TB management.
- Expanding the available DOTS system in high burdened rural, urban and peri-urban communities through community-based active case finding strategies.

Increasing Demand for TB Treatment

- Promoting and participating in the implementation of the national ACSM policy through national events (i.e., World AIDS and TB days, Youth Day, TV and radio public service announcements), local activities (e.g., community dialogues, community activations, Kick TB campaign, "We beat TB campaign"), and distribution of materials (e.g., pamphlets, posters, lap desks with TB messages for school children).
- Disbursing grants to and building the capacity of nongovernmental and community/faith-based organizations to expand community-based TB, TB/HIV, and MDR-TB and XDR-TB TB management.

Improving Management of TB Support Systems

- Strengthening TB information systems through conducting regular data verification exercises and developing improvement plans.
- Jointly analyzing reports and linking them to facility case management.
- Improving supportive supervision and surveillance through trainings and facility mentoring and couching.
- Strengthening linkages between health facilities and laboratory networks.

Testing and Scaling up New Approaches for Expanding DOTS Coverage

- Supporting the expansion of TB diagnostics, particularly rapid molecular testing methods, (GeneXpert MTB/Rif®-GeneXpert).
- Identifying and supporting TB and TB/HIV PPM strategies and interventions.
- Disseminating the use of geographic information system (GIS) technologies to map laboratories, health facilities, treatment supporters and households for better TB control including DR-TB.

Project Activities and Key Results

IR 1: Increase Quality of TB Services

Policy and Guidelines

USAID TB Program South Africa has assisted the NDOH in making a number of improvements to national TB policies and guidelines to improve access to and use of health services and improve management of TB in health facilities. As technical assistance partner to the DOH, the USAID TB Program South Africa designed a number of tools and toolkits to assist facility managers, health care workers, and community health workers to deliver high quality TB prevention, diagnosis, and treatment services. Many of the tools have been formally adopted and disseminated by the DOH, and are being used by partner organizations throughout the country. These tools include the GeneXpert Training Manual, Clinical DR-Training Manual, TB and DR-TB Patient Registers, Traditional Health Practitioners Screening and Referral Tool, TB Screening Tool for Adults and Children, TB/HIV Facility Data Collection Tool, DR-TB Treatment Care, IPT Patient Treatment Card, and Daily TB Diary.

Diagnostics

Lack of diagnostic capacity has been a significant barrier in preventing an effective response to TB epidemic worldwide. According to the WHO Global Tuberculosis Report 2012, "a high-quality laboratory system that uses modern diagnostics is a prerequisite for early, rapid and accurate detection of TB". Inadequacies in laboratory capacity in many low and middle income countries have been cited as part of the reason why only 66% of the estimated 8.7 million TB cases in 2011 were diagnosed and notified by national TB control programs. The USAID TB Program supported the NDOH to expand access to rapid, high-quality diagnostics so that TB patients are initiated on treatment sooner, raising their chance of being cured and reducing the risk of spreading TB to others.

Mapping and Identifying Gaps in Laboratory Systems

The USAID TB Program South Africa undertook a desk survey in 2010 to identify preliminary challenges with the country's laboratory system. Some of the challenges identified included prolonged sputum turn-around time (TAT), problems in cold chain maintenance during the transportation of specimens and insufficient access to laboratories by the clinics and screening sites. The next year, 2011 in partnership with the National Health Laboratory Service (NHLS), the program mapped all the TB microscopy diagnostic centers in the country to determine the coverage of TB laboratory services. The program also developed a facility diagnostic information collection (FDIC) tool and a laboratory diagnostic information collection tool (LDIC) to collect information on bacteriological diagnosis of TB and document

In 2011, the TB Program South Africa used the FDIC and LDIC tools to conduct a rapid appraisal of 22 facilities in Mafikeng district and 10 facilities in Ventersdorp district of Northwest Province in response to the poor performance of the province's TB program. The assessment revealed a lack of TB registers in some facilities and poor recording and updating of results in others. These results informed the development of tailored interventions to help the facilities address their diagnostic challenges.

whether appropriate procedures were in place. Using these tools, the program can investigate laboratory challenges, share the findings with facility and district staff, develop interventions, and monitor progress through follow-up site visits.

Roll Out of GeneXpert Rapid TB Testing

Early diagnosis is essential to achieving significant reductions in death and disability as a result of TB and HIV. One of the key objectives of the USAID TB Program South Africa is to foster early diagnosis through expanded access to new and effective diagnostic technologies.

In December 2010, the WHO endorsed Xpert MTB/RIF (GeneXpert), a rapid testing machine that can simultaneously diagnose TB and detect resistance to rifampicin, one of the most important anti-TB drugs, in less than 24 hours, and has the potential to greatly reduce the delay between sputum sample collection and treatment initiation for patients with suspected MDR-TB This test can also diagnose up to 72% of smear negative pulmonary TB. In an effort to improve the diagnostic capacity for drug susceptible and drug resistant TB, South Africa was among the first countries to adopt and implement GeneXpert as a replacement of smear microscopy for all people presenting with TB symptoms. The USAID TB Program South Africa partnered closely with the NDOH to facilitate GeneXpert roll out beginning in March 2011. Great acknowledgement to the political support and government investment, South Africa now has 289 GeneXpert machines placed throughout the country (the project itself initiated the purchase and placement of 11 GeneXpert machines in project-supported districts). Since 2011, 3.2 million TB tests have been conducted and nearly 400,000 cases of TB have been diagnosed thanks to GeneXpert. The number of MDR-TB (RIF-resistant) cases identified has risen from 2,467 in 2011 to 13,817 in 2013.

Figure 4. GXP Identified Cases from 2011-2014

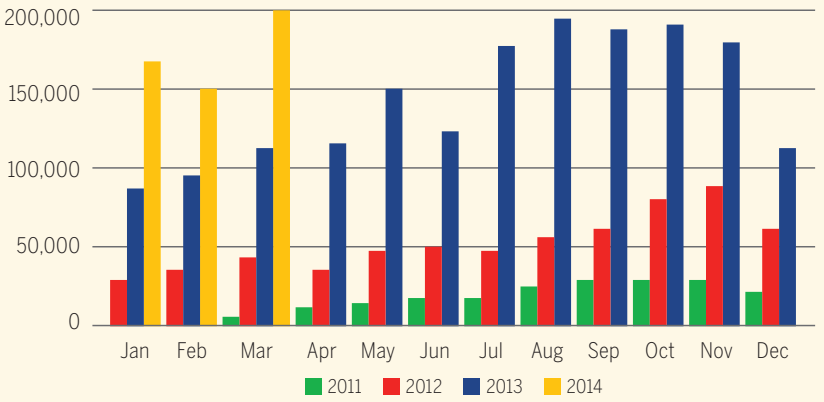
GeneXpert volumes, MTB detected: ~3.2 million tests to date (cumulative average 13% positivity) with geographical variation

Year	MTB Detected	MTB Not Detected	Test Unsuccessful	Total	% MTB Detected
2011	34,572	166,115	5,444	206,131	16.77%
2012	93,931	547,583	17,117	658,631	14.26%
2013	208,198	1,518,159	53,358	1,779,715	11.70%
2014	59,741	456,767	13,540	530,048	11.27%
Total	396,442	2,688,624	89,459	3,174,525	12.49%
% Total	12.49%	84.69%	2.82%	100%	

GeneXpert volumes, RIF resistant (7%): stable average with geographic variation

Year	Inconclusive	Resistant	Sensitive	No RIF Result	Total	% RIF Resistant
2011	332	2,467	31,618	155	34,572	7.14%
2012	1,333	6,794	85,145	659	93,931	7.23%
2013	5,286	13,817	187,990	1,105	208,198	6.64%
2014	1,536	4,075	54,017	113	59,741	6.82%
Total	8,487	27,153	358,770	2,032	396,442	6.85%
% Total	2.14%	6.85%	90.50%	0.51%	100%	

GXP Test Volumes 2011-2014



Source: Corporate Data Warehouse, National Health Laboratory Service (NHLS), Sandringham, South Africa

Capacity Building of Laboratory and Clinical Staff
USAID TB Program South Africa worked with the DOH to develop and incorporate a diagnostic algorithm for GeneXpert into the National TB Treatment Guidelines. Previously, patients with suspected DR-TB had to wait for confirmation of drug-susceptibility testing before starting on second-line treatment, and new and treatment TB cases were diagnosed using separate diagnostic algorithms. Now, health care workers are able to diagnose all TB suspects using one revised algorithm. The USAID TB Program was the lead facilitator in training health care workers during the roll out of the GeneXpert diagnostic algorithm. Through a lab-based training program, the USAID TB Program South Africa has trained 916 technical and 3,968 clinical staff on the use of the GeneXpert machines. The project continued monitoring GeneXpert roll out, working with districts and laboratories to improve compliance with the diagnostic algorithm and ensure accurate reporting. Adherence to the algorithm is continuing to improve over time. In 2012, the project conducted an OR study to assess the impact of GeneXpert on case finding and treatment outcomes in Waterberg District of Limpopo province.

Recognizing gaps in lab systems strengthening efforts at the beginning phase of the project, the USAID TB Program South Africa sought further engagement from the National Health Laboratory Services and other key stakeholders through a national forum. From November 18-19, 2013, the project facilitated a National TB Diagnostics Summit, which brought together key stakeholders to review and discuss the state of TB diagnostics in South Africa and to create a roadmap for improving laboratory diagnosis of TB throughout the country. A follow up workshop was convened focusing on childhood diagnostics in September 2014 in collaboration with the DOH, NHLS, and the University of Pretoria.

MDR-TB Management

DR-TB is a global public health crisis that threatens to undermine TB control efforts in many countries. South Africa currently has the fifth highest burden of MDR-TB in the world, with about 26,000 diagnosed cases of RR/MDR-TB (including 9,956 MDR-TB) in 2013. Approximately 10% of these MDR-TB cases were reported to have extensively drug resistant TB (XDR-TB).[1] As part of its National Strategic Plan on HIV, STIs, and TB (2012-2016), the Government of South Africa is committed to the prevention of DR-TB through improvement in identifying and curing drug-susceptible TB, and early detection and effective treatment of all MDR/XDR-TB cases. Since 2009, the USAID TB Program South Africa has supported the NDOH in combating DR-TB in the country through expanding access to diagnostics, improving programmatic management of MDR-TB at the community level, and increasing provider capacity at all levels to implement DR-TB programs.

Decentralization of MDR-TB Services
The traditional model of care for MDR-TB involves hospitalizing MDR-TB patients during the intensive phase of their treatment (6-8 months) to ensure proper administration and adherence to treatment and to limit transmission. However, this model often results in bed shortages; delays in treatment initiation for MDR-TB patients; a high likelihood of transmission of MDR/XDR-TB at health facilities; and lack of social support for patients, who are isolated from their families during treatment and who may face financial burdens due to the lengthy hospital stays.

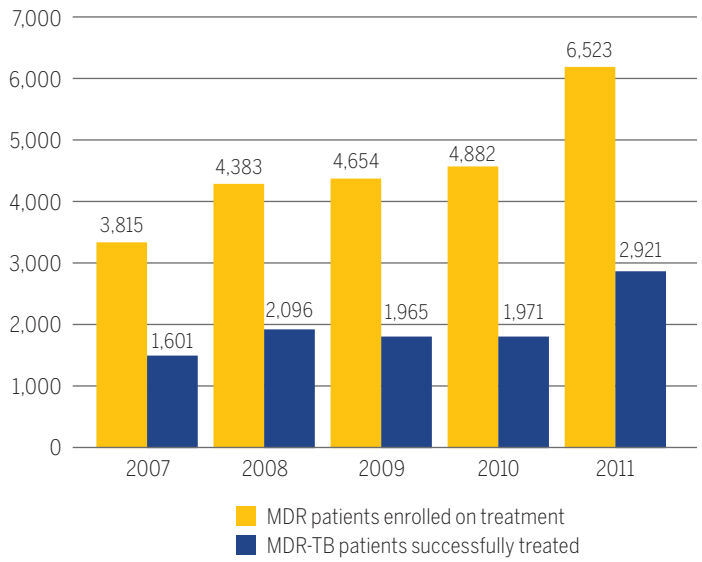
To address these challenges, South Africa is increasingly moving toward decentralized and community-based programmatic management of DR-TB (cPMDT), which is designed to allow patients to receive DR-TB treatment in decentralized facilities closer to their homes, or in their own communities. Recent studies have confirmed that community-based care for MDR-TB patients is more effective than care in a central, specialized hospital, as it improves patient adherence to medication and provides them with much-needed social support.[2] In August 2011, the DOH announced that decentralized services were the preferred method of treatment for DR-TB patients. The National Strategic Framework (2012-2016) supports decentralized management of MDR-TB, enabling provinces to initiate MDR-TB treatment as soon as diagnosis is made.

