Quality of Tuberculosis Services Assessment in Ethiopia

Report

May 2020

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MINISTRY OF HEALTH - ETHIOPIA

MEASURE Evaluation

Quality of Tuberculosis Services Assessment in Ethiopia

Report

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May 2020

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Evaluation

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Cover

A health facility in Ethiopia. Photo: Team of Alishu Birra, SART

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FIGURES

TABLES

ABBREVIATIONS

ART	antiretroviral therapy
CPT	cotrimoxazole preventive therapy
DHIS2	District Health Information Software, version 2
DOT	directly observed treatment
DOTS	directly observed treatment, short course
DR-TB	drug-resistant tuberculosis
DS-TB	drug-sensitive tuberculosis
DST	drug susceptibility testing
EXPTB	extrapulmonary tuberculosis
FDC	fixed-dose combination
FM	fluorescence microscope
FMOH	Federal Ministry of Health
HEW	health extension worker
IPC	infection prevention and control
JSI	John Snow, Inc.
LPA	line probe assay
LTFU	lost to follow-up
M&E	monitoring and evaluation
MDR-TB	multidrug-resistant tuberculosis
NTLP	National Tuberculosis and Leprosy Program
OPD	outpatient department
PLHIV	people living with HIV
PPM-DOTS	public-private mix directly observed treatment-short course
QA/QC	quality assurance/quality control
QTSA	Quality of TB Services Assessment
RR-TB	rifampicin-resistant tuberculosis
SART	Sub-Saharan Africa Research and Training Center
SDG	Sustainable Development Goal
STR	shorter treatment regimen
TB	tuberculosis

TBCTA	Tuberculosis Coalition for Technical Assistance
TBL	tuberculosis and leprosy
TBL-NSP	TB and Leprosy National Strategic Plan
TFC	treatment follow-up center
TIC	treatment initiation center
TPT	tuberculosis preventive therapy
UN	United Nations
UNHLM	United Nations High-Level Meeting
USAID	United States Agency for International Development
WHO	World Health Organization
WPR	weekly progress report
XDR-TB	extensively drug-resistant tuberculosis

EXECUTIVE SUMMARY

Background

Despite the significant progress made to eliminate tuberculosis (TB) as a public health burden, it remains the world's leading cause of morbidity and mortality from a single infectious agent. Ethiopia is among the 30 high-burden TB, TB/HIV, drug-resistant tuberculosis (DR-TB), and multidrug-resistant tuberculosis (MDR-TB) countries in the world. According to the 2019 World Health Organization (WHO) Global TB Report, the incidence of TB in Ethiopia was estimated to be 151 per 100,000 population, and the mortality was 22 per 100,000 population (WHO, 2019). TB treatment coverage was 69 percent in 2018, indicating that 31 percent of TB cases were missed. Among the 114,233 notified drug-sensitive tuberculosis (DS-TB) cases, 69 percent were pulmonary TB, of which 62 percent were bacteriologically confirmed (WHO, 2019). The incidence of rifampicin-resistant tuberculosis (RR-TB) and MDR-TB in 2018 was estimated to be 1.4 per 100,000 population, with 46 percent of cases being detected and enrolled in treatment (WHO, 2019). The treatment success rate for RR-/MDR-TB cases in Ethiopia is among the highest in the world, currently at 72 percent (WHO, 2019). The estimated TB/HIV coinfection rate in 2018 was 7 percent, with a rate of 91 percent for antiretroviral therapy (ART) coverage of TB/HIV coinfected patients (WHO, 2019). Provision of tuberculosis preventive therapy (TPT) for priority populations is still relatively low: 49 percent of newly enrolled people living with HIV (PLHIV) and 22 percent of children under five years of age with household contacts with bacteriologically confirmed TB cases were reported to initiate TPT (WHO, 2019).

The Government of Ethiopia has committed to accelerating the fight to end the TB epidemic by 2035 by endorsing the post-2015 Global End TB Strategy and the targets set by the United Nations High-Level Meeting. The Federal Ministry of Health's (FMOH) National Tuberculosis and Leprosy Program (NTLP) strategy aims to end the TB epidemic by reducing TB-related deaths by 95 percent and cutting incident TB cases by 90 percent between 2015 and 2035 (FMOH, 2013).

In 2019, MEASURE Evaluation, which is funded by the United States Agency for International Development (USAID), conducted a Quality of TB Services Assessment (QTSA) in Ethiopia, in collaboration with the NTLP and the Sub-Saharan African Research and Training Institute (SART), a local research organization contracted by MEASURE Evaluation. The purpose of the QTSA was to evaluate the quality of TB services in health facilities to identify the current quality of TB services and gaps in service quality. The study assessed three domains of quality of care: health facility *structure*, service delivery *process*, and service delivery *outcomes*. The results were used by the NTLP to inform the development of programs and interventions to improve TB service delivery. More information on QTSAs, including reports on and tools used in the assessments in other countries, may be found at the following link: https://www.measureevaluation.org/our-work/tuberculosis/quality-of-tb-services-assessments

Methods

The Ethiopia QTSA was a nationally representative cross-sectional study conducted at both public and private TB diagnosis and treatment facilities across Ethiopia from November to December 2019. One hundred and eighty-five (185) facilities were randomly selected from all nine regions and two city administrations using a stratified random sampling procedure. Four hundred and nine health facility TB staff

and 539 patients were surveyed to provide insights on the structure, process, and outcomes of TB service delivery. Patients included in the study were confirmed DS-TB patients, ages 15 years and older, who were visiting the health facility on the day of data collection. Data were collected from the study facilities using four tools developed for the QTSA by MEASURE Evaluation: Facility Audit, Provider Interview, Patient Interview, and Register Review. The four tools used for the Ethiopia QTSA are available at the following link: https://www.measureevaluation.org/resources/publications/tl-20-87/

Results

Sample Characteristics

Facility sample: The sample consisted of 185 health facilities. The majority (92%) were government-managed public facilities, and slightly more than two-thirds were in urban areas. More than three-fourths (78%) were health centers; 18 percent were hospitals (public and private); and 3 percent were small private clinics. All hospitals and private clinics were located in an urban setting, whereas health centers were split between urban (61%) and rural (39%) settings.

Provider sample: A total of 409 TB service providers were interviewed. Nearly 70 percent were clinicians, and 32 percent were health extension workers (HEWs) affiliated with one of the health centers sampled. The largest percentage of clinicians were registered nurses (35%), and the majority (88%) of the clinicians reported that they were the TB focal person at the facility, or a designated or delegated TB focal person.

Patient sample: A total of 539 DS-TB patients who were on treatment at the time of the assessment were interviewed. More than one-half (57%) of the patients were male; more than two-thirds (68%) lived in an urban setting; and almost two-thirds (64%) were 34 years or younger.

Structural Indicators

Availability of TB services: TB diagnosis services were available at almost all facilities surveyed, with 99 percent of the facilities reporting TB screening by clinical signs and symptoms, 97 percent reporting TB screening services for children, and 88 percent reporting that they provided clinical and/or laboratory diagnosis of TB. Almost all facilities initiated and managed DS-TB treatment. Twelve facilities were DR-TB treatment initiation centers (TICs), and one-third of the facilities managed patients on DR-TB treatment. Nearly three-quarters of the facilities (73%) also reported initiating and managing DS-TB treatment for children, and six of the TICs initiated DR-TB treatment for pediatric patients.

TB/HIV linkages: Nearly all facilities reported providing HIV testing and counseling to confirmed and presumptive TB patients (98% and 94%, respectively), and nearly 70 percent reported providing HIV care and treatment services to TB/HIV coinfected patients. Of the 128 facilities that reported providing HIV care and treatment services to TB/HIV coinfected patients, 85 percent provided TPT to PLHIV, 91 percent provided cotrimoxazole preventive therapy, 87 percent provided ART, and 75 percent provided viral load testing. Among the facilities assessed, 71 percent reported providing TPT to children under five years of age, and 46 percent reported providing it to children between ages five and 15 years, although tracking TPT coverage among older children was a relatively new requirement at the time of the study, and health management information system registers and tools had not fully been adapted.

Community linkages: Almost three-quarters of the facilities reported that they provided community-based directly observed treatment, short course through HEWs. More than 90 percent of the facilities that worked with HEWs reported that they provided several other services to TB patients, including adherence counseling and contacting patients who missed appointments. However, only 14 percent of the patients reported that they received one-on-one counseling from HEWs, and only 6 percent reported using a HEW as their treatment supporter. Similarly, although the majority of the facilities reported that their HEWs contacted patients who missed their appointments, only one-quarter of the HEWs reported undertaking this activity.

Laboratory services and infrastructure: To diagnose TB, most facilities used smear microscopy (96%), clinical evaluation (89%), and GeneXpert (Xpert MTB/RIF) (70%). A little more than one-half (59%) of the facilities reported diagnosing TB with x-ray, which is not part of the diagnosis algorithm in Ethiopia and is used at the discretion of the clinician. Although most facilities (90%) had onsite laboratories capable of doing smear microscopy, almost three-quarters reported that they used offsite laboratory services for GeneXpert. In fact, only 33 facilities had GeneXpert on site. Of the facilities that used an offsite laboratory for GeneXpert, 50 percent reported that they received results after two days, and 35 percent reported that they received results after three to seven days. Fewer than one-half (43%) of the facilities with onsite laboratories had conducted first-line drug susceptibility testing (DST) in the 12 months before the assessment.

Although nearly all facilities with an onsite lab had a fluorescence microscope (FM), just under one-half (49%) were equipped with functional FMs that had light-emitting diodes, and 76 percent had auramine stain available. More facilities relied on acid-fast bacilli by Ziehl-Neelsen (n=127) than on auramine stains. All but one of the facilities that reported having GeneXpert onsite had at least one functional GeneXpert module, but only 88 percent (n=29) had at least one valid Xpert MTB/RIF cartridge available on the day of the assessment. Among the facilities with onsite laboratories, only 11 percent had a functional biosafety hood or cabinet.

TB drug availability: The survey assessed the availability of first-line TB treatment drugs and drugs for TPT (isoniazid) at all study facilities, and the availability of second-line treatment drugs at DR-TB TICs. The first-line standard treatment regimen, consisting of the four-drug fixed-dose combination (FDC) (FDC-4) tablets (i.e., RHZE 150/75/400/275 mg) used during the intensive phase, was found at 94 percent of the facilities, and the two-drug FDC (FDC-2) (i.e., RH 150/75 mg) used during the continuation phase was found at 85 percent of the facilities. All 12 TICs had the shorter treatment regimen drugs available. However, only 11 of 12 facilities had ethambutol 400 mg, and only 10 facilities had amikacin 500 mg/2 ml on the day of the assessment. Stockouts of isoniazid 100 mg were found at the majority of the facilities (72%).

TB infection control: Overall, more urban facilities followed standard infection prevention and control (IPC) practices compared with rural facilities, and more hospitals followed standard IPC practices compared with health centers. More than three-quarters of the facilities asked patients about coughing (87%) and had waiting areas that were either outdoors or indoors with access to continuous fresh air (75%). However, only between one-half and three-quarters of the facilities had a staff member designated as an IPC focal person (77%), implemented a cough triage system (68%), had surgical masks available for presumptive and confirmed DR-TB patients (56%), and had a cough monitor or designated person to assist with triage of coughing patients (52%). Fewer than one-half of the facilities had supplies, such as tissues for coughing patients (48%), had a separate waiting area to isolate potentially infectious people (47%), and had a system in place to screen and evaluate staff for TB disease (37%). Nineteen of the 69 facilities that reported having a

staff screening system reported that they had a staff member diagnosed with active TB disease in the past year.

Waiting time: Patients were asked about the amount of time that they spent at the health facility during a typical visit for TB services, including time spent at the outpatient department (OPD)/triage, laboratory, pharmacy, etc. On average, patients reported waiting 21 minutes to see a clinician(s) and an average of 24 minutes with the clinician(s).

Process Indicators

Patient-provider interactions and perceptions of services: TB care providers, including clinicians and HEWs, were asked questions about their case management practices and how they interacted with TB patients. When asked how they built rapport with patients, most (82%) indicated that they tried to communicate clearly and worked to ensure that their patients thought that they were being treated with dignity and respect (75%). More than 65 percent of the TB clinicians, and slightly more than one-half of the HEWs mentioned that they established trust with their patients by listening carefully and trying to show that they cared during the counseling sessions. A smaller proportion of TB care providers (58%) reported that they tried to remain open-minded about their patients' cultural beliefs, worked to understand the patients' fears about TB (36%), and suggested behavior changes to reduce the risk of transmission (36%) during counseling.

The results showed some discrepancies between the TB services that providers reported providing to patients and the services that patients said that they received. For example, more than two-thirds of the facilities reported providing some form of psychosocial support to TB patients, including one-on-one counseling by clinicians. By contrast, only one-half of the patients reported receiving one-on-one counseling from clinical staff, and 14 percent or fewer reported receiving counseling from HEWs, peers, or a psychologist.

Patient TB knowledge: Patient knowledge about TB was generally good. More than 80 percent of the patients were able to correctly identify the major symptoms of TB. More than one-half of the patients were able to correctly identify the causes and modes of TB transmission.

Stigma and discrimination: TB patients were asked about their perceptions of experiencing stigma or discrimination from healthcare workers, their community, and themselves. Between 10 percent and 17 percent of the patients agreed with statements about being negatively treated by health facility staff because they had TB. Patients perceived even higher levels of stigma from their communities. About one-quarter of the patients agreed with statements about being negatively treated by their community after being diagnosed with TB. The highest levels of stigma reported by patients was self-stigma. More than one-third of the patients indicated that they were careful about who they told that they had TB, and about one-quarter reported feeling ashamed and guilty that they had TB.

Barriers to accessing care: Among the patients who received diagnosis tests, 75 percent reported paying for x-ray and 27 percent reported paying for a sputum test—services that should be free of charge. Moreover, a small proportion of the patients interviewed (5%) reported that they had to pay to see a healthcare provider for routine TB visits, and 4 percent reported that they were unable to access the health facility because of costs, such as transportation or the cost of medical care.

Patient satisfaction: Overall, the results showed that the TB patients were satisfied with the TB services that they received from the heath facilities, with 89 percent reporting that they were either satisfied or very satisfied. However, the study revealed large gaps of upwards of 50 percent between the services that patients said that they received and what they wanted in terms of different TB supportive services, including nutritional support, transport assistance, and home-based treatment.

Outcome Indicators

TB diagnosis and linkage to care: Almost one-half of the patients interviewed said that they were initially tested for TB at a different public facility from where they were receiving treatment at the time of the study, and 24 percent said that they were tested at a different private facility. Only 30 percent reported being tested at the same facility where they were receiving treatment.

Diagnosis outcomes: The QTSA reviewed the outcomes of 10,787 presumptive TB patients who were registered at the TB clinic in either the Outpatient Register or the Presumptive TB Register, depending on which tool was being used at the facility. Of these, 58 percent (n= 6,264) had some type of diagnosis evaluation conducted (i.e., smear microscopy, GeneXpert, chest x-ray, or clinical assessment). Eighty-nine percent had a bacteriological confirmation test (i.e., either smear microscopy or GeneXpert), and the remaining 11 percent were evaluated through clinical means, including clinical assessment and/or chest x-ray Most patients who received a bacteriological confirmation test (91%) had the test results recorded, with 17 percent of the tests being positive. Fifteen percent of the patients who had some type of diagnosis evaluation conducted had a clinical assessment, with 25 percent resulting in a clinical diagnosis of TB.

The study also assessed outcomes for 12,768 diagnosis smears submitted to the laboratory registered in the TB Microscopy Register, and 24,092 GeneXpert samples submitted to the laboratory registered in the GeneXpert Lab Register. Nearly all (95%) of the diagnosis smears submitted to the laboratory had results recorded; however, only 18 percent of the results were recorded within 48 hours of submission. The smear tests had a 7 percent positive yield overall. Almost all (99%) of the GeneXpert tests submitted to the laboratory had results recorded, 41 percent within 24 hours of submission. One percent of the results were positive, 2 percent resulted in error, 1 percent were invalid, and 2 percent had no results.

Overall, diagnosis outcomes were difficult to assess because of limited data availability and completeness. There was no standardized national presumptive TB register, and the general OPD Register that most facilities were using was not TB-specific, and the TB data elements in the register were often not completed by facilities. The quality of data in the laboratory registers also had specific weaknesses that affected the accurate calculation of some of the diagnosis outcome indicators.

TB treatment outcomes: DS-TB outcomes were evaluated for 5,244 patients who started treatment between December 30, 2017 and June 27, 2018 using the Unit TB Register. DR-TB outcomes were evaluated for 298 patients who started treatment between June 28, 2016 and May 28, 2017 using the DR-TB Treatment Register. The treatment success rate for the DS-TB patient cohort was 83 percent. Fewer than 1 percent failed treatment, 3 percent died during treatment, and just under 1 percent were lost to follow-up (LTFU). Another 13 percent of the patients did not have any outcome recorded, pointing to a data quality gap. The treatment success rate for DR-TB patients was 70 percent. Three percent of the patients failed DR-TB treatment and were moved to pre-extensively drug-resistant (XDR) TB treatment; 10 percent died during

treatment; and 11 percent were LTFU. Another 6 percent did not have an outcome recorded in the register by the twenty-fourth month since treatment initiation.

TB preventive therapy outcomes: TPT completion was assessed for 2,140 PLHIV and 455 children under five years of age who were recorded as starting a six-month regimen of isoniazid between December 30, 2017 and June 27, 2018, in the ART Register and Contact Screening Register, respectively.

Two-thirds of PLHIV who were initiated on TPT were recorded as completing the regimen; approximately 1 percent of the patients developed active TB and were put on TB treatment; another 1 percent died while on TPT; and 11 percent were LTFU. Twenty percent of the patients did not have any outcome recorded.

Among children who were initiated on TPT, 30 percent were recorded as completing the regimen; fewer than 1 percent stopped TPT owing to adverse events; 7 percent were reported as LTFU; and another 3 percent had other outcomes. The majority of the children (60%) did not have any outcome recorded.

The register review revealed serious data quality challenges for TPT, especially the data for children on TPT. The data sources were often unavailable or incomplete. The high rates of LTFU and outcomes not recorded indicated weak monitoring and follow-up. Last, the study found an issue with the consistent availability of medications for TPT, such as isoniazid, which was available at only 28 percent of the facilities assessed; this may have contributed to the poor outcomes.

Conclusion

The Ethiopia QTSA results showed both strengths and weaknesses in the quality of the NTLP's TB program. The study showed strengths in terms of the availability of key TB services, including diagnosis, treatment, and follow-up; the availability of TB treatment drugs; good treatment success rates for DS- and DR-TB patients; and high levels of patient satisfaction. The study also identified programmatic gaps, for example, in the availability of rapid diagnosis tests, TPT coverage, and proper recording and documentation across the multiple registers used to capture and report TB-related data. These findings provide evidence of the key elements that the NTLP should target to improve the availability of high-quality TB care services across Ethiopia and optimize patient treatment outcomes. A stakeholder data review meeting was conducted in Addis Ababa in February 2020, at which the key findings were shared with the NTLP and recommendations were collaboratively prepared.

INTRODUCTION

Background

Tuberculosis (TB) is a communicable disease, one of the top 10 causes of death worldwide, and the leading cause of death from a single infectious agent, ranking above HIV/AIDS. Globally, an estimated 10 million people developed TB disease in 2018 and there were an estimated 1.4 million deaths from TB (1.2 million among HIV-negative people and an additional 251,000 deaths among HIV-positive people) (WHO [World Health Organization], 2019). Multidrug-resistant tuberculosis (MDR-TB) is now a serious threat to global health security, adding to the growing burden of antimicrobial resistance. In 2018, there were about one-half a million new cases of rifampicin-resistant TB (RR-TB), but only one in three cases were reported by countries to have been treated. Globally, 3.4 percent of new TB cases and 18 percent of previously treated cases had MDR- or RR-TB (WHO, 2019).

To address the worldwide TB burden, the WHO's post-2015 End TB Strategy set the following global targets for 2030: (1) 90 percent reduction in the number of deaths due to TB; (2) 80 percent reduction in TB incidence between 2016 and 2030; and (3) zero percent of TB-affected households experiencing catastrophic costs because of TB (WHO, 2015). The United Nations (UN) Sustainable Development Goals (SDGs) also address TB, especially SDG 3 ("Ensure healthy lives and promote well-being for all at all ages"), which specifies that the TB epidemic should be ended by 2030. Aside from reducing the incidence rate of TB, the SDGs promote addressing TB under the universal health coverage framework. To strengthen implementation and monitoring, SDG 17 ("Strengthen the means of implementation and revitalize the global partnership for sustainable development") aims to increase the availability of data, including appropriately disaggregated data (UN, 2012).

Although these global initiatives and country actions have resulted in a decreased TB burden in many countries, the decline in incidence was slower than required to meet the End TB Strategy targets. Recognizing that the world as a whole was not on track to reach the 2020 milestones of the strategy, in September 2018, the United Nations High-Level Meeting (UNHLM) on TB set the stage for high-level attention and action on TB. The meeting resulted in the adoption of a Political Declaration on Tuberculosis, reaffirming the commitment of countries to end the TB epidemic globally by 2030. The political declaration included four new global targets: treat 40 million people for TB disease in the five-year period 2018–2022; reach at least 30 million people with TB preventive treatment for a latent TB infection in the five-year period 2018–2022; mobilize at least US$13 billion annually for universal access to TB diagnosis, treatment, and care by 2022; and mobilize at least US$2 billion annually for TB research (UN, 2018).

To help countries achieve these targets, the United States Agency for International Development (USAID) established the Global Accelerator to End TB, a new business model to build on and accelerate previous strategies to assist high TB burden countries to develop programs to achieve an accountable, responsible, and inclusive TB response to meet the UNHLM commitments and targets. The initiative includes investments to improve access to high-quality, patient-centered TB, TB/HIV, and drug-resistant tuberculosis (DR-TB) diagnosis and treatment services (USAID, n.d.). To ensure that these investments are effective, USAID recognized the need for detailed data on the quality of TB services in a systematic way across the high burden countries in which it is providing financial and technical support to national TB programs. As such, the USAID-funded MEASURE Evaluation was asked to conduct a series of quality of TB services assessments

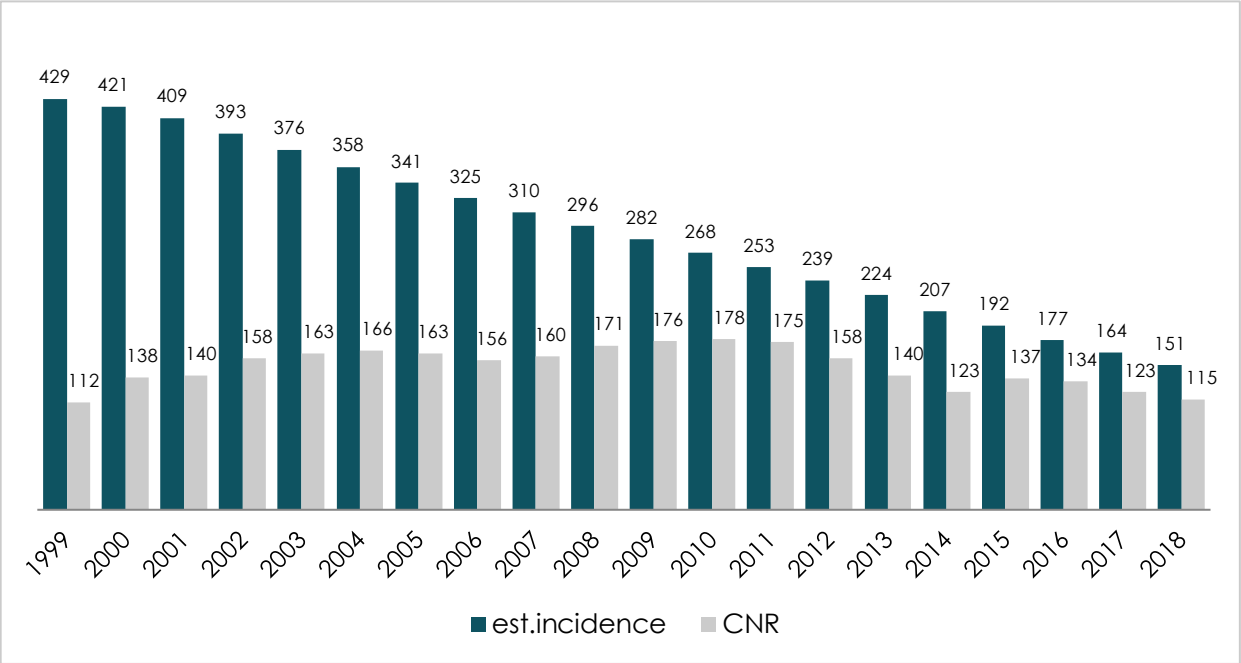
(QTSAs) to establish baselines for the examination of improvements in TB service quality. This report describes the findings of a 2019 QTSA conducted by MEASURE Evaluation, in collaboration with the Ethiopian National Tuberculosis and Leprosy Program (NTLP), to identify areas of strength and weakness in service quality, and ultimately, to provide the Federal Ministry of Health (FMOH) with information that it can use to ensure that the health system provides quality TB services.

Tuberculosis Response in Ethiopia

Ethiopia continues to be among the 30 high burden TB, TB/HIV, and DR-/MDR-TB countries in the world. According to the 2019 WHO Global TB Report, the incidence of TB is estimated to be 151 per 100,000 population and the mortality is 22 per 100,000 population (WHO, 2019). These figures remain high despite commendable efforts by the NTLP, which have resulted in a steady decline in incidence over the years. TB treatment coverage, derived from new and relapse notified TB cases divided by estimated incidence, was 69 percent in 2018, indicating that 31 percent of TB cases were missed. Among the 114,233 notified drug-sensitive (DS) TB cases in 2018, 69 percent were pulmonary TB. Of the nationally notified pulmonary TB cases, 62 percent were bacteriologically confirmed (WHO, 2019).

Figure 1 from the National Strategic Plan for Tuberculosis and Leprosy Control (FMOH, 2017c), shows a remarkably steady decline in the estimated number of TB cases and a decline in case notifications since 2010.