1 World Health Organization (WHO). Global Tuberculosis Report, 2014. http://www.who.int/tb/publications/global_report/en/
2 Loveday, et al. "Community-based care vs. centralized hospitalization for MDR-TB patients, Kwa-Zulu Natal, South Africa." Int J Tuberc Lung Dis 19(2):163-171, 2015

The USAID TB Program South Africa provided technical assistance to the DOH to evaluate the existing situation in the provinces and started supporting the districts towards full implementation of MDR-TB decentralized care in the districts, in line with national guidelines and initiated the development of a pilot mHealth program to improve case holding among patients with DR-TB. The program consequently developed SOPs to assist provincial adoption of the DR-TB Patient-Centred Model of Care being used to increase case detection and improve DR-TB treatment outcomes, thereby reducing further DR-TB transmission. The establishment of provincial DR-TB decentralized and pharmacovigilance committees in supported districts were facilitated by the USAID TB program. The model was based on the understanding that good clinical practice, consistent documentation of data, and two-way communication between operational and clinical managers, leads to improving the quality of DR-TB programs.

The decentralized DR-TB program has resulted in an increased number of patients on treatment. However, the treatment outcomes need to be further improved using direct community-based DOT support as well as use of innovative tools including mHealth applications that URC is designing at the moment.

Figure 5. MDR-TB South Africa World TB Report (2014)



IR 2: Increase Availability of TB Services

TB/HIV Integration

One of the main factors behind the high rates of TB in South Africa is the HIV epidemic. TB is the leading cause of death among PLHIV and is easily spread among people whose immune systems are suppressed by the AIDS virus. HIV-positive TB patients also have worse treatment outcomes than HIV-negative TB patients. In South Africa, approximately two-thirds (60-65%) of estimated new TB patients are HIV-positive.[3]

Since 2009, the USAID TB Program supported the NDOH to provide comprehensive, decentralized, and high quality TB/HIV services at the community and facility levels. The project worked with partners in 24 target district and sub-district reporting units throughout South Africa (covering 46% of districts in the country) to integrate TB and HIV services by introducing strategies to increase HIV testing for TB patients and TB screening for people living with HIV, building referral networks to TB treatment from HIV entry points and vice versa, and streamlining systems to allow co-infected patients to access care.

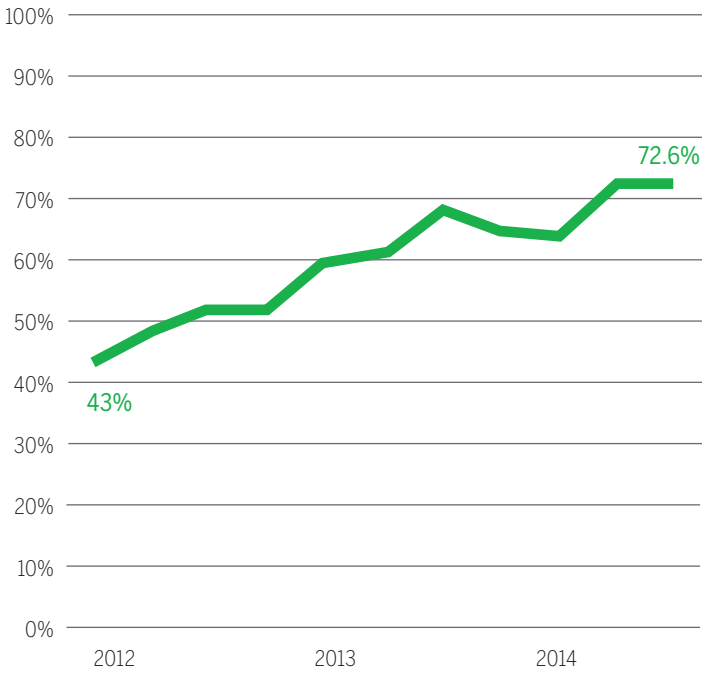
In 2012, South Africa adopted the WHO recommendation that all HIV-positive TB patients be initiated on ART, regardless of their CD4 counts. Since then, the USAID TB Program South Africa supported project target districts to accelerate ART uptake among TB/HIV co-infected patients.

The USAID TB Program South Africa was successful in steadily scaling up ART uptake across its 24 supported districts and sub-districts. As shown in Figure 6, ART uptake among co-infected TB/HIV patients in project-supported districts rose from 43.0% in January-March 2012 to a high of 72.6% in July-September 2014.

Expansion of integrated TB/HIV services has allowed more TB/HIV co-infected patients to gain access to more comprehensive and coordinated care in the project-supported districts and provinces in the country.

3 WHO, Global Tuberculosis Report, 2014.

Figure 6. ART Uptake Among TB/HIV Co-infected Patients (2012-2014)



Expanding Services to Vulnerable Groups

Throughout the life of the project, USAID TB Program sought to remain flexible and responsive in its approach to adapt its programming and expand coverage of TB and TB/HIV services to vulnerable groups. Below are some examples of groups targeted by the project through various initiatives.

Children: The USAID TB Program South Africa has worked with the NTP to raise awareness of the issue of childhood TB and developed focused interventions to address the prevention, diagnosis, and treatment of TB in children.

Miners: The USAID TB Program South Africa worked to expand advocacy and diagnosis and treatment services to mine workers by partnering with small-and medium-size mines to introduce TB into workplace wellness programs.

Workplace settings: Additionally, the project worked with the South Africa Business Coalition (SABCOHA) to raise awareness of TB in the workplace and encourage employers to adopt TB wellness programs.

Prisoners: Recognizing that adequate systems were not in place to address TB in prisons, the USAID TB Program South Africa partnered with small grantee, Footballers 4 Life and the Department of Correctional Services to incorporate TB prevention and treatment messaging into their life skills curriculum.

Integration of Palliative Care in the National Program

South Africa has made significant strides to improve identification and service delivery for the large number of MDR-TB, as well as XDR-TB cases, in the country and a large number of MDR-TB patients have been put on treatment in the last several years. The MDR-TB treatment success rate, however, is less than 50 percent. The general consensus is that with the increasing number of MDR/XDR-TB cases put on treatment, the number of cases that will remain uncured and will require palliative care will also grow and requires a planned and deliberative response to avoid opportunities for further infection. Working in consultation with the NDOH, the USAID TB Program hosted a national summit to develop a framework and operational guidelines for providing palliative care to people who fail to respond to available DR-TB treatment regimens, both to prevent the further spread of infection as well as to support patients and families through the end of life.

IR 3: Increase Demand for TB Services

Advocacy, Communication, and Social Mobilization (ACSM)

The USAID TB Program South Africa managed a robust portfolio of ACSM activities to raise awareness on TB-related issues and increase demand for TB services. The project engaged local South African partners to design, adapt, and develop appropriate messages and communication strategies for maximum impact. The USAID TB Program South Africa was supported by partners Johns Hopkins Health and Education in South Africa (JHHESA), creative agencies Matchboxology and Mediology, and community-based organizations throughout the country. Select materials were translated into English, Afrikaans, Sotho, Tswana, Vhenda, Sepedi, Xhosa, and Zulu.

Mass Media

The project supported TV PSAs; TB messaging through popular TV shows and radio dramas; radio PSAs; radio talk shows and interviews dissemination of periodical press releases to newspapers, journals, magazines, and other publications; and IEC materials such as pamphlets, fact sheets, and posters, to be widely distributed to health facilities, NGOs, faith based organizations, sports clubs, health facilities, schools, taxi ranks, bus stops and libraries. The project used mass media to help people recognize the symptoms of TB and HIV, encourage them to test early, reduce transmission of TB through proper infection control, and raise awareness of TB in children. Lap desks and other items were distributed to learners in schools with messages on TB to raise awareness. Billboards targeting the general public with important TB messages were displayed in high-volume population areas throughout the country. Giant screens (12x2 meters) were installed in 13 of the biggest taxi ranks in the country, reaching 1.7 million viewers daily. TB PSAs aired on TV and radio to reach wide general audiences with TB messages. Over the life of the project, 72% of black South African adults ages 16-64 and 62% of children ages 5-14 have been reached by TV PSAs, while 64% of adults and 49% of children have been reached by radio spots.

Lap desks being distributed to children in 2011.

Over the life of the project, 72% of black South African adults ages 16-64 and 62% of children ages 5-14 have been reached by TV PSAs, while 64% of adults and 49% of children have been reached by radio spots.

Advocacy

The project encouraged visible public leaders (e.g., religious leaders, politicians, celebrities, and decision makers) to support TB awareness, prevention, and control. In addition, provincial and district dialogues with community leaders and stakeholders were organized in partnership with the NDOH in identified districts to engage them around the key drivers of the epidemic, the challenges being faced with TB service uptake, and to develop community awareness. The project also worked with journalists to capacitate them in TB and ensure accurate and consistent coverage of the epidemic through media workshops, fact sheets, mapping of media in priority districts, and technical assistance for ACSM managers on how to engage with local media. Over the course of the project, the

Community activation in North West Province in 2012.

USAID TB Program's approach to advocacy evolved, moving from more general, basic TB information to more targeted messaging to address TB among vulnerable groups—particularly among children.

Community Mobilization

In partnership with the NDOH, the USAID TB Program South Africa developed a national TB awareness campaign called "We Beat TB". The campaign targeted adult South Africans ages 16-64 and school aged children. Promotion materials featuring the "We Beat TB" campaign brand were distributed at community mobilization activities, health education sessions, and national events such as World TB Day and World AIDS Day. The project worked with provincial and district level health departments as well as local partners to encourage communities to participate actively in TB control and to empower TB patients to take responsibility for their own health. Activities included building partnerships with local NGOs/CBOs, public stakeholders, and local businesses; door to door campaigns with health facilities and NGOs to share information with families; school activations (interactive sessions where health promoters engage school children using entertainment education materials on TB and distribute lap desks at selected schools), community dialogues and activations, community media and special events. All these activities were undertaken to raise public awareness in order to improve case detection and treatment adherence, combat stigma and discrimination, empowering people affected by TB, and to mobilize political commitment and resources for TB.

Small Grants

As a component of the project, the USAID TB Program South Africa supported community-based organizations to increase the demand for and availability of TB, TB/HIV and MDR-TB services in partnership with the NDOH, NTP, local agencies and district health managers. Their work also included the integration of appropriate ACSM activities that extended to community dialogues and the use of mass media to help people recognize the symptoms of TB and HIV, test early, adhere to treatment and take infection prevention and control measures. From 2009-2014, USAID TB Program South Africa awarded 91 grants to 75 community-based organizations throughout South Africa's nine provinces. Grants were given to local community-and faith-based organizations with the purpose of building their capacity in TB prevention and support. Larger NGOs with a proven track record in the area of TB and HIV management were also supported with funds. Through

"The URC grant added value to the fight against TB and has enabled my organization to grow in an area we were not involved before. The support from the technical team and the provincial team was very helpful in building our capacity to achieve set targets and conduct activities effectively."

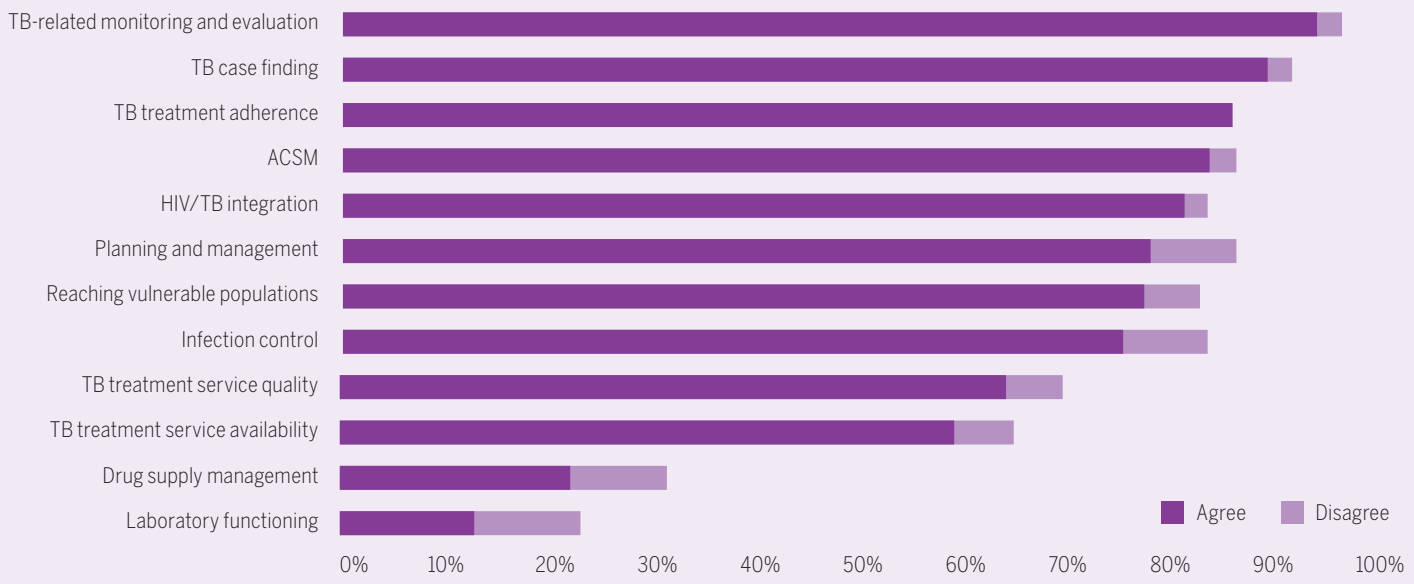
– *Small grantee respondent, USAID Evaluation Report 2014*

the grants program, these organizations were able to provide TB education, screening and treatment support to formerly unreached or underserved populations. Many grantees pioneered innovative models of service delivery and community outreach, some supported the NDOH injection teams for MDR-TB patients and door-to-door TB screening campaigns and encouraged HIV testing. NGOs empowered communities to reduce TB and HIV stigma as well as provided treatment support, which served as models for other organizations working to combat TB and TB/HIV throughout the country, particularly among vulnerable and hard-to-reach populations. Grantees worked to address TB among prisoners, mining communities, and children. They worked to expand community-based programmatic management of MDR-TB (cPMDT) and address high loss-to-follow up rates through contact tracing and increased the participation of traditional practitioners in TB control activities. As a result of the USAID TB Program South Africa Small Grants Program, more than 702,145 people were reached through intensified case finding activities and 267,260 people were screened for TB.

While the primary goal of the small grants program was to provide TB services to people, the program also acted as a capacity-building mechanism for local NGOs, helping them build their technical, financial and management systems. It also helped them establish and cultivate collaborative partnerships with the DOH to sustain and expand the provision of services after the grant ended. The USAID TB Program South Africa hosted an orientation workshop for incoming grantees and conducted routine site visits to monitor progress, provide technical assistance and address challenges. Over the course of the grant cycle, the project trained grantees on topics such as administrative and financial management, monitoring and evaluation, and TB diagnosis and treatment and TB/HIV integration. Over 1,600 care givers were capacitated through the USAID TB Program on planning and implementation of DOTS at community level and basic knowledge on TB and HIV. The project also developed a series of on-line training courses, where grantees can go to refresh their basic understanding of TB and get help managing their TB/HIV projects.

Figure 7 shows the number of grantee respondents who felt their organizational capacity significantly improved through the small grants program. The USAID-supported project evaluation clearly shows that most project funded NGOs greatly benefited from the project supported interventions in the areas of TB case finding,

Figure 7. TB Program South Africa Grantee's Organizational Capacity Improvement



M&E, TB treatment adherence, TB-HIV integration, infection control, planning and management functions among others. The majority of grantees also reported to have benefited from improvements in laboratory and supply chain functions.

The small grants program evolved significantly over the life of the USAID TB Program. From Wave 1 to Wave 5, the project refined and streamlined its solicitation process and strengthened its capacity building model to provide more targeted support to grantees at the community level. Lessons learned from the USAID TB small grants program can be used to guide future implementation of similar initiatives, and to scale up the impact of community-based organizations.

IR 4: Improve Management of TB services

Data Verification Exercises

Generating and using good quality data is essential for making sound decisions and improving management of TB services. Adequate quality assurance (QA) systems should be in place to ascertain that quality of data is ensured throughout the process including collection, recording and reporting. Poor quality data is a major problem throughout the program due to several factors: irregular data review and quality checks; lack of supervision, high staff turnover, monitoring and performance feedback, technical challenges with ETR.net; lack of skilled staff are the principal reasons for incomplete and incorrect recording and reporting of TB data.

The USAID TB Program was requested by the NTP to assist in ensuring quality data is being reported by the TB program-supported districts and sub-districts. A SOP was developed to guide and standardize the processes In coordination with the provincial and district level DOH staff, the project developed and carried out a plan for Data Verification Exercises (DVE) for a selected number of reporting facilities with the aim of identifying gaps in the TB and TB/HIV data management system and addressing them with relevant interventions. The exercise also sought to identify good TB and TB/HIV management practices with the hope to replicate them in the sub-districts and districts that are besieged with the same challenges. The exercise was carried out jointly with DOH staff, health care workers (HCWs), and project TB coordinators. At the national level, the initiative was closely collaborated with NTP and CDC which is the main technical adviser for the National TB information system. The planning and field activities for data verification were also coordinated with USG PEPFAR funded partners in districts that overlapped with the project supported districts.

The project supported over 20 DVEs covering the 6 provinces (or districts) during the project period. The data verification process included review and comparison of reported data with recorded data sources to identify discrepancies and inconsistencies in the TB and TBHIV data. Selected facility Electronic TB Register (ETR) data was reviewed and compared with clinic register data for validity and accuracy. ETR reports were discussed and all facility TB records (Case Identification Register, TB Register, patient clinic files, and ETR) were reviewed. Information was aligned in all these documents after a thorough verification and validation.

Common key findings from the data validation exercise:

- Over-reporting and under-reporting on indicators, e.g., bacteriological coverage, smear conversion rate for new smear positive cases, cure rate, treatment success rate.
- Data discrepancies between the paper-based register and ETR records, e.g., inconsistencies in dates when sputum was collected, conversion date, missing patient information.
- Non-recording of treatment start dates in the register.
- Case detection indicators are not used by the facilities; suspect rate is not routinely calculated.
- Incomplete and inconsistent recording in the patient clinic files and TB Register.
- Culture and drug susceptibility testing (DST) collection dates not recorded in the register. Staff wait for the results before recording making it difficult to tell which patients await Culture and DST outcomes, therefore no follow up is done if the lab does not deliver on time.
- Contacts are only listed, there is no indication of the investigations or follow up done.
- Clinic files of patients treated and discharged did not reflect outcomes.

The project provided technical support to the facilities to improve the quality of recording and reporting of TB data based on the findings. After every validation exercise, relevant facility staff members were briefed on the validation results and discussed ways for improvements. Apart from providing written feedback, the project also supported the facility to develop and implement a plan based on the validation findings for improving quality of recording and reporting.

The project organized training of HCWs on basic M&E and data quality assurance including recording and reporting systems and supported follow up visits to selected sites for on-site mentoring of the facility staff on standard recording and reporting practices. In 2010, the project staff visited 284 facilities in 8 districts and provided on-site training and mentoring support to facility staff to improve recording and reporting as well as conducting quarterly cohort analysis. For example, in UMkhanyakude, district in KwaZulu-Natal province, training and mentoring of data capturers resulted in clearance of the backlog. A significant contribution of the project was the introduction of the electronic Access Database with built-in filters to minimize errors which are difficult to detect when using the current Excel Database.

The project assisted the DOH with developing standard guidelines and tools for conducting DVE and training of relevant staff on data recording and reporting. Data verification was an on-going process to identify quality issues and plan remedial actions and should be an integral part of implementation of TB activities. In 2014, the TB Program focus was given to develop ownership of the DVE process and practice by the DOH and institutionalize the system for sustainable impact in the future.

Supportive Supervision/Mentorship Visits

Supervision of the TB program was not standardized nor regular which compromised assimilation and providing proper guidance in applying knowledge gained through training and other capacity building initiatives. The project strategy to address the challenge focused on developing capacity of DOH staff to assess and identify issues with supervision and facilitate them in improving effectiveness and regularity of supervision.

The project provided technical support to modify the District Rapid Assessment Tool (DRAT) and developed capacity of the DOH staff on use of this tool. In the first year, the project was successful in institutionalizing this tool in Eastern Cape Province and facilitated implementation of the DRAT exercise in all 53 facilities in Nelson Mandela Metro and 220 facilities in Amathole district. In the second year, DRAT review was conducted in 10 facilities at Mnquma sub-district. The findings of the DRAT review including feedback with recommended interventions for improvement were shared with the facility managers to follow up and take corrective actions. The DOH staff developed facility-based supervision improvement plans using the information gathered through the DRAT.

The project staff along with the provincial and sub-district DOH staff jointly conducted supervision visits to selected facilities to monitor the progress and provide feedback to plan follow up actions for improvement. Facility supportive supervision was conducted for facilities in the project targeted areas during the project period. The process involved on-site training, coaching and mentoring of facility staff based on the findings on the site. Jointly, the teams then developed QI plans that were monitored on a quarterly basis. Based on gaps identified, improvement plans were developed and training provided where required. Project interventions included strengthening DOTS implementation by improving compliance with guidelines. This was done through training of health care workers and facility support supervision to identify challenges and mentor staff to improve patient management at facility level and improve TB program performance at district level. As a follow-on to training, the project regularly organized mentoring visits to selected poor performing facilities.

Procurement of Park Homes: In FY14, USAID TB Program procured and installed eleven (11) park home modular units to be used as an addition to existing health facilities/clinics in Eastern Cape, KwaZulu-Natal, and Mpumalanga to improve the infrastructure capacity to deliver quality TB services. Infection control implementation was a challenge in some facilities being supported by the USAID TB Program due to infrastructure challenges. The project supported building temporary structures to high case load facilities to decongest facilities and improve infection control in the facilities identified as having infrastructure problems causing

increased risk of infections. Going forward, the Park homes will also be utilized to improve integration of TB/HIV services, which is a priority for NSP on HIV STI and TB 2012-2016 strategy.

District HAST Committees

The USAID TB Program continued to support the Quarterly District HAST committee meetings in all supported districts. These committees formed with members from TB and HIV/AIDS directorates and other partners were designed to improve joint planning, coordination and management of co-morbidities, e.g., TB, HIV AIDS and STIs. The committees reviewed TB HIV program progress, challenges, and recommended operations and administrative actions as necessary to achieve programmatic goals.

The project regularly participated in the existing District HAST, sub-district and provincial TB/HIV collaborative meetings. The project's role in these meetings included facilitation, sharing project updates and implementation issues such as developing a standard operating procedure (SOP) for guiding districts on how to conduct district HAST quarterly reviews. The project also participated in the HAST strategic planning session in Gauteng and Western Cape provinces and provided technical input to developing their 5-year strategic plans.