Figure 1. Trends in the estimated incidence of TB per 100,000 population and case notification rate in Ethiopia



Source: Federal Democratic Republic of Ethiopia, Ministry of Health, 2017c

In 2018, the incidence of RR-/MDR-TB was estimated at 1.4 per 100,000 population, with 0.7 percent of new and 16 percent of previously treated TB cases estimated to be MDR-/RR-TB (WHO, 2019). Forty-six percent of the estimated RR-/MDR-TB cases were detected and enrolled in treatment in 2018 (WHO, 2019).

National capacity for RR-/MDR-TB detection and treatment has improved following substantial investments in the rollout of GeneXpert machines for DR-TB detection, increased drug susceptibility testing (DST) coverage for previously treated cases, expanded TB culture and DST at regional laboratories, and the expansion of RR-/MDR-TB treatment initiation centers (TICs), leading to the rapid enrollment of detected cases in treatment. In 2018, 80 percent of new and 100 percent of previously treated bacteriologically confirmed TB cases were reported to have access to RR testing, respectively (WHO, 2019).

The treatment success rate for RR-/MDR-TB cases in Ethiopia is among the highest in the world, currently at 72 percent (WHO, 2019). The estimated TB/HIV coinfection rate in 2018 was 7 percent, with 91 percent antiretroviral therapy (ART) coverage of TB/HIV coinfected patients (WHO, 2019). The provision of TB preventive therapy (TPT) for priority populations is still relatively low: 49 percent of newly enrolled people living with HIV (PLHIV), and 22 percent of children under five years of age with household contacts with bacteriologically confirmed TB cases were reported to initiate TPT (WHO, 2019).

Ethiopia is committed to accelerating the fight to end the TB epidemic by 2035, has endorsed the post-2015 Global End TB Strategy and the UNHLM targets, and has aligned its National TB Strategic Plan with the National Health Sector Transformation Plan. The National End TB strategy aims to end the TB epidemic by reducing TB-related deaths by 95 percent and cutting incident TB cases by 90 percent between 2015 and 2035 (FMOH, 2017c). The strategy calls for the use of robust TB case finding and rapid diagnosis technologies to

address the gap in finding missed cases and to decrease the threat of DR-TB. The NTLP has expanded TB services, through both public and private health facilities, to provide high-quality care (FMOH, 2019). The strategic focus is on providing care at the community- and health facility-levels to improve case finding. As of June 2018, all public hospitals and health centers provided TB services, and community TB care had been rolled out to most health posts.

The community TB strategy, which was incorporated in the Health Extension Program package, has proved feasible, acceptable, effective, and efficient. Health extension workers (HEWs) are tasked with identifying those with presumptive TB and referring them to health centers for diagnosis; providing treatment support; providing directly observed treatment, short course (DOTS) in some areas; tracing people lost to follow-up (LTFU); and carrying out contact investigation. This strategy has increased patient adherence and improved treatment outcomes.

Comprehensive public-private mix directly observed treatment-short course (PPM-DOTS) services, supported by the USAID-funded Private Health Sector Support Program, started in 2006. With support from this program, a mix of TB services are currently provided at 546 private health facilities across the country: 247 provide diagnosis and treatment services; 32 provide TB diagnosis and referral services; and 267 provide presumptive TB referral services. The PPM-DOTS initiative contributed 15 percent of the TB cases notified nationally in 2018, although it engaged fewer than 3 percent of the private health facilities in the country (FMOH, 2017b).

The NTLP strategy and national program are committed to improving access and providing equitable TB services to vulnerable and marginalized populations in places where the TB burden is concentrated. TB prevention, including management of latent TB, is a core strategy for ending TB in the country. Health systems strengthening, including monitoring and evaluation (M&E), supply chain management, quality-assured laboratory services, community-based services, human resource management, and research and innovation are key cross-cutting strategies to improve TB program performance.

The national budget estimated to be required for TB is US$94 million (WHO, 2019), of which more than one-half is unfunded. Donors and partners working with the NTLP to support TB elimination activities include the Global Fund to Fight AIDS, Tuberculosis and Malaria; WHO; USAID; the United States Centers for Disease Control and Prevention; Management Sciences for Health; Partners in Health; the German Leprosy and TB Relief Agency; KNCV Tuberculosis Foundation; Abt Associates and the Private Health Sector Support Program; Global Health Community; Clinton Health Access Initiative; International Center for AIDS Care and Treatment Program; Voluntary Health Services; Organic Health; professional societies, such as the Ethiopian Thoracic Society and the Ethiopian Pediatric Society; Consortium of Christian Relief and Development Association; and Médecins Sans Frontières.

Quality of TB Services Assessment

Conceptual Framework

Under the End TB strategy, TB programs have typically focused on improving access to services and have measured programmatic successes by looking at case detection, treatment coverage, and treatment success, and not as much on the quality of care provided at different levels of the health system. Although access is a necessary first step to improving health outcomes, it is not enough. Once a patient has accessed the system,

the services need to be readily available and applied skillfully by healthcare providers, who are cognizant of the importance of how the patient perceives the interaction with the health system. Quality can then imply optimizing material inputs (i.e., drugs, commodities, equipment) and provider skill to deliver services, resulting in positive health outcomes. Quality is "the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge" (Institute of Medicine, 2001).

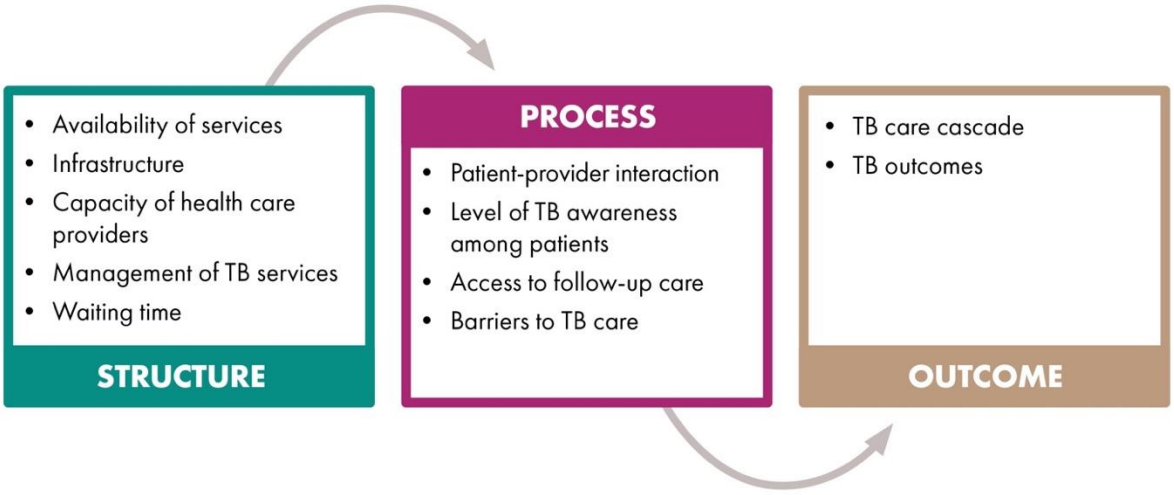
According to a systematic review conducted by Cazabon, et al., quality of care in both the public and private sectors falls short of international standards and urgently needs improvement. National TB programs need standards and a framework to enable them to systematically measure and improve the quality of TB services and invest in quality-improvement programs (Pai, 2014; Cazabon, et al., 2017). There is evidence that quality of care is linked to health outcomes, and that targeted quality improvement efforts can enhance the use of TB services and, ultimately, improve health outcomes. A study by Subbaraman, et al., showed that gaps in the cascade of TB services were linked to specific concerns about lapses in the quality of care at specific points in the cascade (Subbaraman, et al., 2016).

Studies have found that deficiencies in quality of care often result from gaps in provider knowledge, the inappropriate use of available technology, or the inability of health institutions to respond to changes in patient health needs (Ibrahim, et al., 2014; Mohanan, Goldhaber-Fiebert, Giardili, & Vera-Hernández, 2016). In recent years, our understanding of quality of care has improved because of the introduction of newer methodologies. For example, studies done by Das, et al., using the standardized patient methodology have cast doubt on the previous hypothesis that a lack of provider knowledge and capacity constraints are the major limiting factors in the accurate diagnosis and treatment of TB (Das, et al., 2015). By observing and documenting actual practice, which can be quite different from knowledge or stated practice, these types of studies reveal a big "know-do gap" in provider behavior, whereby providers have the knowledge but do not always translate this knowledge into actual practice (Das, et al., 2015; Subbaraman, et al., 2019).

One way to look at quality of care, which pulls these components together, is to view it as consisting of three key elements: *structure,* or the resources available at a health facility, or more generally in the healthcare system; *process,* or the interaction between the healthcare system and patients; and *outcomes,* or the consequences of care (Donabedian, 2005). The services that patients receive can be deficient at the structure, process, or outcome levels, thereby leading to poor quality of TB care. Because much of the existing global work on measuring quality of TB care has focused primarily on the process element, with some attention to the outcome element, this framework incorporates the added dimension of the structural element and the patient perspective on the care provided.

The assessment described in this report used the framework presented in Figure 2 to measure the quality of services offered by the national TB program in Ethiopia. The framework and the analysis of key indicators will inform policymakers and managers about the status of the quality of TB services and highlight ways in which services can be improved.

Figure 2. TB Quality of Care Framework



Source: Adapted from Donabedian, 2005

The framework provides a logical sequence, linking key components of quality of care, including policy and regulations, infrastructure, providers' competency, the service environment, and infection control that should function well to achieve the desired health outcomes. Using this model to measure the key data elements for each component provides policymakers and program managers with the information they need to identify problem areas and take action to improve the quality of TB service delivery. The key components and elements of quality care are:

- **Structure:** The availability and functionality of services and resources, including health facility infrastructure, medical equipment, supplies, and drugs; staff numbers and their characteristics; service providers' knowledge and skills; and other resources, such as funding payment schemes and incentives.
- **Process:** The interaction between service providers and patients during which structural inputs from the healthcare system are transformed into health outcomes, including patients' overall perception of the services and levels of satisfaction. Process is contextualized as "what is done" and "how it is done" (i.e., the actual delivery and receipt of care).
- **Outcome:** The consequences of care. Outcomes are measured in terms of the patients' health status in light of critical services received, such as proper diagnosis and the appropriateness of treatment regimens; adherence to treatment regimens; treatment outcomes; and ultimately, incidence, prevalence, and death rates.

More information on QTSAs, including reports on and tools used in the assessments in other countries, may be found at the following link: https://www.measureevaluation.org/our-work/tuberculosis/quality-of-tb-services-assessments

Study Objectives

The purpose of this study was to assess the quality of TB services in randomly selected TB diagnosis and treatment facilities in Ethiopia to identify areas of strength and weakness in terms of service quality. The results of the assessment will provide information to the NTLP to develop interventions to improve the quality of TB services, and will also provide baseline measurements of key TB service quality indicators to track improvements over time.

The study had the following objectives:

- Assess the current condition of TB care in terms of the availability of skilled providers, equipment, and organizational structure.
- Determine the quality of TB services provided by health facilities and gaps to address to improve service quality.
- Determine the quality of TB services provided by HEWs and gaps to address to improve service quality.
- Assess providers' knowledge and skills.
- Assess patients' perception of TB services and patient satisfaction.
- Evaluate treatment outcomes of DS- and DR-TB patients who received TB care.

METHODS

Study Design

This assessment was a nationally representative cross-sectional study conducted at both public and private TB diagnosis and treatment facilities in Ethiopia. The overall quality of TB services offered at the facilities was assessed by examining: the availability of services; the availability and functionality of resources (i.e., material and human) at the facilities; service providers' knowledge and skills; interactions between providers and patients; patients' overall perception of the services and levels of satisfaction; and TB treatment outcomes of DS-TB and DR-TB patients who received treatment during a specified timeframe.[1] International and national tuberculosis guidelines from the WHO and the NTLP, and the 2006 International Standards for Tuberculosis Care, developed by the USAID-funded Tuberculosis Coalition for Technical Assistance (TBCTA, 2006), were used as benchmarks to judge the overall quality of TB services offered at the facilities.

Sampling Procedures

Health Facility

A total of 185 health facilities[2] (171 public and 14 "other than public" facilities) from a NTLP list of the facilities that were providing TB diagnosis and treatment services during the year 2011 Ethiopian Calendar Hamle 1–Sene 30 (Gregorian calendar July 8, 2018–July 7, 2019) were selected using a stratified random sampling procedure (described below). The sampling frame was constructed by listing the facilities by region, management authority, and TB case load. All nine regions and two city administrations (i.e., Addis Ababa and Dire Dawa) were represented. Management authority was categorized as "Public/Government," consisting of all public health facilities, and "other than public," consisting of PPM facilities, private clinics, facilities managed by non-governmental organizations, as well as facilities and clinics affiliated with universities. TB caseload was defined as the total number of DS-TB and DR-TB cases notified by the health facilities.

In the first stage of sampling, two strata were created, one for "special interest facilities"[3] (n=2) and another for randomly selected facilities (n=173). The two special interest facilities selected were large hospitals providing specialized TB services. Next, the 173 randomly selected facilities were proportionally distributed to the regions and management authority by TB caseload, resulting in an overall distribution that consisted of 171 Public/Government facilities and four "other than public" facilities (including the two special interest facilities).To allow for better representation of the broad "other than public" category, the sample size was increased by 10, for a total of 14 facilities.[4] The 171 public/government facilities were distributed across the

[1] For DS-TB patients, outcomes for patients who started treatment between December 30, 2017 and June 27, 2018 were reviewed. For DR-TB patients, outcomes for patients who started treatment between June 28, 2016 and May 28, 2017 were reviewed.