The project objective for supporting and participation in HAST and other district and sub-district level meetings was to advance the project objectives for scaling up TB/HIV collaborative model and develop support to project supported interventions. The program reviews and oversight by the committees were valuable for improving care for TB/HIV patients, strengthening integration and linkages between TB, and HIVAIDS in facilities, and contact and defaulter tracing. In particular, the following changes would have been difficult to achieve without support of these committees:

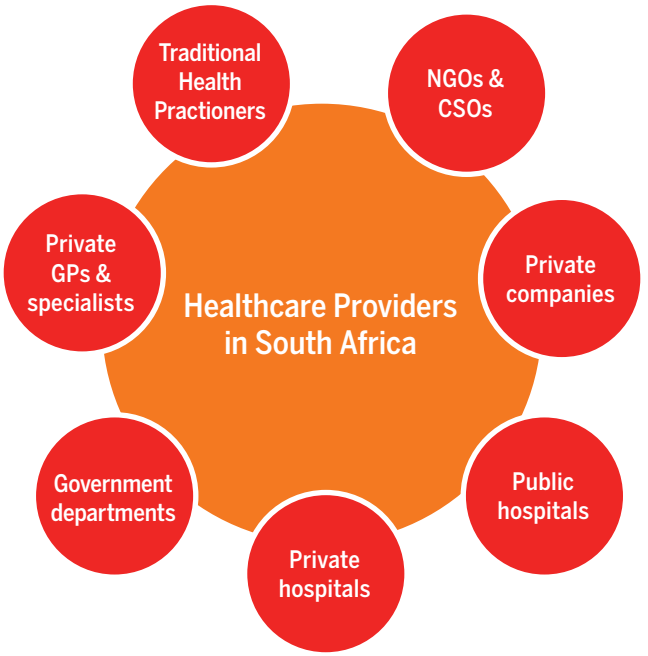
- Integrated management of TB/HIV co-morbidities in facilities
- Increasing uptake of ART
- Improved management and outcomes of TB services
- Strengthening supervision for monitoring and data quality assurance
- Better coordination of training of TB/HIV comorbidities

IR 5: Tested New Approaches for Expanding DOTS Coverage

Public Private Mix (PPM) Approach

One in five South Africans seek care from the formal private sector health services, and an estimated 80% of South Africans consult with traditional health practitioners (THPs) alongside general medical practitioners. TB registration, testing, and treatment initiation occurs in the public sector—making strong collaborative working relationships and effective referral mechanisms between the public and private sectors critical to the overall success of the TB program. The USAID TB Program adopted a PPM approach to addressing TB—engaging all health care providers and private sector partners in the delivery of TB prevention and control services.

Figure 8. PPM Approach in Addressing TB



Engaging THPs

In 2012, the USAID TB Program South Africa conducted a study to assess the high mortality rates among TB patients in Makhuduthamaga sub-district, Sekhukhunue District, Limpopo

THPs working with professional nurses on collecting sputum samples from TB suspects in Limpopo Province, 2013

Province. One of the main contributing factors identified was that patients were presenting with TB very late at public health facilities—having previously sought alternative therapies from THPs. In order to encourage earlier diagnosis and treatment initiation for TB patients, the USAID TB Program advocated for the involvement of THPs in active TB case finding, referral, and treatment support. USAID TB Program South Africa, in partnership with sub-district health officials, held a meeting with 122 THPs working in the region. They shared the results of the TB mortality study and outlined the critical role that THPs could play in combatting TB and reducing TB-related mortality in their communities. THPs pledged their commitment and requested training on TB. It was agreed that better working relationships needed to be established between the formal and informal health sectors. The THPs were linked to health facilities based on the catchment populations with whom they worked. An assessment of THP knowledge, attitudes, and practice related to TB was conducted to better inform their training needs. Two training sessions in basic TB management were held for THPs in April and August 2013. A total of 67 THPs received training, and 11 TB focal nurses also participated in the training to facilitate further partnership. USAID TB Program South Africa piloted a THP TB screening tool in Limpopo Province to assist THPs in supporting active case finding. With strong support from the USAID TB Program and the DOH, THPs were able to serve an important role as health educators, referral agents, and DOT supports in Makhuduthamaga. The sub-district continues to identify ways to capitalize on the use of THPs in promoting TB prevention and control.

South Africa's more than 500,000 mine workers currently have the highest rates of tuberculosis (TB) in the world. In 2011, 11% of South African mine workers were infected with TB. The majority of those working in South Africa mines are migrant workers from neighbouring countries (Lesotho, Mozambique, and Swaziland), resulting in a huge threat of cross-border spread.

The USAID TB Program's support for improving TB services within the mining sector focused on developing lasting multi-sectoral partnerships geared around the following activities:

- Advocacy and consensus building among mine operators, mine health services, mine laborer's representatives, and district department of health on practical steps to implement the objectives within the declaration on TB in the Mining Sector, a legal instrument, signed by 15 heads of state at the Summit Meeting of the SADC in August 2012.
- Development of service linkages between TB and other health and social support agencies working with current and ex-miners and mining communities.
- Assistance to develop and expand TB workplace programs in small and medium sized mines. The TB Program's approach has emphasized developing programs and TB service linkages within several small and medium size mines in Limpopo and Gauteng provinces and has facilitated coordination with local community based TB awareness and treatment services able to work with mining communities.

Mine workers at Medupi Power Station are screened for TB.

Program Impact

The USAID-supported project evaluation in 2014 reported that after examining the performance of project-supported districts vs. districts that received no support (using NTP data), there is evidence that the project contributed to better TB outcomes, including improved treatment success rates, default rates, and TB screening among HIV patients.

Outcome Indicators

Smear Conversion Rate

The smear conversion rates increased slightly: between 2009 and 2014 the rate increased from 70.5% to 78.4% for the new smear positive cases and from 63.3% to 72% for the retreatment cases.

Figure 9. Sputum smear conversion rates, TB Program South Africa Data (2009-2014)

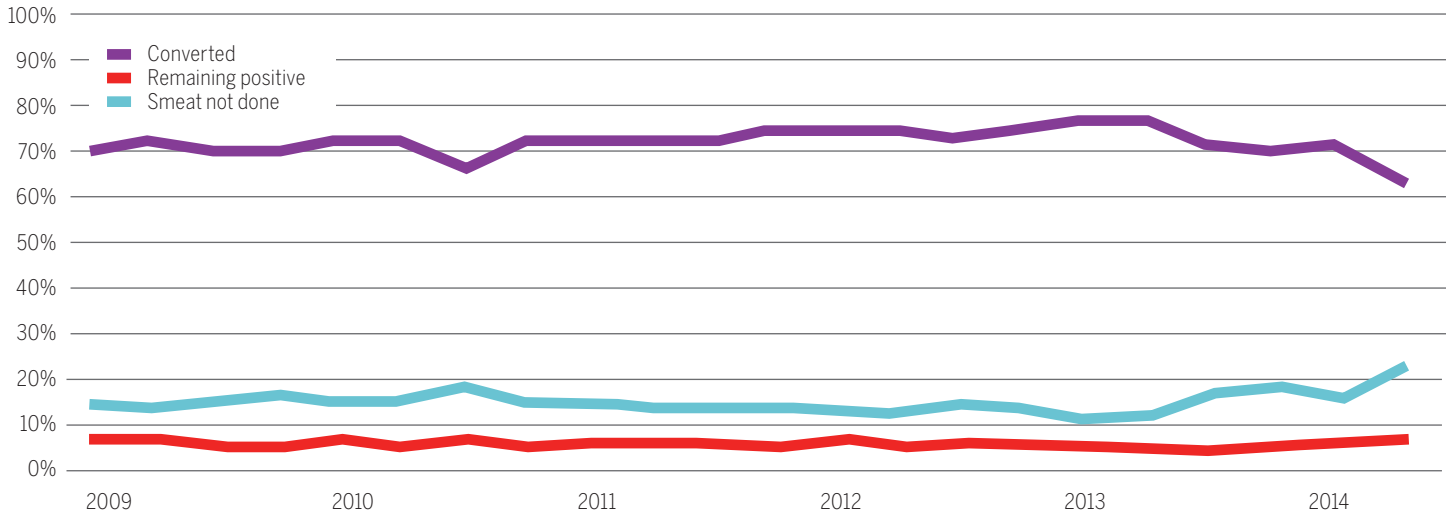
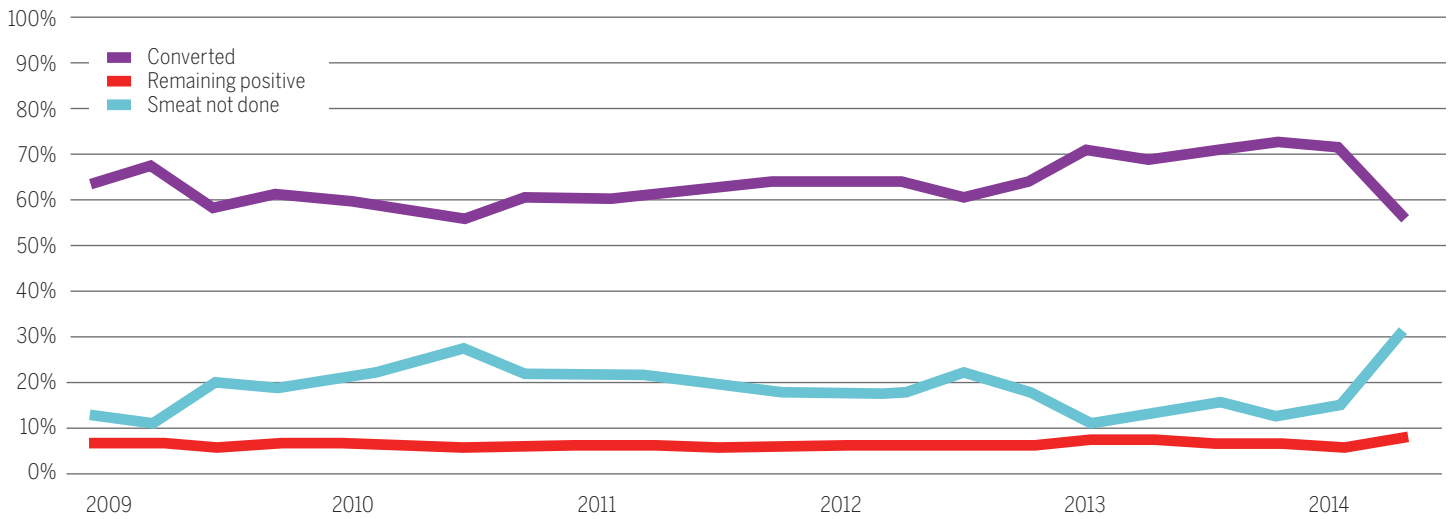


Figure 10. Smear Conversion Rates for Retreatment Cases, TB Program South Africa Data (2009-2014)



As of last quarter, Q1/2015, 11 of the 25 reporting units did manage to reach and surpass the smear conversion rates targets of 75% for new smear positive cases.

There was a slight decline in smear conversion for both new smear positive and retreatment cases in the final quarter, Q1/FY15 at 63% and 55% which is mostly attributable to the challenges with the ETR.net and inconsistent use of TB appointment diaries.