[2] Although a larger sample would have been ideal, the study budget capped the total sample size. It was decided with the NTLP that the assessment would focus on primarily on public facilities, but would also include a small number of private facilities.

[3] The criteria for the special interest facilities included the following: (1) federal hospitals that had direct communication with the FMOH; (2) the first hospitals that had started MDR-TB initiation and new drug regimens; and (3) the only two hospitals that provided tuberculosis and leprosy (TBL) training.

[4] The sample of "other than public" facilities was increased to achieve a broader geographic spread.

facility types[5] included in the study in each region based-on caseload data. In the final stage, following the assigned sample size allocation for each stratum and applying probability proportional to size[6] sample selection method (size being TB caseload), the list of the facilities for the study was developed.

Service Providers

At each facility, one or more staff in charge of TB and TB-related services—often the TB Focal Person but sometimes also the facility head or another clinician—were interviewed. At facilities working with HEWs (i.e., health centers), the HEWs were asked, in advance, to report to the health center on the day of the assessment and were included in the provider sample. At small facilities, one or two staff delivering TB-related services were asked to participate, whereas at larger ones, up to four providers among those present on the day of the assessment were randomly selected to participate in the individual provider interviews. Two study tools (Facility Audit and Provider Interview, which are described in more detail in the Data Collection Instruments section below), were administered to the providers. The Provider Interview was conducted individually with each provider, whereas one Facility Audit was implemented per facility with different providers responding to specific sections of the questionnaire, depending on the content.

TB Patients

The views and perceptions of TB patients are important elements for the measurement of service quality because they influence whether patients access services for diagnosis, adhere to treatment regimens, and return to facilities for follow-up services. Although more studies are needed to clearly understand the complex relationship among service quality, service use, and treatment outcomes, it is presumed that patients shun what they perceive as poor-quality services despite the proximity of such services (Andaleeb, 2001). The patient perspective, obtained from patient interviews, was a critical component of this study for determining the quality of services that the TB program offers.

The patient sample consisted of confirmed pulmonary and extra pulmonary DS-TB cases who were on treatment and who visited the health facility on the day of data collection. DR-TB patients were not included in the sample because of safety concerns for the data collection teams. Patients who were too sick or too weak to be interviewed, based on the judgement of the data collector, were excluded from the sample. To the extent possible, the data collectors purposively selected a consecutive sample of three to five TB patients who were present on the day of data collection, using the inclusion and exclusion criteria that follow.

Inclusion Criteria for Patients

- DS-TB patients receiving TB treatment (regardless of whether they were in the intensive or continuation phase, and regardless of whether this was their first TB infection/treatment) at the facility for at least two weeks at the time of the assessment (or otherwise deemed not infectious).
- Patients ages 15 years and older
- Patients with either pulmonary or extrapulmonary TB (EXPTB)

[5] Small- and medium-sized private clinics, health center, primary hospital, general hospital, and referral hospital.

[6] Probability proportional to size sampling ensures that facilities with larger TB caseloads have a higher probability of being selected.

Exclusion Criteria for Patients

- DS-TB patients who had received fewer than two weeks of treatment
- Patients with DR-TB
- Patients under 15 years of age
- Patients visiting the health facility for the first time
- Patients who were too weak or ill to be interviewed
- Patients who refused to be interviewed
- Transferred-in TB cases, as indicated in the health facility treatment register

Data Collection Instruments

The study used four tools developed by MEASURE Evaluation, with input from the USAID TB Team in Washington, DC: (1) Facility Audit; (2) Provider Interview; (3) Patient Interview, and (4) Register Review (Figure 3). With support from the Sub-Saharan Africa Research and Training Center (SART), a local research organization based in Addis Ababa contracted by MEASURE Evaluation for the QTSA, the tools were adapted to the context of Ethiopia by consolidating input from the main stakeholders, the NTLP, and USAID/Ethiopia. The Facility Audit and the Register Review tools were translated into Amharic, whereas the Provider Interview and Patient Interview tools and consent forms were translated into Amharic, Oromifa, Somali, and Tigrigna. The tools were administered electronically on tablets, using SurveyCTO (Version 2.41; Dobility, 2019).

The four tools used for the Ethiopia QTSA are available at the following link: https://www.measureevaluation.org/resources/publications/tl-20-87/

The *facility audit* targeted structural factors and the process of providing high-quality care. The tool included questions on the availability and functionality of services and resources appropriate to the type of facility responding and the services that the facility reported providing. It covered the operational units of the facility, including the TB clinic, laboratory, and pharmacy. In some cases, especially at hospitals, where different providers manage different sections of the facility, multiple providers were interviewed to complete the tool. The facility audit required one to four hours to complete, depending on the facility and the availability of providers.

The *provider interview* collected information on the competencies and skills expected of different types of TB care providers and their interactions with patients. Completing the provider interview required one hour, on average. The *patient interview* focused on the perspectives of TB patients in terms of their experiences at the health facility and with their care providers. Completing the patient interview took one hour, on average.

The *register review* extracted aggregate data on specific TB prevention, diagnosis, and treatment outcome indicators. The indicators included presumptive TB cases, laboratory requests and results, and TB preventive and DS- and DR-TB treatment outcomes. The data collectors extracted data from primary source documents, including the Outpatient Department (OPD) Register, TB Microscopy Registration Book, Laboratory Register for GeneXpert MTB/RFA Assay, ART/HIV Care Register, TB Unit Register, DR-TB Treatment Register, and TB Contact Screening Register. At some facilities, source documents used by the facilities were

not standard; nevertheless, the data were extracted from the non-standard registers that were available. Depending on the caseload at the facility, the register review took five to six hours to conduct, on average. Figure 3 provides a summary of the four tools and the respective target variables/factors for the assessment.

Figure 3. Overview of the survey tools

Tool Pretest

The data collection tools were pretested at five health facilities: four in Addis Ababa and one in the Oromia region. The selection of pretest facilities incorporated all types of facilities included in the actual study sample, including a privately managed hospital and a facility with a DR-TB TIC.

A formal communication was sent to each facility head by SART requesting time from their staff and patients for the pretest of the QTSA tools. The pretest was conducted from September 30 through October 8, 2019 by SART and MEASURE Evaluation staff, with guidance from a NTLP staff member. The tools were iteratively improved by incorporating learning and making revisions on each successive day of the pretest.

After the completion of the pretest and finalization of the pretested versions of the four survey tools, the instruments were scripted using SurveyCTO. The electronic versions of the tools were tested for consistency against the paper versions, skip logic, and interface for field users and data capture. The electronic tools were piloted for four days, from October 24 to October 27, 2019.

Data Collection and Management

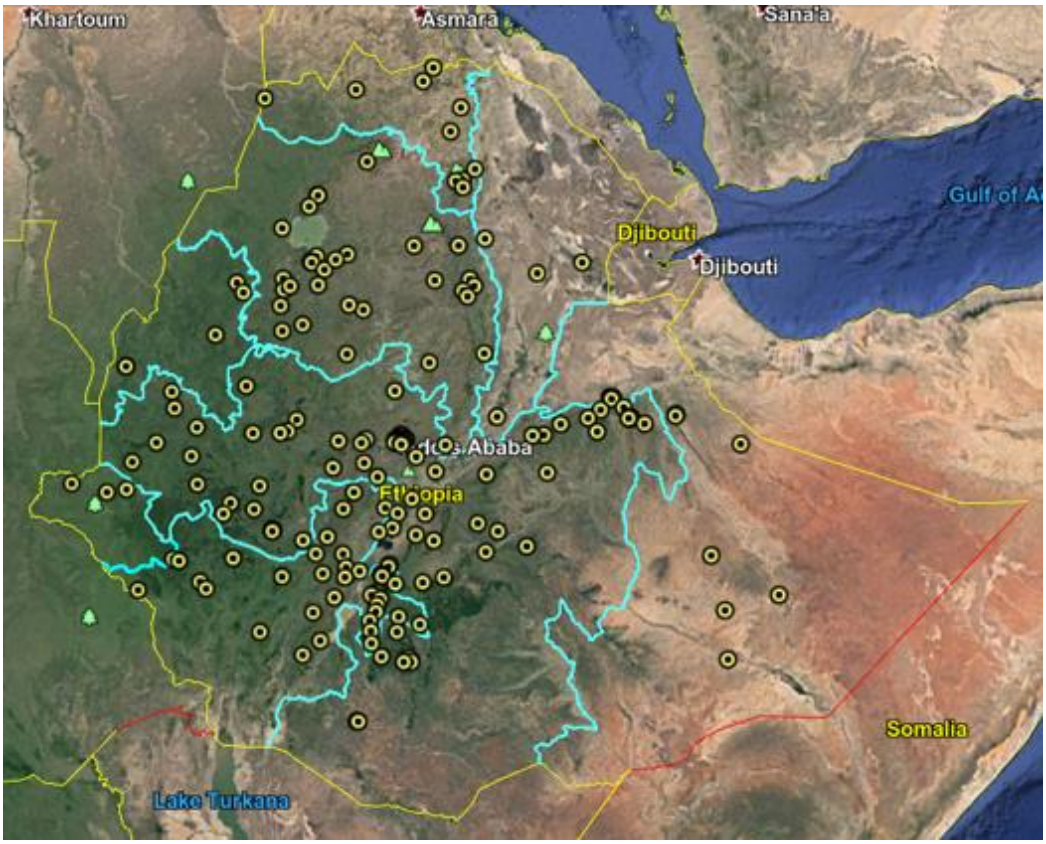
Data collection at the 185 facilities sampled in Ethiopia was conducted by SART. Figure 4 shows the GPS mapping of the health facilities surveyed. SART was responsible for the recruitment, training, and supervision of the data collectors, and the collection of all study data using SurveyCTO. Thirty-six data collectors formed nine data collection teams (27 enumerators and nine supervisors) assigned to cover the nine regional states and two city administrations (Figure 4). A training workshop was conducted in Addis Ababa from October 28 to November 2, 2019 for the data collectors and supervisors. It was facilitated by MEASURE Evaluation

and SART staff, with support from the NTLP, to train them on the survey questionnaires and the other technical and operational skills needed for the fieldwork.

The fieldwork lasted from November 11 to December 17, 2019. One day was required at each facility to complete data collection, on average. Informed consent was obtained from all participants before administering the tools. The data collection teams visited a total of 185 health facilities, 13 of which were replacement facilities (i.e., 7% of the total sample). The replacement facilities were selected only when security concerns or poor access prevented the teams from reaching facilities in the original sample, or when it was learned that facilities in the original sample were not providing TB-related services.

Data were captured electronically using SurveyCTO, which allowed for real-time data management through the use of data limits, skip logic, and required responses as the tools were being administered. Field supervisors performed initial checks for data quality and completion, then submitted the reviewed responses to the SurveyCTO server, where the data were further reviewed and cleaned by SART. Back-checking of a portion of patient and provider interviews was also conducted as a data quality assurance measure. More information about the data management processes is provided in Appendix A.

Figure 4. GPS mapping of the facilities surveyed



Data Analysis

The preliminary findings from the assessment were presented in January 2020 at a Stakeholder Consultation Workshop, at the request of the NTLP. The stakeholder consultation was part of the TB and Leprosy National Strategic Plan (TBL-NSP) review and revision process, related to the preparation of the TBL-NSP, 2020–2025. Although the results presented were preliminary, the information helped inform the TBL-NSP development process. Feedback from stakeholders also helped the study team identify the results that the NTLP was most interested in and how best to present them. Subsequently, a data review meeting was held in February 2020 with the NTLP, USAID/Ethiopia, SART, and MEASURE Evaluation for the purpose of validating the study results and discussing key insights and recommendations to put forward as a result of the study.

The data analysis was linked to the three domains of quality of care (i.e., structure, process, and outcome) described in the QTSA conceptual framework, with an emphasis on priority areas identified by the NTLP. After the completion of data cleaning, and the finalization and locking of the dataset, the data analysis was performed using STATA v14 software. Disaggregation of the variables in the four tools is reported in the Results section of this document.

Ethical Review

The ethical review for this study was conducted and approved by the John Snow, Inc. (JSI) institutional review board in the United States and the Armauer Hansen Research Institute/All Africa Leprosy and Tuberculosis Rehabilitation and Training Center Ethics Review Committee in Ethiopia.

RESULTS

This section presents the Ethiopia QTSA findings, which are organized according to the QTSA conceptual framework and the data needs prioritized by the NTLP. After a brief description of the characteristics of the health facilities, TB service providers, and patients sampled, the findings on the structural, process-related, and outcome-related indicators are presented. When appropriate, the findings are stratified by the type of health facility (e.g., hospital versus health center) and the location of the facility (urban/rural). Additional data are provided in tables in Appendix C.

Sample Characteristics

Facility Characteristics

One hundred eighty-five health facilities, selected from a sampling frame of the facilities providing TB diagnosis and treatment services (i.e., not a sampling frame of all facilities) and using the methodology described above, were included in the assessment. More than three-fourths (78%) of the facilities were health centers, followed by public hospitals (16%). Public and private hospitals made up 18 percent of the sample. The "Other" category (3%) consisted of small private clinics (Table 1).

The majority of the facilities (92%) were public facilities. Public facilities accounted for 91 percent of the urban sample and 97 percent of the rural sample (Table 1).

All public and private hospitals and other private clinics were located in urban settings, whereas health centers (n=145) were split between urban (61%) and rural (39%) settings (data not shown). All rural facilities in the sample were health centers (Table 1).

Table 1. Facility type and management authority, by location (N=185)

	Facility Location				Total	
	Urban		Rural			
	No.	%	No.	%	No.	%
Facility Type						
Public Hospital	29	22.7	0	0.0	29	15.7
Private Hospital	5	3.9	0	0.0	5	2.7
Health Center	88	68.8	57	100.0	145	78.4
Other	6	4.7	0	0.0	6	3.2
Management Authority						
Government/Public	116	90.6	55	96.5	171	92.4
Other Than Public	12	9.4	2	3.5	14	7.6
Total	128	100.0	57	100.0	185	100.0

The average monthly TB patient load (including presumptive TB patients and patients visiting facilities for ongoing treatment), as estimated by the healthcare providers interviewed, is presented in Figure 5 (and in Table C1.1 in Appendix C). As expected, the patient load was highest at public hospitals. Urban facilities served almost four times as many TB patients per month compared with rural facilities. In addition to patient load, the assessment looked at staffing at these facilities. As expected, higher-level facilities had a larger number of full-time and part-time staff dedicated to TB. On average, public hospitals reported having 12 full-time and one part-time health professionals who worked in the TB unit or interacted with TB patients, whereas health centers averaged six full-time and seven part-time staff working on TB (Table 2). These results should be interpreted with some caution because they reflected the knowledge, and often the best guess, of the provider interviewed. Moreover, although the public hospitals reported 12 full-time staff, this did not necessarily mean that they all worked in the TB unit at the same time. They could have worked in the TB unit on a rotational basis and be based in the general OPD. Overall, most facilities had only one to two healthcare providers working in the TB unit at a given period of time.

Figure 5. Average number of TB patients seen per month, by facility type and location (N=185)

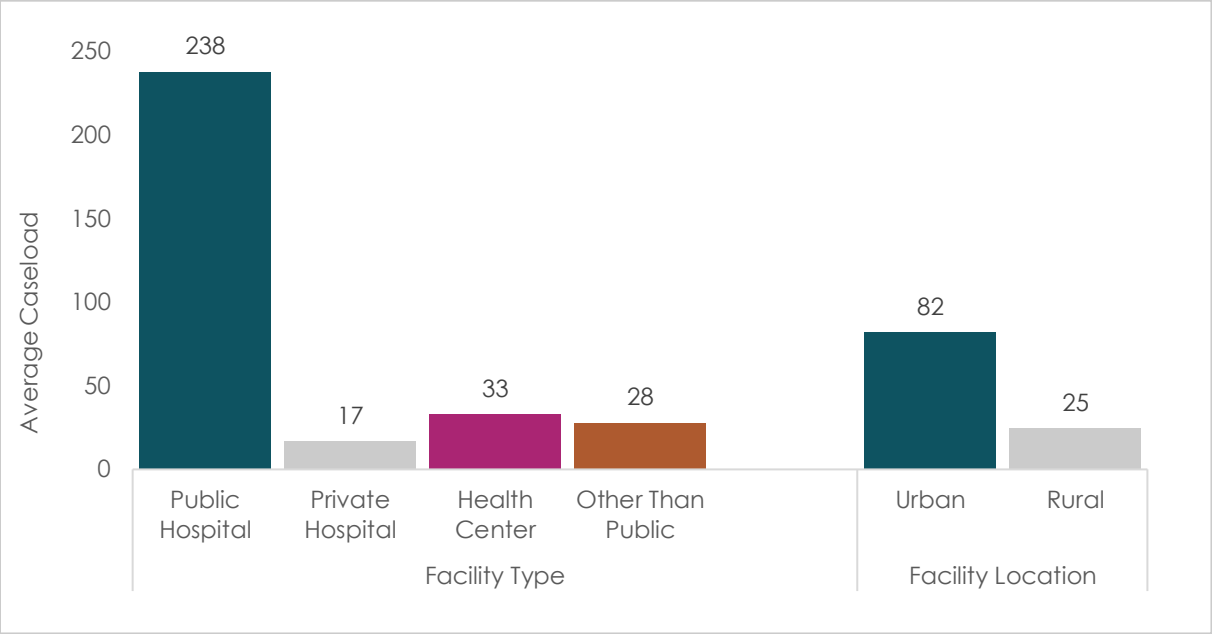


Table 2. Average facility staffing, by facility characteristics (N=185)

	Full-Time Clinical Staff	Full-Time Clinical TB Staff	Part-Time Clinical Staff	Part-Time Clinical TB Staff
Facility Type				
Hospital	274	12	6	1
Private Hospital	83	4	30	18
Health Center	29	6	9	7
Other Than Public	13	2	3	1
Management Authority				
Government/Public	71	7	8	6
Other Than Public	39	3	17	10
Facility Location				
Urban	92	7	11	7
Rural	16	4	8	5
All Facilities	69	6	10	7

Provider Characteristics

A total of 409 TB healthcare providers were interviewed. Nearly 70 percent of these providers were clinicians working at the health facilities sampled; the remaining 32 percent were HEWs affiliated with one of the health centers sampled (Table 3). Among the clinicians, the largest percentage were registered nurses (35%).

Slightly more than one-half of the providers (57%) had a health-related diploma, and 37 percent had the equivalent of a health-related bachelor's degree. The majority of the providers (65%) were 39 years old or younger, and the male-to-female ratio was four to five. The majority (88%) of the clinicians reported that they were either the TB focal person at the facility or a designated or delegated TB focal person at the time of assessment (data not shown).

Table 3. Provider characteristics (N=409)

Characteristics	No.	%
Healthcare Worker Occupation Category		
HEWs	129	31.5
Clinicians	280	68.5
Provider Education Level		
Diploma Health-Related Education	233	57.0
Bachelor's in Health-Related Field	152	37.2
Medical Doctor or Postgraduate in Health-Related Field	24	5.9
Provider's Sex		
Male	181	44.3
Female	228	55.7
Provider's Occupation Cadre		
HEW	129	31.5
Health Officer	65	15.9
Medical Doctor	23	5.6
Nursing Associate or Auxiliary	49	12.0
Registered Nurse	143	35.0
Age Group of Provider		
Below 35 Years	103	25.2
35–39 Years	161	39.4
40–44 Years	68	16.6
45 Years and Above	77	18.8
Mean (median) (range: 27–71)	39.6(37.0)	

Patient Characteristics

A total of 539 TB patients who were on treatment at the time of the assessment were interviewed. On average, slightly fewer than three patients were interviewed per facility. Four-fifths (80%) had pulmonary DS-

TB[7] and one-fifth (20%) had extrapulmonary DS-TB (Table C1.2). More than one-half (57%) of the patients were male, more than two-thirds (68%) lived in an urban setting, and almost two-thirds (64%) were 34 years or younger.

Almost three-fourths (70%) of the patients were educated beyond the primary school level, with one-fifth (20%) having a secondary school degree (data not shown). When asked about their employment status, more than one-third (37%) said that they were self-employed, 15 percent said that they were employed full-time, and 11 percent said that they were unemployed. The remainder said that they were either a student, retired, or a housewife/househusband (Table C1.2).

More than two-thirds (68%) of the patients got to the health facility on foot. More than three-quarters (78%) of the patients estimated that it took one-half hour or less to get to the facility; 12 percent estimated that it took more than one hour. Additional data on patient characteristics are provided in Table C1.2.

Structural Indicators

This section covers the factors that affect the context or enabling environment in which TB care is provided to patients. This includes the physical facility, equipment, human resources, and organizational characteristics, such as staff training and supervision. In this study, structure was measured by the availability of services, infrastructure, capacity of TB providers, and management of TB services.

Availability of TB Services

Overview of TB Services

Facilities were asked whether they had provided different types of TB services over the past year (although the questions did not specify whether the services were consistently provided to all patients all the time).

Almost all facilities reported screening adults and children for presumptive TB by clinical signs and symptoms, and nearly 90 percent reported providing TB diagnosis services (either clinical or laboratory) (Figure 6). Almost all facilities reported dispensing drugs for TB treatment, providing facility-based directly observed treatment (DOT) (98%), and providing TB treatment and follow-up in the intensive (98%) and continuation (99.5%) phases (Table C2.1).

Almost all facilities also reported giving one-on-one counseling to TB patients (99%). More than two-thirds of the facilities reported providing some type of psychosocial support to TB patients, including counseling by medical staff, peer support, and psychological support (by a psychologist) (Table C2.1).

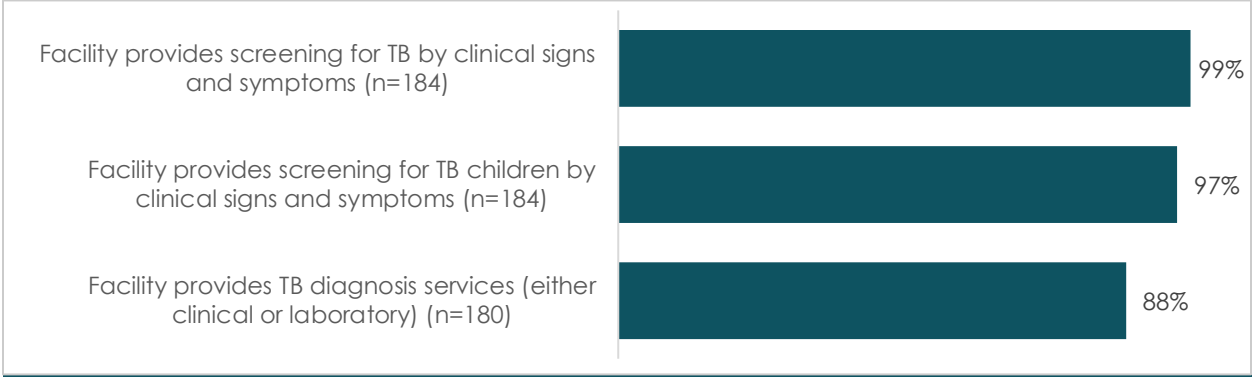
Most facilities reported tracking patients who missed appointments, including contacting them by phone, SMS, and home visits by HEWs, although the consistency of these services was not known. Nearly three-quarters (72%) of the facilities that reported working with HEWs said that they offered community-based DOT through the HEWs, and a similar proportion (78%) reported providing home-based treatment with treatment supporters (Table C2.1).[8] Forty percent said that they provided patient-managed home-based

[7] Also includes six patients who were coded as having DR-TB in the patient interview form. These patients were most likely miscoded. DR-TB patients were excluded from the patient sample because of the unavailability of masks for the interviewers and other safety concerns, issues that were discussed extensively with the data collectors before the fieldwork; therefore, it is unlikely that they were interviewed.

[8] A TB treatment supporter is most often a member of the TB patient's family or a work colleague who has been trained to observe that the patient is swallowing the right drugs, in the right doses, at the right intervals.

treatment even though the national TB guidelines recommend that treatment is supervised by a health worker, HEW, or trained treatment supporter (FMOH, 2017a). Nearly all facilities reported providing HIV counseling and testing services (Figure 6).

Figure 6. TB screening and diagnosis services

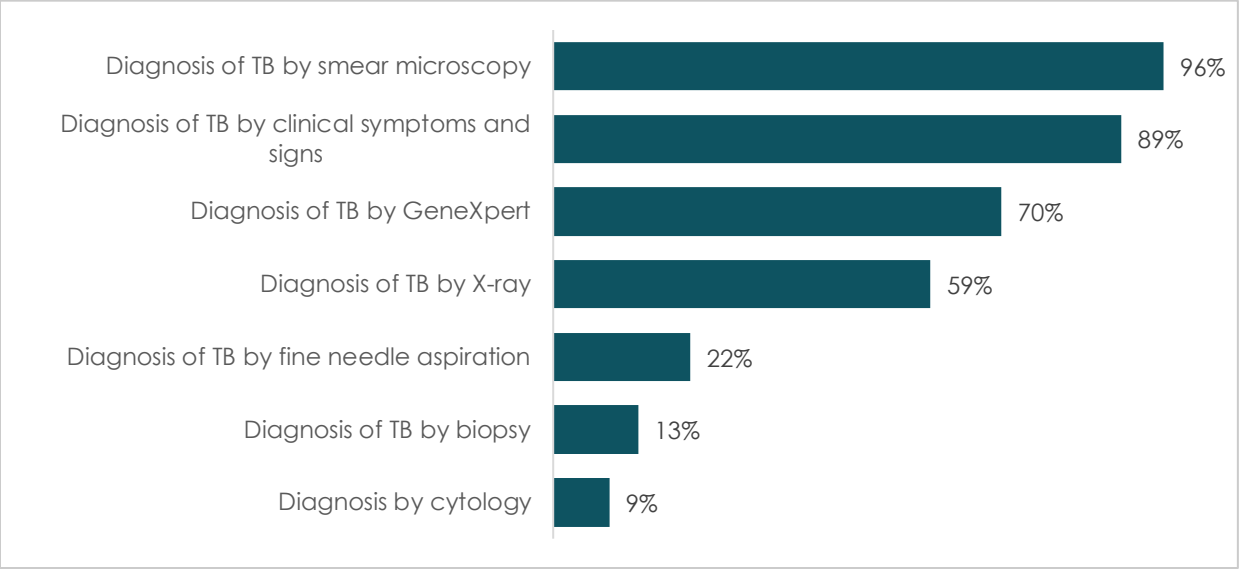


TB Screening and Diagnosis

The facilities were asked about the methods that they used to diagnose TB, inclusive of tests done both onsite and samples referred to an offsite laboratory for testing (Figure 7). The majority of the facilities reported diagnosis of TB by smear microscopy (96%), followed by clinical signs and symptoms (89%), and GeneXpert (70%). More than one-half (59%) indicated that they used x-ray.[9] A small proportion of the facilities used fine needle aspiration (22%), biopsy (13%), or cytology (9%) for TB diagnosis, most of which were higher-level urban facilities. Diagnosis with GeneXpert and x-ray was reported most often by the urban facilities, especially by the public and private hospitals (Table C2.2). A further breakdown of the availability of lab services, by whether the service was offered onsite or offsite, is presented in the Laboratory Infrastructure section below and in Table C2.3.