Treatment Outcomes: TB Cure Rate, Treatment Success Rate, Loss to Follow Up (Default Rate)

The project's overall target for treatment success rate (TSR) for new smear positive cases was 85% and for the retreatment cases was 65%. In FY2015, the project achieved 81.5% TSR for new cases and 66.7%% for the retreatment cases with cure rates of 74% for new cases and 54.6% for retreatment cases respectively. A review of the district performance shows that 6 of the 25 reporting units achieved the target for TSR for new smear positive cases and 9 reached the target for retreatment cases. Overall, the project districts reported TSR for both

Figure 11. Treatment Success Rate, New TB Cases, TB Program South Africa Data (2008-2013)

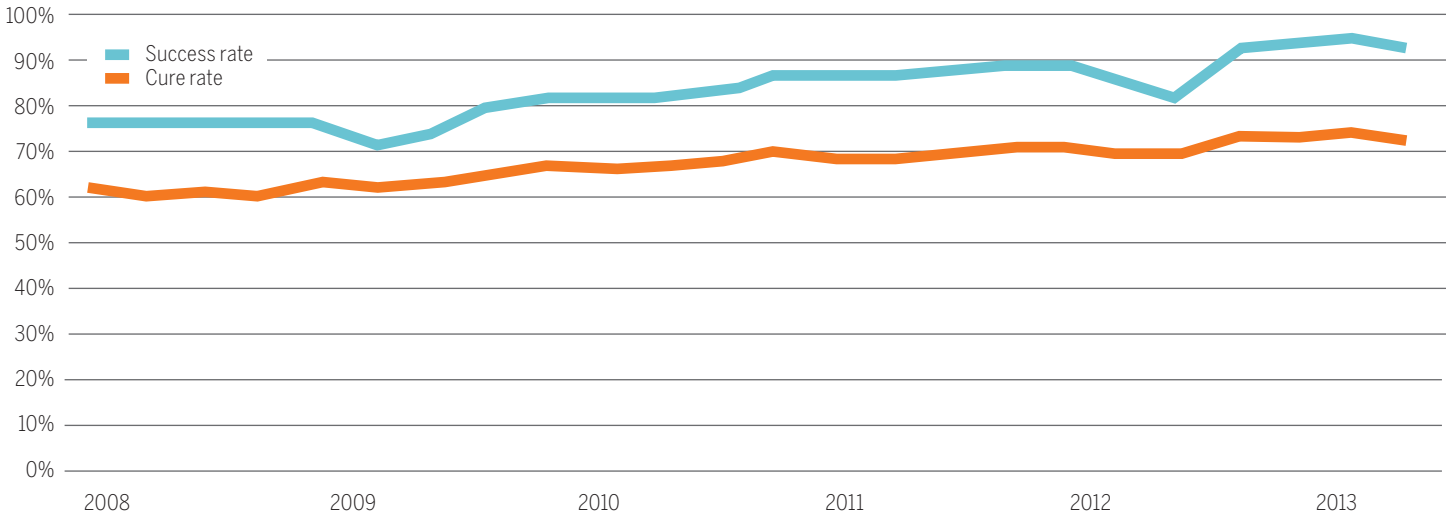


Figure 12. Unfavourable Treatment Outcomes, New TB cases, TB Program South Africa Data (2008-2013)

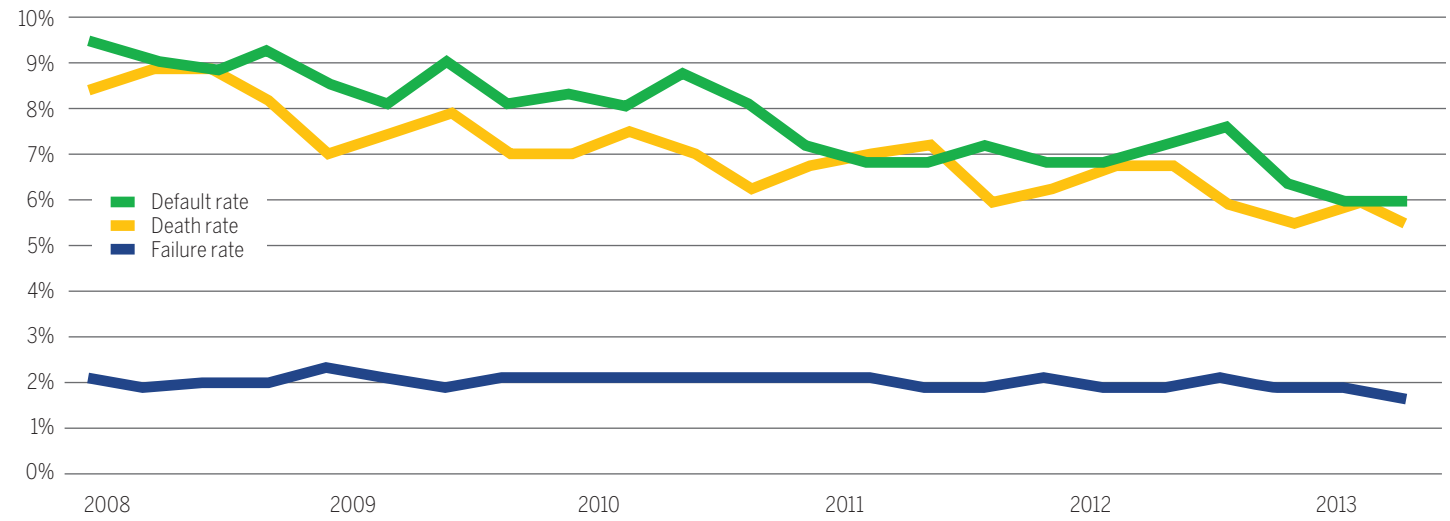
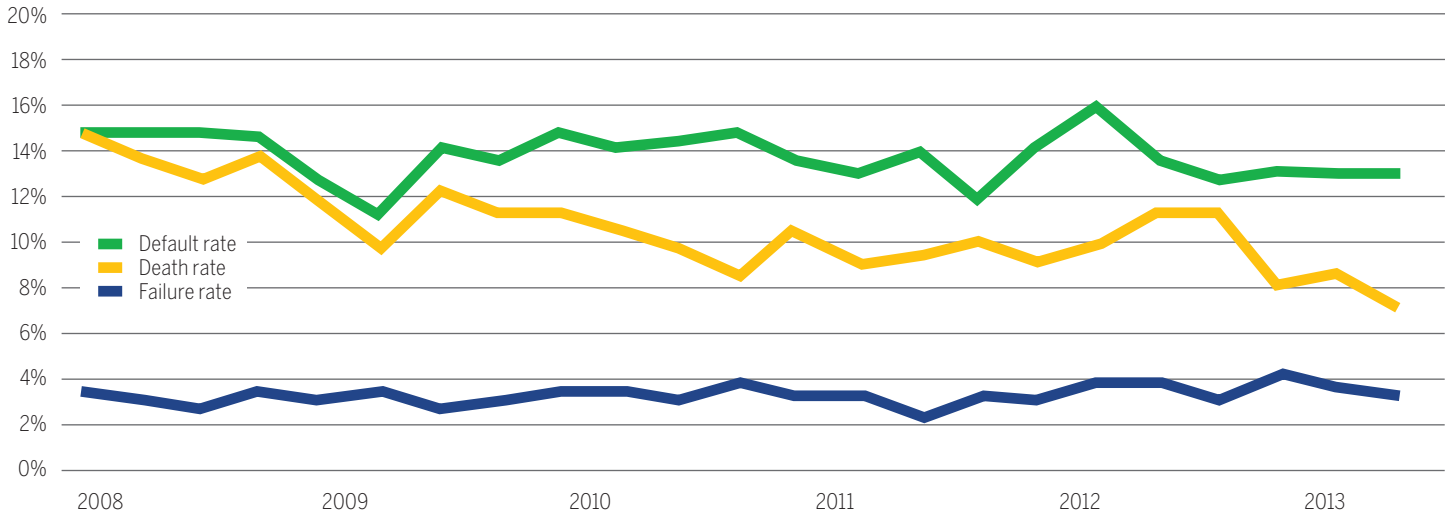


Figure 13. Unfavourable Treatment Outcomes, Retreatment Cases, TB Program South Africa Data (2008-2013)



new and retreatment cases higher than the national achievements of 77% for new cases and 64% for the retreatment cases for the 2012 cohort.[4] A 2014 evaluation of the USAID TB Program found that districts that were directly supported by the project generally started off with lower treatment success rates, as the DOH and the project purposefully targeted poor-performing districts, but that the improvement in project-supported areas was 1+ percentage point greater than seen nationally—8.1% for districts and 8.7% for sub-districts.

Death rates have declined significantly over the project duration with death rates in new cases declining from 8.4% in 2008 to 4.8% in the period of September to December 2013. Retreatment TB cases also improved mortality rates with death rate declining from 14.7% to 7.2%, almost half of value at project start. Lost to follow up rates also showed improvements in both new and retreatment cases with values declining from 9.5% and 15.3% to 6.7% and 12.7% respectively.

HIV Testing Rate Among TB Cases

HIV testing for TB clients has increased and has remained over 80% with project support, reaching 86.5% in 2014 (Figure 14).

TB Screening Rate Among HIV-positive Clients

As seen in the Figure 15 the number of HIV-positive people screened for TB has been increased.

Figure 14. HIV Testing Among TB Cases (2012-2014)

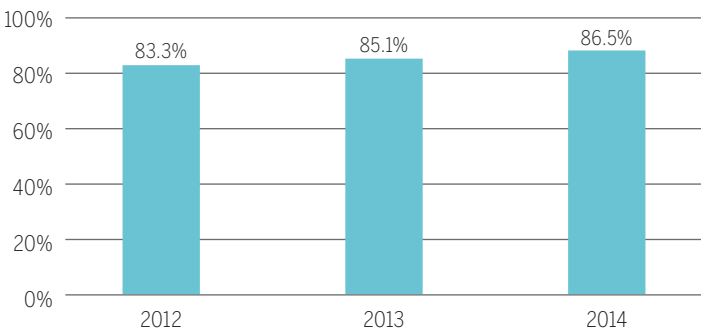
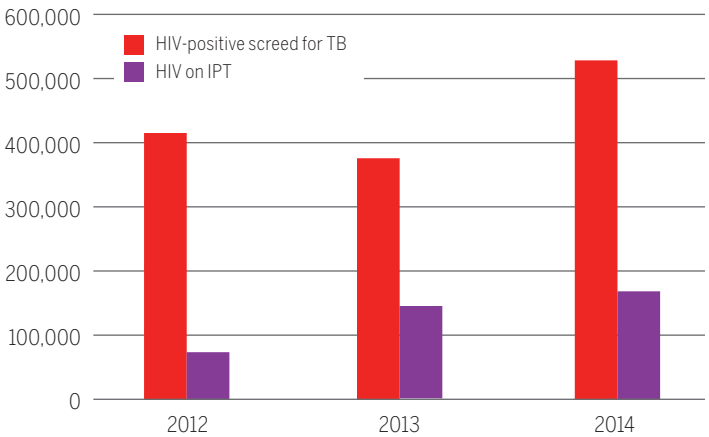


Figure 15. Number of HIV-positive People Screened for TB (2012-2014)



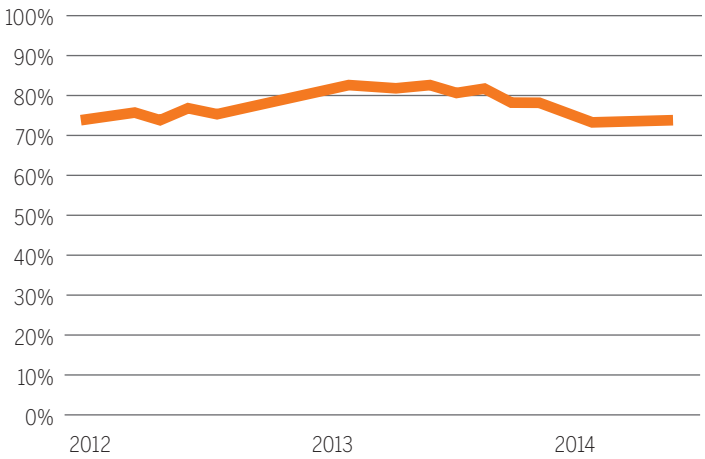
4 WHO, World TB Report, 2014

Other Notable Results

Bacteriologic Coverage

Overall bacteriological coverage was improved as most districts migrated to the ETR.v2. The national target of 90% bacteriological coverage was not achieved; however meaningful progress has been made in supported districts.

Figure 16. Bacteriological Coverage (2009-2014)



Capacity Building and Training

Over the life of the project, the USAID TB Program South Africa trained 19,167 HCWs, including 917 doctors, on basic TB management, MDR-TB, and TB/HIV. See Tables 1-3 for more details.

Overall, DOH staff were very pleased with the quality of the training provided and the capacity developed. Figure 17 shows those respondents to the USAID TB Evaluation Report who agreed that the USAID TB Program significantly improved capacity in a variety of areas related to TB.