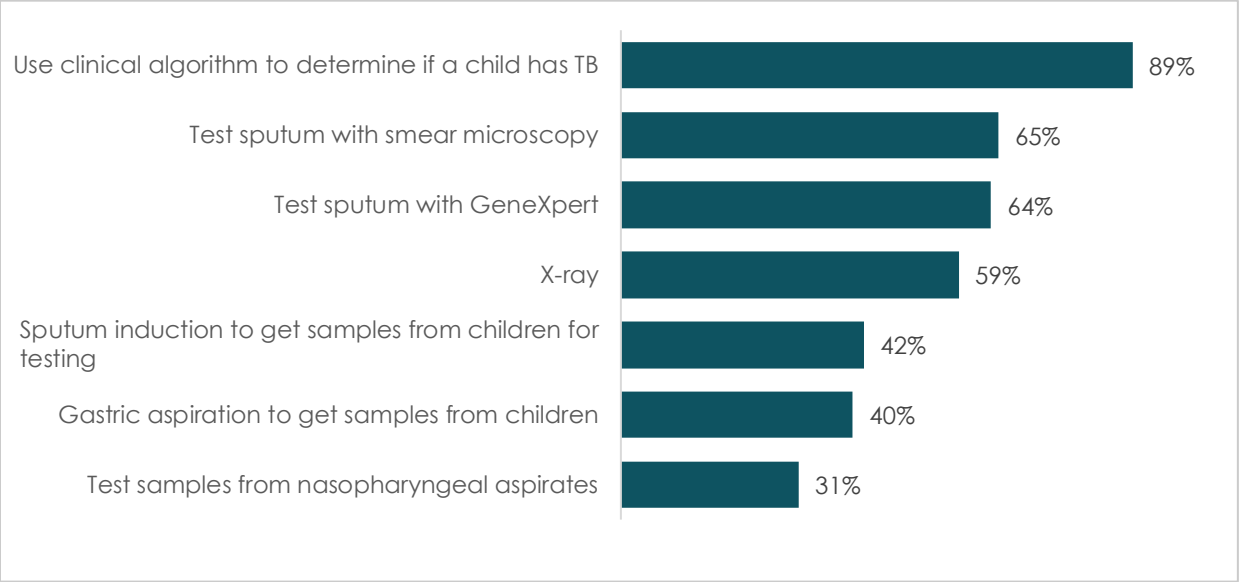
[9] X-ray is not included in the diagnosis algorithm in the FMOH's National Guidelines for TB, DR-TB and Leprosy (2017a). It is used at the discretion of the clinician for selected patients.

Figure 7. Type of diagnosis method used (whether through onsite or offsite laboratory) (n=181)



Facilities that reported offering pediatric TB diagnosis services were asked about the availability of different diagnosis procedures at their facilities through questions that first required them to give a spontaneous unprompted response, followed by a prompted response if they were unable to respond on their own. The percentage of the facilities that gave responses spontaneously was consistently lower than those that responded after being prompted. Figure 8 shows the percentage of the facilities that reported having different pediatric diagnosis procedures available after being prompted with those services. Eighty-nine percent of the facilities reported using clinical algorithms to determine whether a child had TB when prompted (Figure 8) compared with 62 percent of the facilities that spontaneously gave the response (data not shown). Likewise, 42 percent of the facilities reported using sputum induction to get samples from children after being prompted, compared with 15 percent of the facilities that spontaneously gave the response (data not shown). The facilities reported roughly equal rates of testing children by smear microscopy (40% unprompted, 65% prompted) and GeneXpert (36% unprompted, 64% prompted).

Figure 8. Availability of pediatric diagnosis services (n=159)



TB Treatment and Care

Of the 185 facilities sampled, 96 percent reported initiating and managing the treatment of DS-TB patients, 1 percent reported initiating treatment only, 2 percent reported managing treatment only, and 1 percent reported providing no DS-TB services (Table C2.4).

Almost one-third of the facilities sampled (n=58) also treated DR-TB patients. Of these facilities, 12 were TICs (found exclusively at urban public hospitals), and all 58 served as treatment follow-up centers (TFCs). All but nine of the 58 DR-TB facilities were in an urban setting. The nine facilities located in a rural setting were all TFCs (Table C2.4).

All 12 TICs reported having the new short (9- to 12-month) standardized treatment regimen (4–6 Am-Mfx-Pto-Cfz-Z-HH-E/5 Mfx-Cfz-Z-E); 11 had the short standardized regimen (4-6 Km-Mfx-Pto-Cfz-Z-HH-E/5 Mfx-Cfz-Z-E) and the longer standardized regimen (20 Bdq-Mfx-Lzd-Cfz); and nine had the longer (20-month) individualized regimen (20 Bdq-Mfx-Lzd-Cfz-Cs- Dlm-Pto-Z) available. Eight of the 12 TICs reported the new short standardized regimen (4-6 Am-Mfx-Pto-Cfz-Z-HH-E/5 Mfx-Cfz-Z-E) as their most used regimen for the treatment of RR-/MDR-TB (Table C2.5).

Almost three-fourths of the facilities (73%) reported initiating and managing DS-TB treatment in children (data not shown). Only six TICs initiated DR-TB treatment for pediatric patients. Of the facilities that reported providing treatment services to children, 94 percent reported using fixed-dose combinations (FDCs) (Table C2.6). More than four-fifths (81%) of the 151 facilities that reported using FDCs had them available (i.e., observed by data collectors) in dispersible form (data not shown).

HIV Linkages

As previously mentioned, all but one of the facilities sampled provided HIV-related services (Figure 6). Of these, almost all reported providing HIV testing and counseling to confirmed TB patients (98%) and presumptive TB patients (94%) (Figure 9 and Table C2.7). Of the facilities that offered HIV care and treatment services, 85 percent provided TPT to PLHIV. Of the facilities that offered any HIV service, 46

percent reported that they provided TPT to children between the ages of 5 and 15 years, and 71 percent reported that they provided TPT to children under the age of 5 years (Figure 10 and Table C2.7).

Figure 9. Availability of HIV services

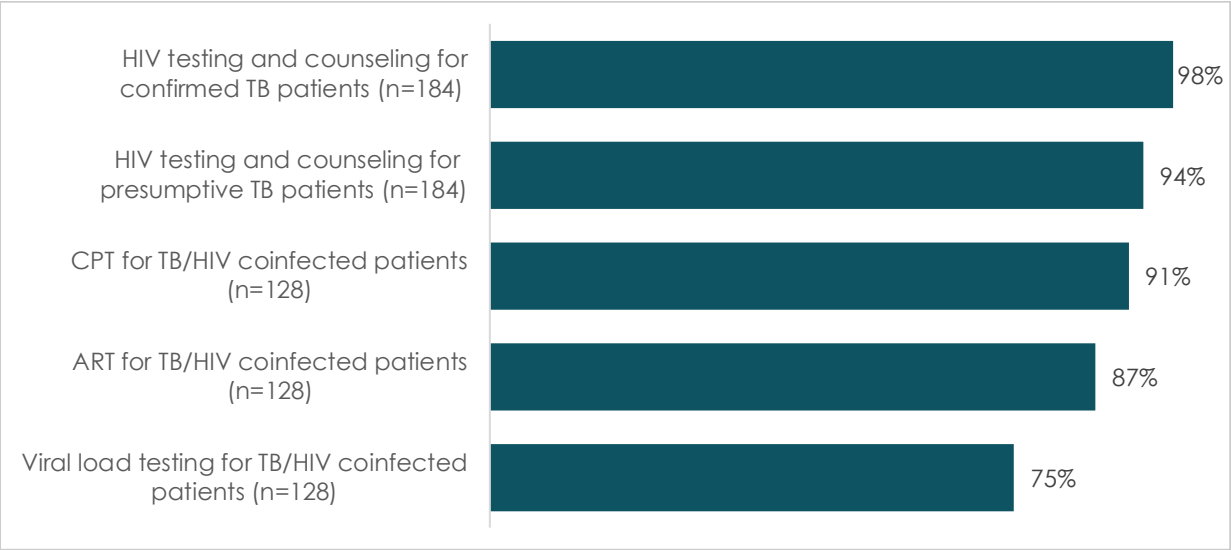
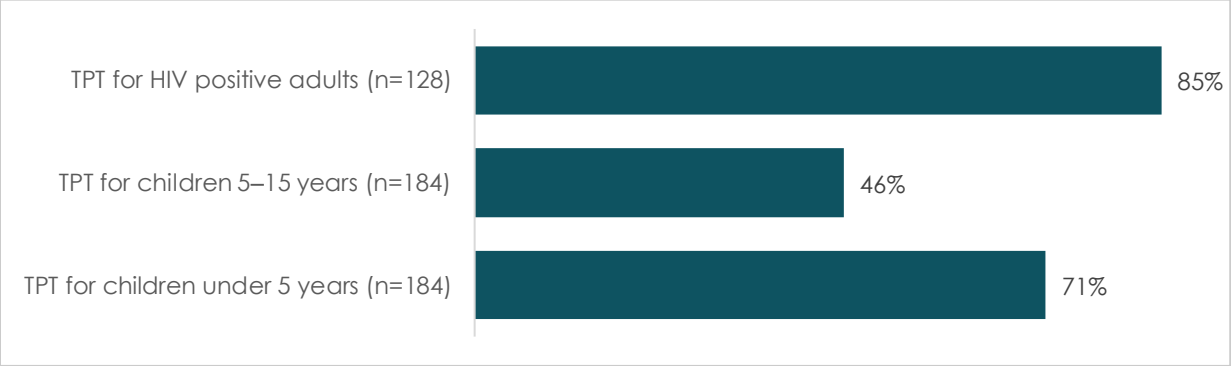


Figure 10. Availability of TPT services



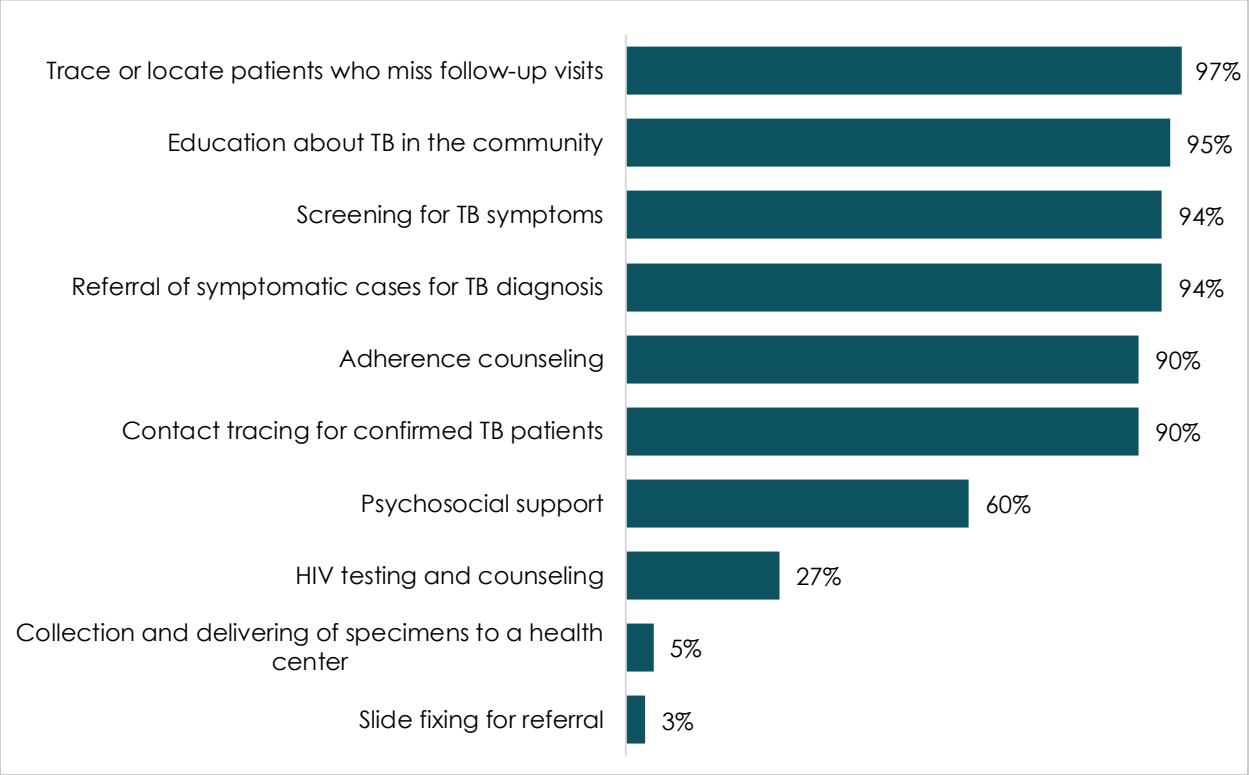
Of the 128 facilities that reported providing HIV care and treatment services to TB/HIV coinfected patients, 91 percent provided cotrimoxazole preventive therapy (CPT), 87 percent provided ART, and 75 percent provided viral load testing (Figure 9 and Table C2.8). The analysis of services by location showed that urban facilities were more likely than rural facilities to offer certain HIV services, such as CPT (97% versus 64%), ART (94% versus 50%), and viral load testing (82% versus 41%), which is not surprising given the fact that HIV/AIDS tends to be concentrated in the major urban areas in Ethiopia.