The USAID TB Program South Africa focused heavily on increasing capacity to deliver high-quality TB services at the facility level. The

Over the life of the project, the USAID TB Program South Africa trained 19,167 HCWs, including 917 doctors, on basic TB management, MDR-TB, and TB/HIV.

Figure 17. Improved Capacity Building by Trainings provided by the TB Program South Africa

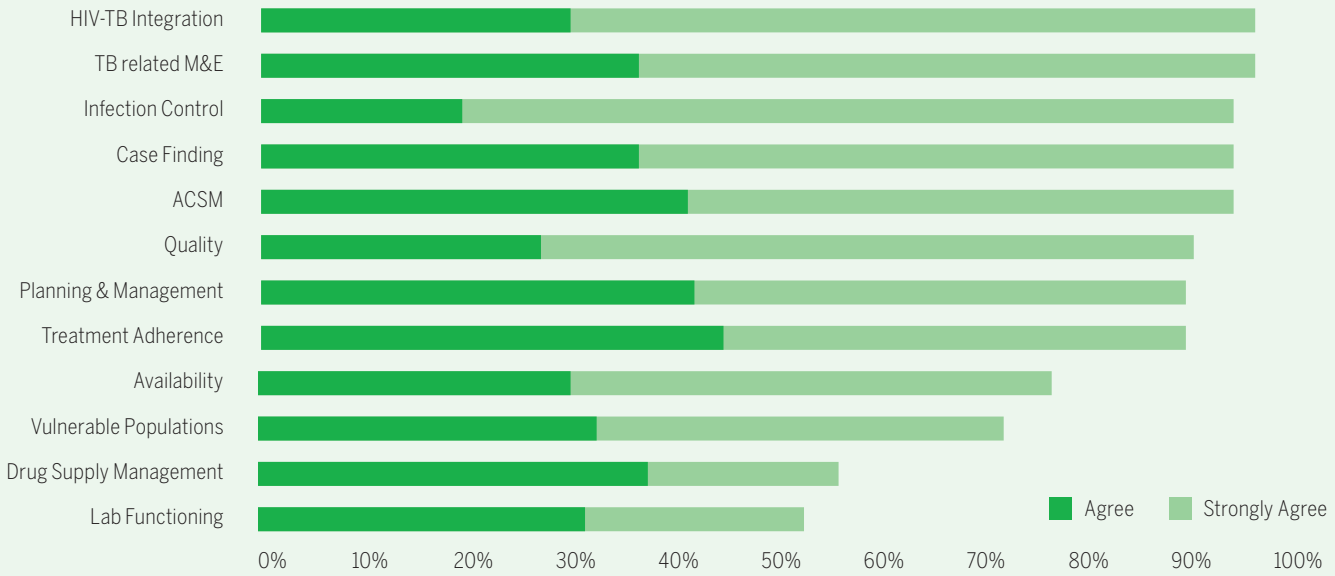


Table 1. Summary of USAID TB Program South Africa Training

Training Topics Covered

- TB Infection control training
- TB/HIV clinical management training
- ACSM training
- Basic TB Management training
- TB/HIV Collaborative Approach training
- Clinical Management of Drug Resistant TB training
- TB facility risk assessment training
- TB Management Training for Supervisors/ Managers training
- TB/HIV and MDR-TB management trainings facilitated by project's partners e.g. the International Union Against Tuberculosis and Lung Diseases (The Union), JHHESA
- Training of CHWs / NGOs
- PPM workshops
- TB Diagnostics training
- NGOs Trainings

Training Materials Developed

- TB and HIV Care and Management Course for Health Care Workers Participant Manual
- TB and HIV Care and Management Course for Health Care Workers Facilitator Manual
- Clinical Resource Guide version 1.6 October 2013
- TB Diagnostics materials
- Comprehensive Course Clinical Management of Drug Resistant Tuberculosis
- District Rapid Assessment Tool (DRAT)
- TB Infection Prevention and Control Training Curriculum for Health Care Workers in S. A: Participants manual
- TB Infection Prevention and Control Training Curriculum for Health Care Workers in S. A: Facilitators manual
- Facility TB Risk assessment tool
- Facility TB Scoring sheet

program conducted risk assessments at facilities and helped staff developed TB infection prevention and control plans to improve the quality and safety of TB services. These activities are summarized in Table 4.

Public-Private Mix (PPM)

As a result of USAID TB Program South Africa efforts to promote a public-private mix of TB services, more than 11,033 cases of TB were diagnosed by the non-DOH sector from 2009-2014 see Table 5.

Table 2. Total Number of HCWs Trained on TB, TB/HIV and MDR-TB

Period	HCWs Trained on TB and related topics
2009-2010	4,210
2010-2011	4,018
2011-2012	3,576
2012-2013	3,805
2013-2014	3,558
Overall	19,167

Table 3. Number of Doctors Trained on TB, TB/HIV and MDR-TB

Period	HCWs Trained on TB and related topics
2009-2010	159
2010-2011	157
2011-2012	265
2012-2013	202
2013-2014	134
Overall	917

Table 4. Facility Risk Assessments and Infection Prevention and Control Plans

Period	Number of facilities assessed	Number of facilities with TB IPC Plans
2009-2010	145	50
2010-2011	219	200
2011-2012	111	29
2012-2013	176	41
2013-2014	10	1
Overall	661	321

Table 5. Total TB Cases Reported, Non-DOH Sector

Period	TB Cases Reported
2010-2011	3,126
2011-2012	3,003
2012-2013	3,529
2013-2014	1,375
Overall	11,033

Program Success Stories

Accelerating ART Uptake Among TB/HIV Co-Infected Patients in South Africa

Case Study: Mahikeng Sub-District, North West Province

Background

Mahikeng sub-district of Ngaka Modiri Molema, a rural district with pockets of semi-urban areas. The population of 842,699 is highly mobile due to scare employment opportunities in the region, putting them at greater risk for TB and HIV infection. Approximately 50% of TB patients in the district are co-infected with HIV. In 2012, only 32.5% of TB/HIV co-infected patients were initiated on ART and CPT uptake was also low, at 68.5%. A data verification exercise (DVE) in Mahikeng noted poor integration of TB/HIV services, resulting in high mortality from both diseases.

USAID TB Program South Africa Program Interventions

Based on the results of the DVE, USAID TB Program South Africa formulated an intervention plan to improve TB/HIV service integration in Mahikeng which included the following:

1. Training of health care workers: Training on quality improvement techniques, including the Plan, Do, Study, Act Cycle (PDSA) was conducted for operational managers and TB focal nurses. Health care workers were also trained in TB/HIV management and recording and reporting requirements.
2. Supportive supervision: Supervisory support visits were conducted to targeted facilities. Facility staff were provided with need-based in-service education, mentoring, and coaching. Facility quality improvement plans allowed staff to monitor and evaluate their progress toward TB/HIV integration targets.
3. Quarterly TB/HIV collaborative review meetings: At quarterly review meetings, USAID TB Program and district staff reviewed ETR reports, discuss data recording, reporting, and implementation challenges, identified proposed solutions, and shared best practices.

Results

From 2012-2014, Mahikeng saw an increase in ART uptake from 32.5% to 94.2%—outperforming the national program. During the same period, CPT uptake rose from 68.5% to 97.2% while the percentage of TB patients knowing their HIV status rose from 85.9% to 94.8% (Table 6).

Table 6. Mahikeng TB/HIV Integration Indicators (2012-2014)

Indicators	2012	2013	2014
TB patients with known HIV status	85.9%	92.9%	94.8%
TB/HIV co-infected on CPT	68.5%	92.9%	97.2%
TB/HIV co-infected on ART	32.5%	75.6%	94.2%

From 2012-2014, Mahikeng saw an increase in ART uptake from 32.5% to 94.2% — outperforming the national program.

Accelerating ART Uptake Among TB/HIV Co-Infected Patients in South Africa

Case Study: Amathole District, Eastern Cape

Background

Eastern Cape Province has the second highest TB burden in South Africa, and Amathole, a rural district with a total of 244 primary health care facilities, was among districts declared a TB crisis district in 2006. The USAID TB Program South Africa supported Amathole to address its dual TB/HIV epidemic. A baseline assessment conducted in the district revealed huge gaps in TB and HIV service integration, with ART uptake among TB/HIV co-infected patients at about 43% in 2012. The assessment also revealed a lack of staff capacity in TB/HIV management, poor recording and reporting of TB and TB/HIV data, and a lack of supervision of health care workers.

USAID TB Program South Africa Program Interventions

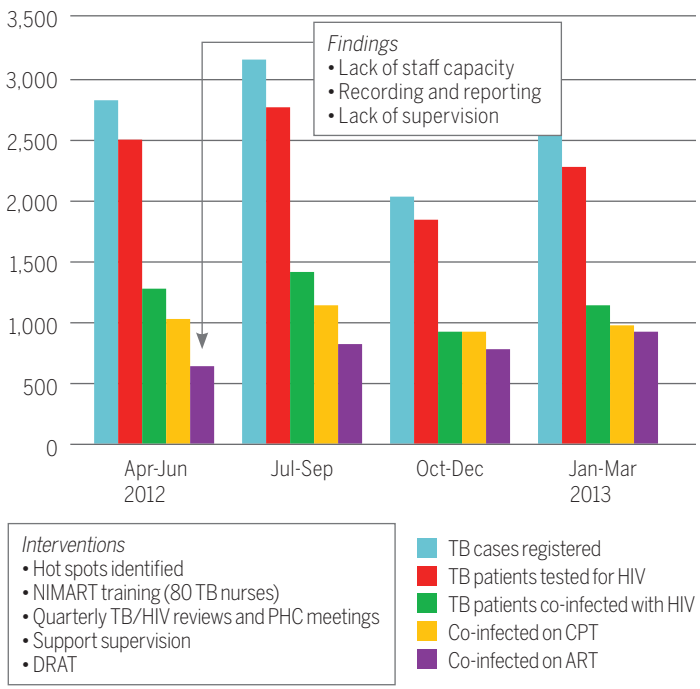
USAID TB Program South Africa coordinators worked closely with counterparts at the provincial and district level, as well as the Regional Training Center, to develop a focused intervention plan to address poor TB/HIV integration, based on a comprehensive gap analysis and review of the district ETR reports. Interventions included:

1. Identification of hotspot sub-districts and facilities: Interventions were primarily targeted at Buffalo City sub-district, the largest sub-district which had the district's highest TB caseload. Facilities with high TB caseload and poor reporting or poor TB outcomes were targeted for more intensive support.
2. Targeted training of TB nurses: Sixty (60) TB focal nurses were trained in nurse-initiated and managed ART (NIMART), giving them the ability to begin TB patients infected with HIV on ART treatment without referral to a doctor or another treatment facility, saving patients both time and money. In facilities where TB focal nurses were not trained on NIMART, HIV focal nurses were encouraged to screen all HIV-positive patients for TB, and to immediately initiate those found to be co-infected on ART.
3. Dissemination of national guidance: USAID TB Program South Africa supported provincial, district, and sub-district counterparts to disseminate the 2012 National Department of Health Directive for acceleration of ART, so that all health care workers were properly informed of the new policy on immediate initiation of ART for TB/HIV patients, regardless of CD4 count.
4. Quarterly TB/HIV reviews: Quarterly TB/HIV as well as primary health care meetings were used as a platform to review progress, identify and address challenges, and renew partner support.
5. Facility mentoring: Champion facilities were provided with ongoing mentoring on TB and TB/HIV recording and reporting, and routine record audits were conducted. The district rapid assessment tool (DRAT) was also used to monitor progress.

Results

As a result of implementation of the package of TB/HIV interventions, Amathole district saw a rapid increase in ART uptake rates, from a baseline of 43.3% in April-June 2012 to 79.0% in January-March 2013. Uptake of cotrimoxazole preventive therapy (CPT) also rose from 79.1% in April-June 2012 to a high of 91.7% in October-December 2012.