Community Linkages

HEWs were included in the provider sample, and questions about HEWs and the types of services that they provided to TB patients were included in the facility audit.

More than three-quarters of the facilities (78%) reported working with HEWs to provide additional services or support to TB patients (data not shown). As Figure 11 shows, the majority of the facilities that worked with HEWs reported that the HEWs provided services for patient tracing, community TB education, screening for TB, referrals to facilities, adherence counseling, and contact tracing. No major differences were observed between urban and rural facilities in terms of the types of services that they reported were provided by HEWs (Table C2.9).

Figure 11. General services provided by HEWs, as reported by health centers (n=145)



Nearly three-quarters of the facilities that worked with HEWs reported that TB staff from the facility conducted community-level supervision of the HEWs, met regularly with them, and kept a record of their performance (Table 4).

Table 4. Management of the HEWs (n=145)

	Facility Type						Facility Location				Total (n=145)	
	Public Hospital* (n=8)		Health Center (n=136)		Other (n=1)		Urban (n=90)		Rural (n=55)			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
HEWs received training in TB screening, diagnosis, or treatment in the past 24 months	1	12.5	54	39.7	0	0.0	33	36.7	22	40.0	55	37.9
Facility keeps a record of the performance of the HEWs	1	12.5	103	75.7	0	0.0	64	71.1	40	72.7	104	71.7
TB focal person meets regularly (monthly or quarterly) with the HEWs	2	25.0	101	74.3	1	100.0	64	71.1	40	72.7	104	71.7
TB staff from this facility conduct community-level supervision of the HEWs	1	12.5	104	76.5	0	0.0	62	68.9	43	78.2	105	72.4

***** Hospitals typically do not manage HEWs; however, in this part of the assessment, a few hospitals that manage health centers that work with HEWs responded to these questions.

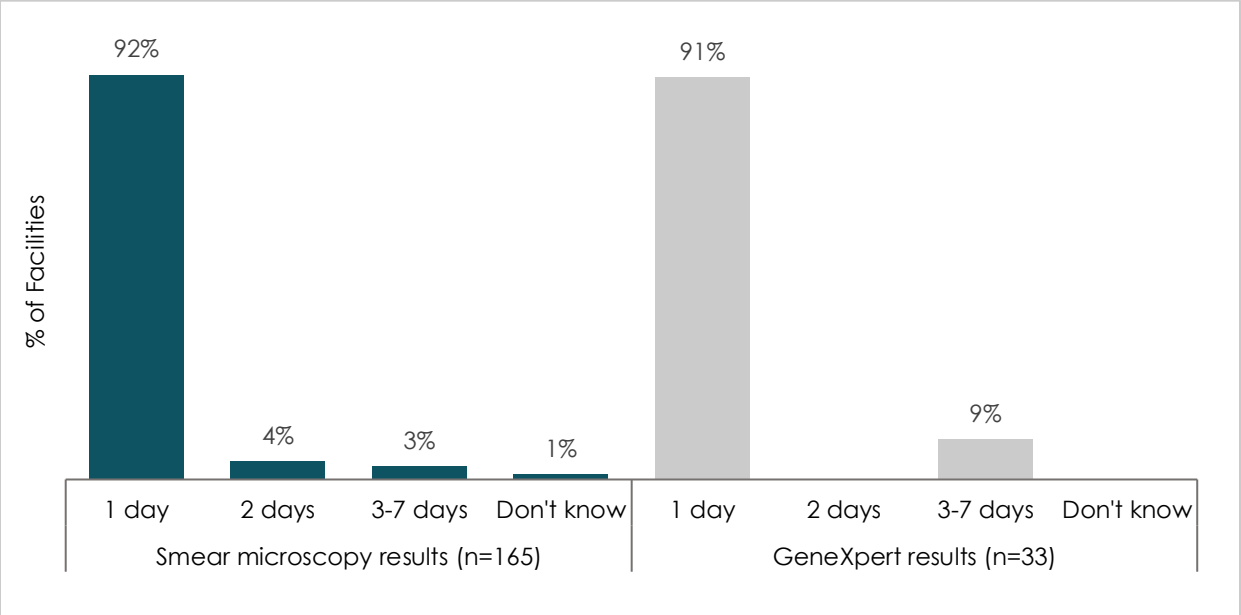
Laboratory Infrastructure

Adequate laboratory infrastructure is critical for facilities to provide necessary and timely services and to follow required protocols for TB diagnosis and treatment.

Laboratory Turnaround Time

The turnaround time for receiving specimen results varied depending on the type of test done and whether the laboratory was located onsite at the facility or offsite at a different facility. Nearly 90 percent (89%) of the facilities had an onsite laboratory capable of conducting smear microscopy (n=165) (Figure 12). Of these facilities, 92 percent reported receiving test results in one day or less. Almost 18 percent of the facilities sampled had onsite GeneXpert (n=33). Of these, 91 percent reported receiving test results in one day or less.

Figure 12. Average turnaround time for facilities that use onsite laboratories

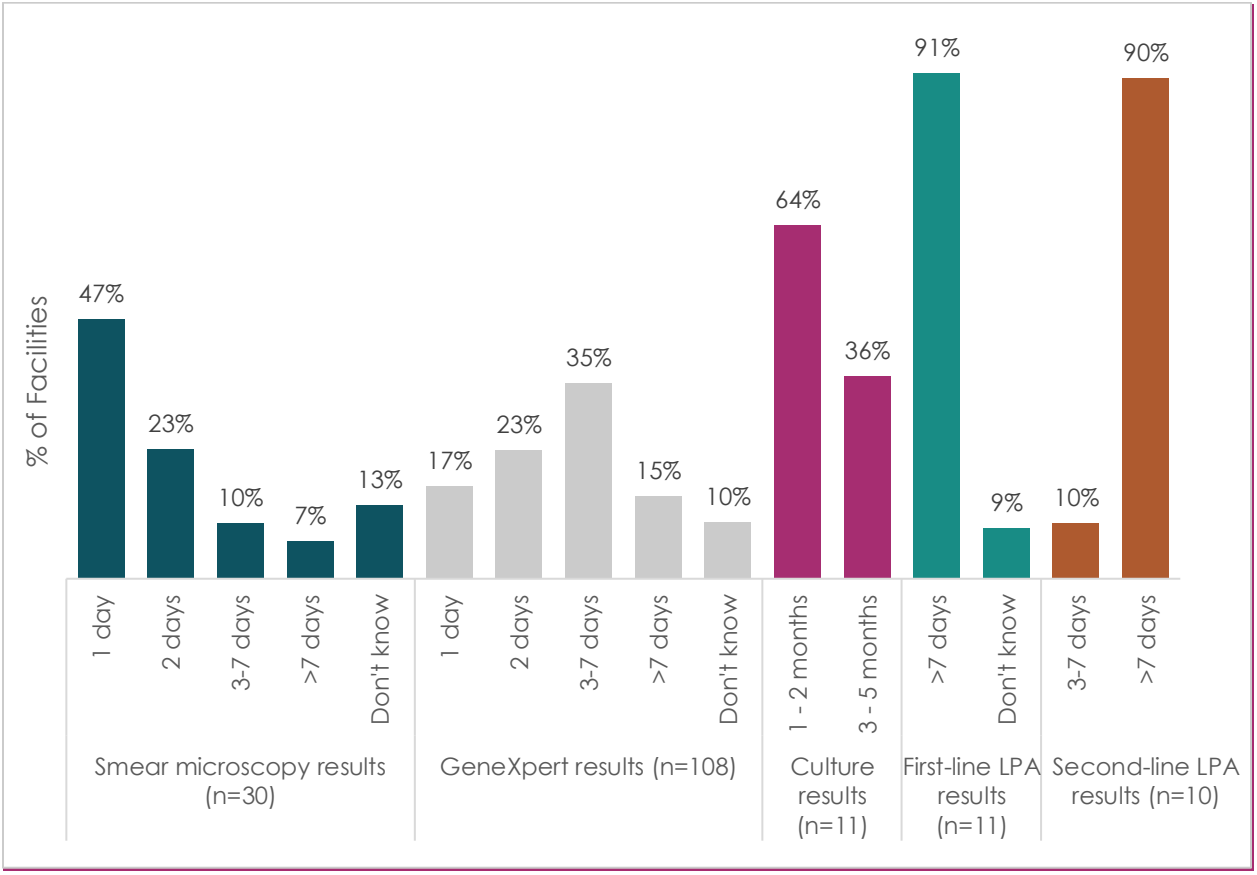


Fewer than one-fifth of the facilities sampled (16%) reported using an offsite laboratory for smear microscopy (n=30) (Table C2.11). Of these facilities, nearly one-half (47%) reported receiving test results in one day or less, nearly one-quarter (23%) reported receiving results in two days, and 10 percent reported receiving results in three to seven days (Figure 13 and Table C2.11).

Almost three-quarters (74%) of the facilities that reported providing diagnosis and testing using GeneXpert used an offsite laboratory for this service (n=108) (Table C2.11). Thirty-five percent of these facilities reported receiving test results within three to seven days, and one-half of the facilities (50%) reported receiving results after more than two days (Figure 13 and Table C2.11).

In total, only 48 facilities reported an average turnaround time of one day or less for GeneXpert results (30 reporting an onsite laboratory and 18 reporting an offsite laboratory) (Tables C2.10 and C2.11, respectively).

Figure 13. Average turnaround time for facilities that use offsite laboratories



Drug Susceptibility Testing

Fewer than one-half (43%) of the facilities with onsite laboratories reported conducting first-line DST onsite in the past 12 months. All these facilities reported using GeneXpert, whereas there was one report each for first-line probe assays, solid culture, and liquid culture (Table C2.12). Only one urban DR-TB TIC reported having onsite second-line DST methods, including probe assays (e.g., MTBDRsl), solid culture, and liquid culture (data not shown). This service is primarily provided by national and regional laboratories, which were not included in this assessment.

Availability of General Laboratory Supplies

The majority of the facilities (85%) had laboratory request forms and more than three-quarters (78%) had standard operating procedures for specimen collection available on the day of the survey. However, more than one-third of the facilities (35%) reported having a stockout of specimen management supplies, such as sealable, leak-proof sputum containers, in the past six months. Respondents at each facility were asked to describe their sputum collection procedure. Almost all facilities (93%) did this correctly (Table C2.13).

Availability of Laboratory Reagents and Equipment

The facilities that reported having onsite laboratory capacity for smear microscopy (n=165) and onsite GeneXpert (n=33) were asked about the availability and functionality of supplies, reagents, and equipment, followed by an observation of whether the supplies were available on the day of the assessment. For facilities that used the Ziehl-Neelsen test for acid fast bacilli, 94 percent were found to have carbolfuscin stain, 85 percent had sulfuric acid or acid alcohol, and 95 percent had methyl blue stain available and observed by the data collection teams. Just under one-half (49%) of the facilities were equipped with a functional fluorescence microscope (FM), 76 percent of which had auramine stain for the FM available on the day of the assessment (Table C2.14).

Almost all (97%) of the facilities that reported having GeneXpert onsite were found to have at least one functional GeneXpert module available on the day of the assessment. However, only 88 percent of these facilities had at least one valid Xpert MTB/RIF cartridge available. Last, among the facilities with onsite laboratories, only 11 percent had a functional biosafety hood or cabinet (Table C2.14).