Figure 18. Amathole District TB/HIV Integration Results (2012-2013)



Accelerating ART Uptake Among TB/HIV Co-Infected Patients in South Africa

Case Study: We Beat TB Campaign

Background

South Africa faces a severe dual epidemic with 12.2% of the population being infected with HIV and TB incidence of 1003/100,000 (WHO 2013), with 65% of people infected with TB co-infected with HIV. Previous research found low levels of TB/HIV co-infection knowledge.

Intervention

'We Beat TB' was part of a national evidence-based communications strategy that employed both mass as well as local media to improve knowledge on TB prevention, encouraging early presentation for diagnosis and treatment adherence, cough etiquette for onward transmission of TB, among others. The 'We Beat TB' brand, originally conceived under the USAID TASC II TB Project (2004-2009) was continued and expanded upon by the USAID TB Program. The project created a media tunnel using national and local TV and radio stations, in addition to print and traditional media. The project also supported community mobilization around the 'We Beat TB' interventions.

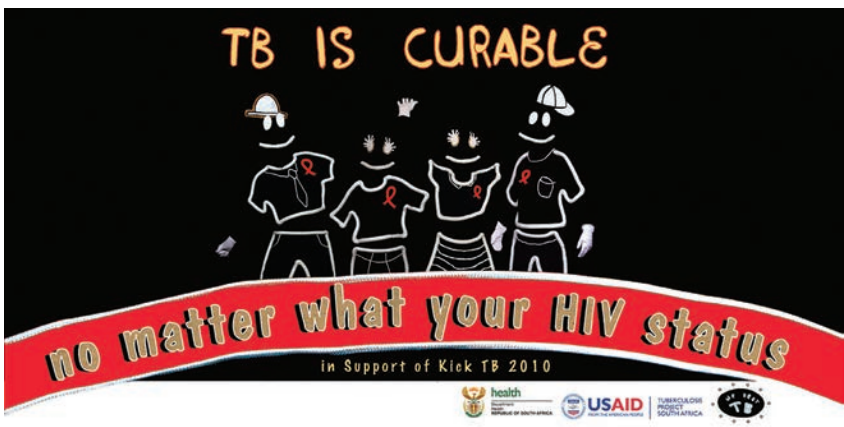
Messages around TB and TB/HIV co-infection were broadcast on national television and radio channels between year 2009 and 2014. Key message delivered included: 'Open your windows and cover your cough', 'Take 180 doses to be number one ok! (TB can cured)' and 'TB is curable-even if you have HIV'.

The campaign was evaluated using a cross-sectional study; data collected from a sample of 10,034 males and females aged 16-55 years. Multivariate regression analysis was used to determine significant factors contributing to the impact.

Those exposed to the campaign were 1.3 times more likely to have tested for HIV in the past 12 months.

Results and Lessons Learned

13.6 million or 48.3% of South Africans aged 16-55 knew about the campaign (51% of females and 46% of males). 84% of respondents knew that people living with HIV (PLHIV) were more likely to get TB (86% of females and 82% of males). 78% knew that it was possible to cure TB in PLHIV (82% of females and 74% of males). Controlling for other factors, those with high exposure to 'We Beat TB' were twice as likely to have high knowledge of TB/HIV co-infection (AOR: 2.06; 95% CI 1.79-2.37). Those exposed to the campaign were 1.3 times more likely to have tested for HIV in the past 12 months.



Case Study: Decentralizing DR-TB Services in North West Province

In January 2015, USAID TB Program South Africa attended a launch event celebrating the official opening of functional decentralized DR treatment sites in Bojanala and Ngaka Modiri Molema districts in North West Province. North West is only the second province, after Kwa-Zulu Natal, to achieve full realization of DR-TB decentralization, which was accomplished through a sustained and committed partnership with the USAID TB Program South Africa over the past three years.

Community MDR management training in Ngaka Modiri Mdema district

Decentralization Process

Identification and Training of Doctors: Since 2011, USAID TB Program South Africa has partnered with the International Union against TB and Lung Disease (IUATLD) to deliver DR-TB training to doctors and develop trainer-of-trainers (TOTs) to prepare districts for DR-TB decentralization. Thirty (30) doctors from North West Province attended a three-day DR training workshop facilitated by the Union.

Facility Readiness Assessments: USAID TB Program South Africa conducted facility readiness assessments to determine the feasibility of various health facilities in North West to support decentralized TB services. Following the initial assessments, quality improvement plans for each facility were developed to help them attain the minimum requirements to support decentralization.

District Workshops: USAID TB Program South Africa also conducted two-day workshops for district-level managers to develop standard operating procedures for activating decentralized sites. During these workshops, districts agreed on the process for down referral of DR-TB patients and a framework for monitoring and evaluating the decentralized sites. USAID TB Program South Africa is also assisting the districts in establishing district-level Clinical Review and Pharmacovigilance Committees, which will be responsible for oversight of the decentralized program, including monitoring patient treatment outcomes and adverse effects.

Site Activation

In November 2014, the first 90 stable MDR-TB patients were down-referred to the JST Hospital Rustenburg in Bojanala District. The hospital is also now currently initiating newly-diagnosed MDR-TB cases onto treatment. In Ngaka Modiri Molema District, 43 MDR-TB patients were down-referred to the decentralized site at Gerlukspan Hospital. A ceremony was held for these patients, welcoming them to the new site closer to their homes and to encourage them to adhere to treatment.

Case Study: Supporting Grantee Philanjalo to Raise Awareness of DR-TB Decentralization

Philanjalo, an NGO based in the Tugela Ferry region of Kwa-Zulu Natal, was among the first to recognize the emerging MDR-TB epidemic. In 2007, with support from various partners and the DOH, Philanjalo established one of Africa's first community-based MDR-TB management programs. This care model helps patients complete their treatment and reduce overcrowding in hospitals. It involves establishing mobile teams of nurses who conduct daily home visits to give second-line TB drugs by injection to patients and observe doses of oral TB medications and antiretrovirals (ARVs).

From March 2011-April 2013, USAID TB Program South Africa awarded a grant to Philanjalo to raise awareness and engage communities on MDR-TB decentralization in eight provinces (Eastern Cape, Free State, Gauteng, KwaZulu Natal, Limpopo, Mpumalanga, Northern Cape and North West), as well as assist some districts in developing their district-level decentralization plans. Through USAID TB Program South Africa support, Philanjalo facilitated 14 provincial and 22 district advocacy and capacity-building workshops on comprehensive community-based MDR-TB management, training 539 provincial, district, and sub-district managers. Philanjalo also worked to improve the skills of nurses, TB assistants and other health workers to carry out community-based management of MDR-TB. Philanjalo developed training materials and tools and helped to train 634 health workers.

After two years of support, districts were in different stages of decentralization, but progress was seen throughout the country. More than 2,000 MDR-TB patients were receiving follow up in the community during injection and continuation phases, with uThungulu and Zululand districts in KwaZulu Natal recording the largest number of clients followed and injection team members trained.

Reaching Vulnerable Populations through the Small Grants Program

Case Study: Footballers for Life

Prisoners and former prisoners worldwide are at a higher risk of TB than the general population. Overcrowding, poor ventilation and nutrition, limited health services, and lack of proper referral and follow-up upon release can fuel TB transmission, putting other prisoners, prison staff and families and communities of released prisoners at risk.

Footballers for Life (F4L) is committed to addressing the challenge of TB in prisons through the motivating and engaging medium of football (a.k.a. "soccer"). F4L uses retired professional football players who are trained in life skills and wellness to work with communities to share their knowledge and experience. The players, known as Wellness Coaches, help create and promote sustainable behavior changes that help prevent TB and HIV. In a country such as South Africa where "football rules," these retired players have a unique ability to influence and impact behavior change that other health promotion workers lack.

For the past four years, F4L has worked in prisons in Gauteng and Free State Provinces, promoting healthy behaviors among inmate populations. In 2013, F4L received funding through the USAID TB Program South Africa small grants program to conduct TB/HIV and life skills education sessions and TB/HIV advocacy events at correctional facilities, improve TB case detection for inmates and establish functional and effective TB/HIV support groups in correctional facilities.

With training and technical support from the USAID TB Program South Africa, including the provision of TB screening tools and IPT registers, F4L was able to:

- Reach 4,963 inmates and 2,282 Department of Correctional Services Officials (wardens) with TB and HIV awareness campaign messages.
- Train 1,561 inmate peer educators on life skills. These graduated "Assistant Coaches" are now able to engage fellow inmates on TB, HIV/AIDS, and other health issues.

F4L's wellness coaches and community participants

- Establish 10 inmate-led DOT groups, which assisted in screening 2,066 inmates, identifying 498 patients with presumptive TB, and referring 393 TB patients for HIV counseling and testing.
- Assist in the development of integrated TB and HIV/AIDS guidelines for the Department of Correctional Services.

Addressing TB in Children

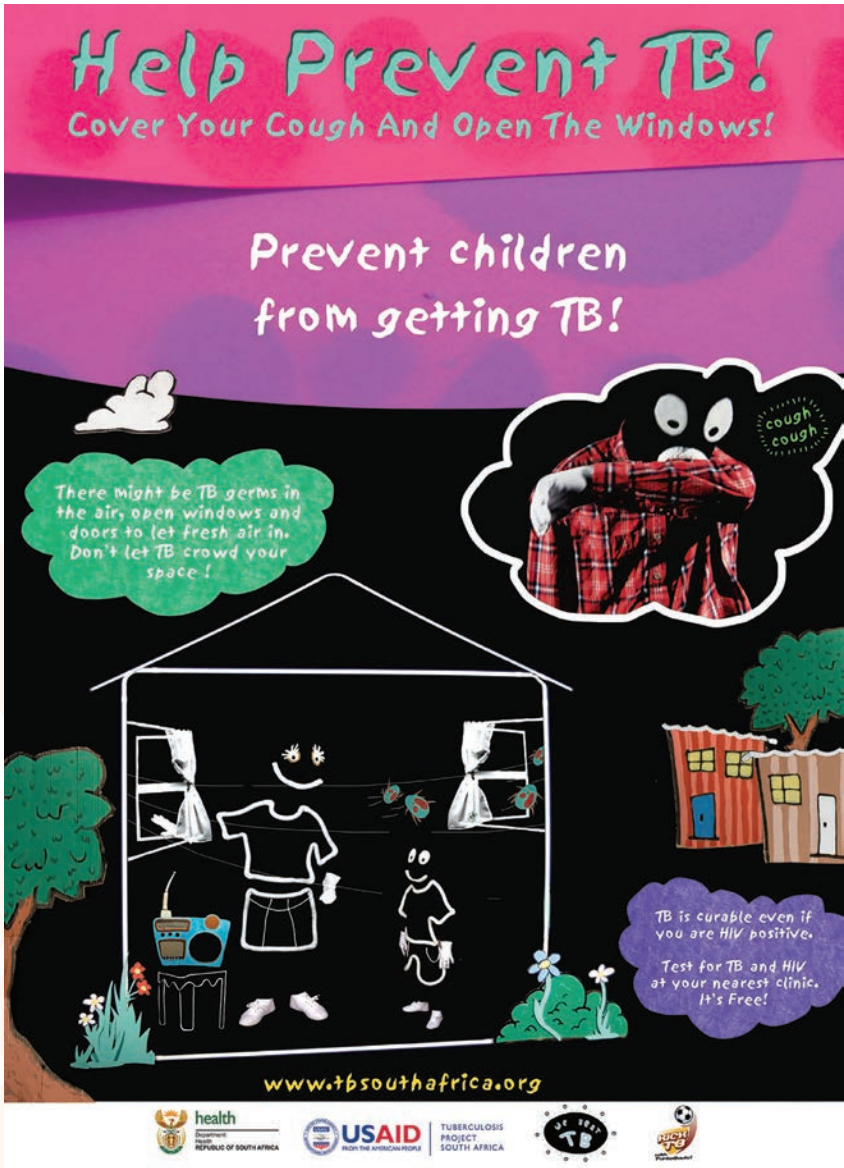
TB remains a serious threat to child health in many parts of the world. The WHO estimates that children account for around 500,000 new cases of TB annually and that up to 74,000 children die from TB each year. In South Africa, approximately 15-20% of all TB cases occur among children, and TB is among the top five underlying causes of death in children under 15 years of age. Experts agree that the reported number of childhood TB cases likely underestimates the actual burden of TB in children. Identifying and diagnosing TB and MDR-TB in children remains difficult, as the disease may present non-specific symptoms among children. Furthermore, routine diagnostic tests for TB are not child friendly, as it is difficult to collect sputum specimens from infants and young children. Laboratory tests used to find TB in sputum are less likely to have a positive result in children (as children are more likely to have TB disease caused by a smaller number of bacteria). The USAID TB Program South Africa has worked with the National TB Control Programme to raise awareness of the issue of childhood TB and developed focused interventions to address the prevention, diagnosis, and treatment of TB in children.

Assessing Current Practices of Childhood TB Management

TB Program South Africa developed a TB in children baseline assessment tool designed to 1) assess the current status of pediatric TB and MDR-TB case detection and management in selected health facilities supported by the project, and 2) identify needs for improvement/strengthening of pediatric TB and MDR-TB management at the health facility level. In 2013, this tool was implemented in 20 selected health facilities. Results of this assessment indicated strong use of isoniazid-preventive therapy (IPT); however, areas of needed improvement included a current lack of demand for TB services for children, weak child contact tracing and evaluation systems, limited clinical management skills of health care workers, and diagnostic difficulties.

Building Health Worker Capacity

The primary care level has an important role to play in the diagnosis and initiation of treatment for many cases of childhood TB. Service providers at primary health care clinics need to be trained on TB screening, diagnosis, and treatment, as well as the proper referral and reporting mechanisms. To assist in these efforts, TB Program



South Africa provided need-based trainings for health care staff at all levels of the system, including community health workers, on basic TB management; TB/HIV, provision of antiretrovirals to co-infected patients, programmatic and clinical management of drug-resistant TB, laboratory diagnosis of TB and DR-TB; and advocacy, communication, and social mobilization (ACSM). TB Program South Africa developed a job aid for health care workers to improve their knowledge and management of TB in children.

Raising National and Community Awareness of TB in Children

Mass Media Public Service Announcements (PSAs): Most cases of TB in children occur in those with a known contact who has been diagnosed with TB, frequently a parent or another close relative. Therefore, in addition to developing the capacity of health care workers to properly diagnosis and treat TB in children, there is a critical need to mobilize communities and families to address TB in children. TB Program South Africa actively engaged in ACSM activities focused on TB in children. In conjunction with mass media partners, the project released a public service announcement (PSA) aimed at alerting parents and relatives to the need to access health services if a child has been exposed to TB.

Advocacy at the National TB Conference: USAID TB Program South Africa took the opportunity to highlight TB in children at the 4th annual National TB conference, which was held in Durban from June 10-13, 2014. On June 10, 2014, in the run up to the conference, the TB Program South Africa hosted a "We Beat TB in Children" walk in partnership with the mayor of eThekwini district of KwaZulu-Natal. This event promoted awareness of TB in children and linked with a conference satellite session facilitated by the project entitled "We Beat TB in Children: Getting to Zero TB Deaths in Children." At the project exhibition booth, conference participants were given the opportunity to learn more about TB in children and take a pledge to help stop TB in children—and 951 attendees signed up to do so.

National Summit on Diagnosis of TB in Children: On September 18, 2014 the USAID TB Program South Africa, in collaboration with the Department of Health and University of Pretoria, hosted a one-day seminar to address the diagnosis of TB in children, bringing together 80 experts at the Council for Scientific and Industrial Research (CSIR) in Pretoria. The theme of the event, "Childhood TB: The Elephant in the Room", aptly captures the nature of pediatric TB—overlooked in the past but increasingly recognized as an important challenge for National TB Control Programs to address. The summit sessions focused on current gaps in diagnosis of TB in children, key issues of regulation and standardization, access and affordability, priorities for operational research, and development of public-private partnerships to further support the development of TB diagnostics. The final portion of the summit focused on advocacy—building the momentum to get to zero TB transmission in children—by asking if children are receiving the attention they deserve and if policy is effectively translating into practice. Participants explored ways to raise community awareness of TB in children and to improve the management of childhood TB at the facility and community levels.

USAID TB Program South Africa pledges to stop TB in children at the 4th South Africa TB Conference in 2014

The notification of the child TB cases under seven has been increased from 8% to 10% between 2010 and 2013, while total TB case notification has decreased in the country from 401,048 in 2010 to 330,000 in 2013. Overall, the project has contributed to improvement of childhood TB management in the country, although still are some challenges to overcome.

Summary and Future Directions for TB Programs in South Africa

Key Challenges Experienced for TB Control in South Africa in General

Timeliness and quality of data: The project worked with provincial and district personnel over the life of the project to support them to tackle persistent challenges related to timely and accurate recording and reporting of TB data. During the life of the project, the NTP underwent a transition from an older version of the ETR.Net which in some cases led to challenges in exporting and reconciling treatment outcomes; for example, following the initial transition cure rates in provinces such as Mpumalanga dropped significantly as a high proportion of patients were misclassified as not evaluated, although they had outcomes. To rectify this problem, data had to be recaptured in the older version so that the ETR reports could be generated and reported accordingly. The project team also helped to address other issues reported with regards to the ETR.Net 2.0 version such as the inability to generate facility reports at the sub district level, which made it challenging to identify poor performing facilities for targeted interventions, and the inability to capture TB/HIV information on CPT and CD4.

Data quality and verification at facility level remained a challenge over the course of the project. Generally all challenges related to both the versions of ETR.net system were routinely raised at the Provincial and eventually NTP levels for further rectification with the next ETR version iterations, and in collaboration with the ETR.net system developer changes were made.

Bacteriological coverage (BC): Success in meeting bacteriological coverage targets varied during the life of the project, related to a number of factors including the introduction and roll out of new diagnostics tests such as GeneXpert. During the initial phases of GeneXpert rollout, the absence of revised guidelines and diagnostic tools led in many cases to the incorrect implementation of the new testing algorithms or the lack of or improper recording and reporting of data. To correct this, the project provided training on proper incorporation of GeneXpert and printed and distributed reporting tools. Districts were closely monitored regarding their rates of BC, and weak performing districts were targeted to receive intensified support according to tailored turnaround strategies, which included the strengthening of TB focal points in hospitals in these districts and sub districts to reduce the numbers smears not done pretreatment and improve the bacteriological coverage.

Other patient management challenges: The project encountered other periodic challenges related to gaps in performance on specific indicators. For example, in Year 4 challenges related to high rates of lost-to-follow were identified in NMBHD, Ramotshere Moiloa, Mahikeng, Amathole, eThekwini, Mangaung and Cape Winelands. To address this, the project team identified NGO partners in the specified areas which could be linked to facilities, enabling them to work closely with the facilities to impact on the loss to follow up. The introduction of TB appointment diaries by the project in supported districts also helped to reduce rates of lost-to-follow up, as it enabled quick identification of TB patients who missed their clinic appointment by nurses and tracer teams.

Other implementation challenges: The TB program experienced occasional challenges related to specific events which took place during the project period and effected the ability to conduct routine implementation in unavoidable ways. For example, the period around the 2010 World Cup, while a great event for the country, nonetheless affected project activities as long distance travelling was suspended for several months. Similarly the extended strike by National Public workers strike impacted project activities in all districts when it occurred, leading to many activities being delayed or cancelled. During this time, the project was able to assist the National Department of Health to alleviate the impact of the industrial action among TB patients by assisting patients

to get their TB medication through various means and in some areas performing clinical work in the TB wards. In Amathole and NMBM (Eastern Cape), provincial staff assisted the Provincial TB Directorate by conducting home visits to MDR-TB patients who were given pass out during the industrial action and project staff administered the daily injectables in the homes of MDR-TB patients in URC and non-URC supported facilities. All postponed activities in the provinces were eventually rescheduled to take place in the last quarter of the financial year, and the Project managed to reach the USAID targets. Other challenges experienced during the life of project related to periodic unavailability of INH at the facility level, resulting in the slow implementation of IPT.

High staff turnover: The high turnover of staff at management and at implementation level in supported facilities continue to be a challenge with consistent application of reforms (guidelines and SOPs) being jeopardized. The program has in turn sought buy in from districts to develop structured orientation and handover schedules to minimize the impact of staff turnover. This requires policy adoption at national level for consistent adoption throughout the country.

Priority Actions for Future TB Programs

Based on implementation experience, the USAID TB Program South Africa sees the following as emerging critical areas that will need to be effectively addressed for South Africa to achieve its long-term TB control and prevention goals.

Addressing TB/Diabetes co-morbidity: Recent studies have confirmed that the risk for TB is three times higher in people with diabetes mellitus (DM) than in those without the disease. Patients with TB/diabetes co-morbidity also experience worse TB treatment outcomes. South Africa has the third highest number of new TB cases in the world, with approximately 350,000 cases notified in 2012. Furthermore, an estimated 3.5 million South Africans (6% of the population) suffer from diabetes, and this number is expected to grow in the coming decades. This increasing prevalence of diabetes threatens to undermine progress made in combatting TB in the country. In South Africa, there is now a push to more effectively integrate TB and diabetes services, ensuring that TB patients are routinely screened for diabetes and diabetes patients are routinely screened for TB. An integrated approach to TB/diabetes diagnosis, care, and treatment is needed to address these dual epidemics and improve patient treatment outcomes.

Providing palliative care for TB patients: Palliative care is increasingly recognized as an essential part of all healthcare systems, yet remains underdeveloped in most parts of the world. Palliative care seeks to improve the quality of life of patients and their families facing problems associated with life-threatening illness, through the prevention and relief of suffering and treatment of pain and other physical, psychosocial and spiritual issues. In 2012, there were an estimated 450,000 incident cases of multidrug-resistant TB (MDR-TB) globally, and 170,000 deaths. Furthermore, an estimated 75% of MDR-TB cases went undiagnosed—adding to the spread and burden of this disease. Approximately 10% of MDR-TB cases have extensively drug-resistant TB (XDR-TB), and 92 countries have reported at least one case of XDR-TB. The cure rate of MDR-TB cases is currently below 50 percent—indicating that a large number of MDR-TB patients will require palliative care during treatment and end of life care if treatment fails. From a human rights perspective, access to palliative care for individuals with TB and DR-TB is a human right, which enhances quality of life and promotes dignity. From a public health perspective, access to palliative care for individuals with TB and DR-TB during treatment may improve treatment adherence, as palliative care can manage and/or reduce treatment side effects. If patients fail treatment and remain infectious, palliative care can help to ensure infection control and reduce continued DR-TB transmission.

Scaling up current efforts to address TB among vulnerable populations: This includes expanding current initiatives to address TB among mining populations, children, and prisoners. A community-based approach, similar to the USAID TB Program South Africa small grants model will help to ensure that innovative models of care reach these hard-to-reach populations.

Increasing the effective use of technology to address patient management and patient support issues: Numerous opportunities are emerging to incorporate practical technologies to tackle TB programmatic gaps, to facilitate and strengthen decentralized management of TB services, and empower patients to take informed action to prevent and manage TB. One example is a smart-phone based application that allows health workers to call up individualized treatment regimens for DR-TB patients, record DOT sessions, and flag reminders for follow up actions including side effect management and contact tracing. These and similar applications have broad applicability for home-based or clinic-based treatment, and can be tailored to include any relevant components of DOT, depending on local policies and SOP. Another area for practical use of technology includes use of e-supervision technologies for district and provincial managers. Use of online platforms to strengthen reach of trainings and as a resource for underserved communities should also be supported.

Increasing patient-retention and treatment outcomes: USAID and the NDOH will need to continue to build on TB Program South Africa's patient retention and treatment outcome strategies. This will include further expansion of mHealth and other tools by the program as well as engagement of ward-based outreach teams to provide TB DOTS. DR-TB patients will need to be serviced within their communities where feasible.

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