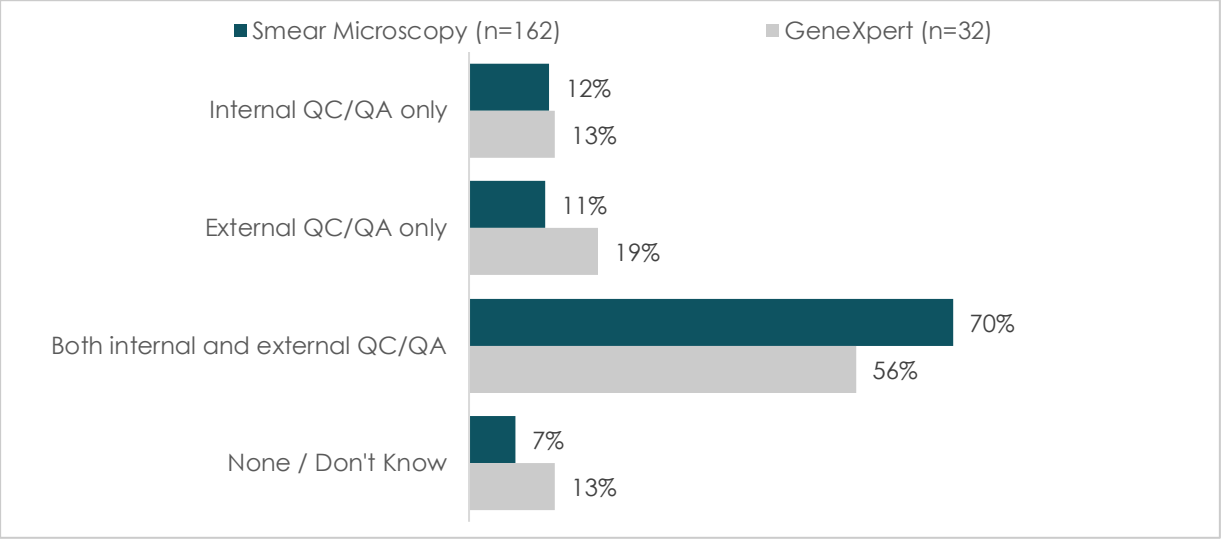
Laboratory Quality Assurance/Quality Control Procedures

Facilities with onsite diagnosis services were asked about quality assurance and quality control (QA/QC) procedures used in their laboratories (Figure 14). Almost three-quarters of the facilities (70 %) offering onsite smear microscopy, and more than one-half of the facilities (56%) offering onsite GeneXpert used both internal and external QA/QC procedures. It should be noted that 13 percent of the facilities offering onsite GeneXpert (n=4) reported that no QA/QC practice was followed at the facility.

Almost 90 percent (89%) of the facilities that reported using some type of QA/QC procedures for smear microscopy reported maintaining QA/QC results, and 87 percent of them reported having QA/QC guidelines (Table C2.15).

One facility that had the capability to do liquid cultures, solid cultures, and line probe assays (LPAs) reported using both internal and external QA/QC procedures, maintaining QA/QC results, and having guidelines for all three types of diagnosis tests (Table C2.15).

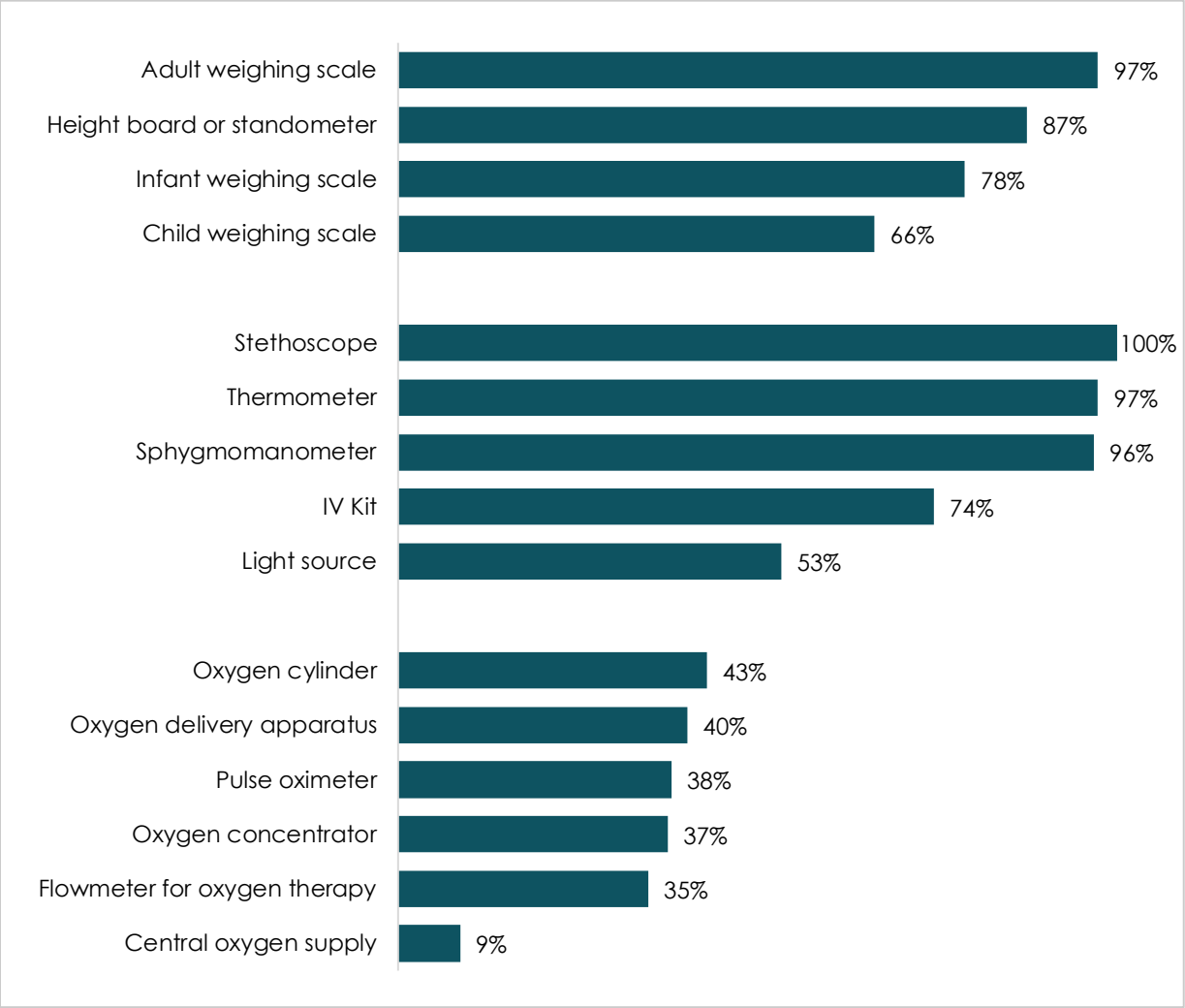
Figure 14. Type of quality control used by facilities for smear microscopy and GeneXpert



Medical Equipment and Drug Supplies

The facilities were assessed on the availability of equipment and TB-related medications on the day of the assessment (Figure 15 and Table C2.16). Most facilities (>75%) had at least one functional adult weighing scale, infant weighing scale, height board or standometer, sphygmomanometer, thermometer, and stethoscope available for use. More than one-half of the facilities (50% to 75%) had at least one functional child weighing scale, intravenous infusion kit, and light source. Forty-three percent of the facilities or fewer were found to have at least one oxygen concentrator, oxygen cylinder, central oxygen supply, oxygen delivery apparatus, flowmeter for oxygen therapy, and pulse oximeter available for use.

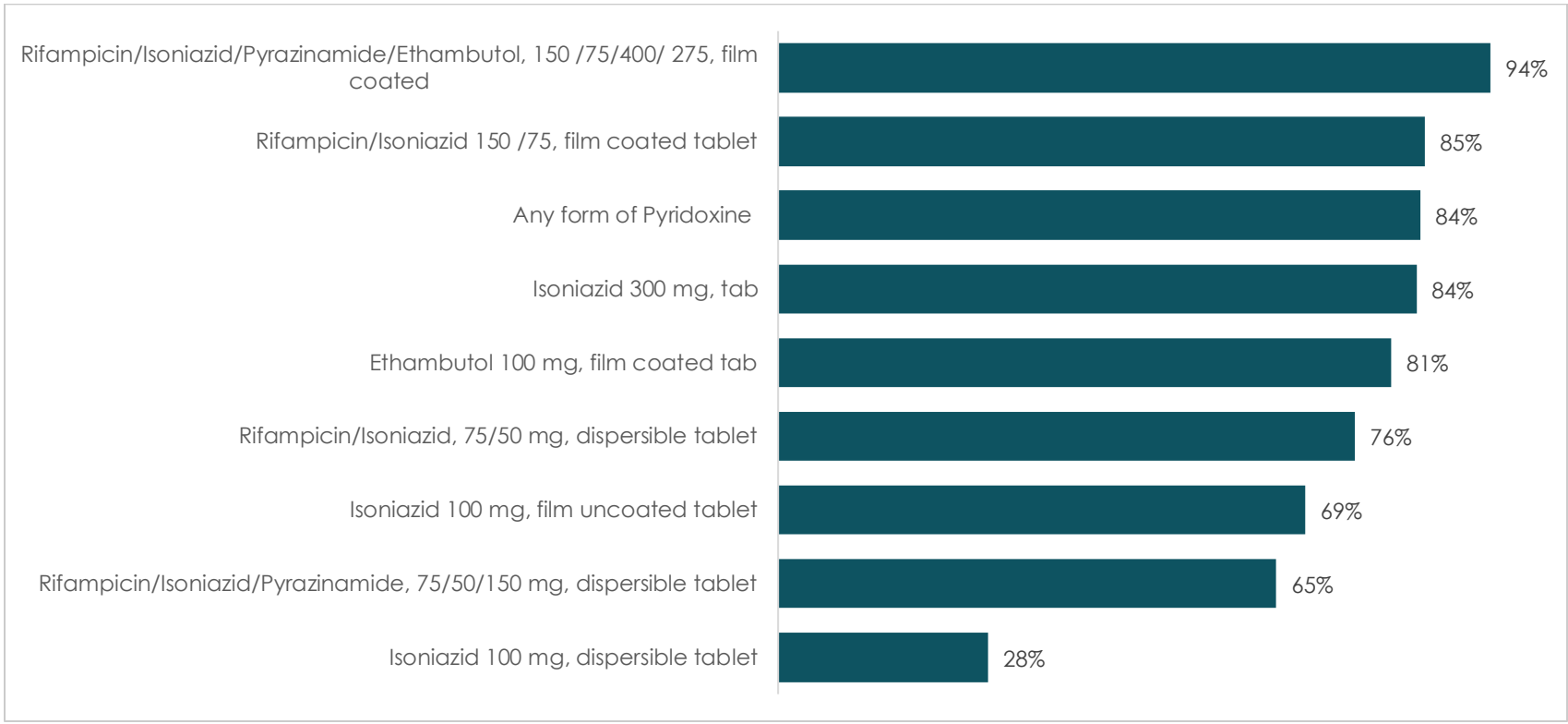
Figure 15. Functional basic medical equipment observed on the day of the assessment (N=185)



An uninterrupted drug supply and drug availability are essential for quality TB services. The survey assessed the availability and validity (i.e., that drugs were neither expired nor damaged) of first-line TB treatment drugs and drugs for TPT (isoniazid) at all study facilities, and the availability of second-line treatment drugs at DR-TB treatment initiation sites.

The first-line standard treatment regimen, consisting of the four-drug FDC (FDC-4) tablets (RHZE 150/75/400/275 mg) used during the intensive phase was found at 94 percent of the facilities assessed, and the two-drug FDC (FDC-2) (RH 150/75 mg) used during the continuation phase was found at 85 percent of the facilities (Figure 16 and Table C2.17). Although almost 100 percent of the health centers reported dispensing drugs for TB treatment, only 133 facilities, or 92 percent, had the standard treatment regimen available on the day of the assessment (Table C2.17). At facilities that provided pediatric TB treatment, the first-line pediatric FDC RHZ 75/50/150 mg (intensive phase) was found at 65 percent of the facilities and RH 75/50 mg (continuation phase) at 76 percent of the facilities (Figure 16 and Table C2.17).

Figure 16. Availability of first-line TB treatment drugs at treatment facilities on the day of the assessment (N=185)



Treatment with the standardized shorter treatment regimen (STR) described in the NTLP guidelines is the preferred choice to treat the majority of RR-/MDR-TB patients who have no additional risk or laboratory evidence of resistance or intolerance to medicines used in the regimen (FMOH, 2017a). All 12 TICs had the following STR drugs available: clofazimine 100 mg, moxifloxacin 400 mg, protionamide 250 mg, and pyrazinamide 400 mg. However, only 11 of the 12 facilities had ethambutol 400 mg and only 10 facilities had amikacin 500 mg/2 ml on the day of the assessment. Of the remaining second-line drugs, cycloserine 250 mg and levofloxacin 250 mg were found at all TICs; bedaquiline 100 mg and capreomycin 1000 mg were found at 11 TICs; 10 or fewer facilities had the remaining drugs used for individualized regimens (Table C2.18).

Storage Conditions

Storage conditions for commodities and supplies at all study facilities were evaluated against NTLP guidelines. In general, commodities/supplies were stored appropriately and in a well-organized manner. Generally, hospitals (both public and private) had slightly better storage conditions than health centers (Table C2.19). More than 80 percent of the facilities had storage facilities where the commodities and supplies were stored away from direct sunlight, were properly lit, and were arranged to facilitate the separation of usable supplies from expired and damaged ones. Around three-quarters had storage rooms that were clean (78%), well ventilated (72%), and where supplies and commodities were stored without direct contact with the walls or the floor (72%).

There were some areas of concern. Slightly more than two-thirds of the facilities (68%) had storage facilities in which supplies and commodities were stored to prevent water damage, and only one-third had a functional thermometer in the storage room to regularly monitor the temperature (33%). Temperature monitoring was found to be especially low at rural facilities (16%) (Table C2.19).

Infection Prevention and Control

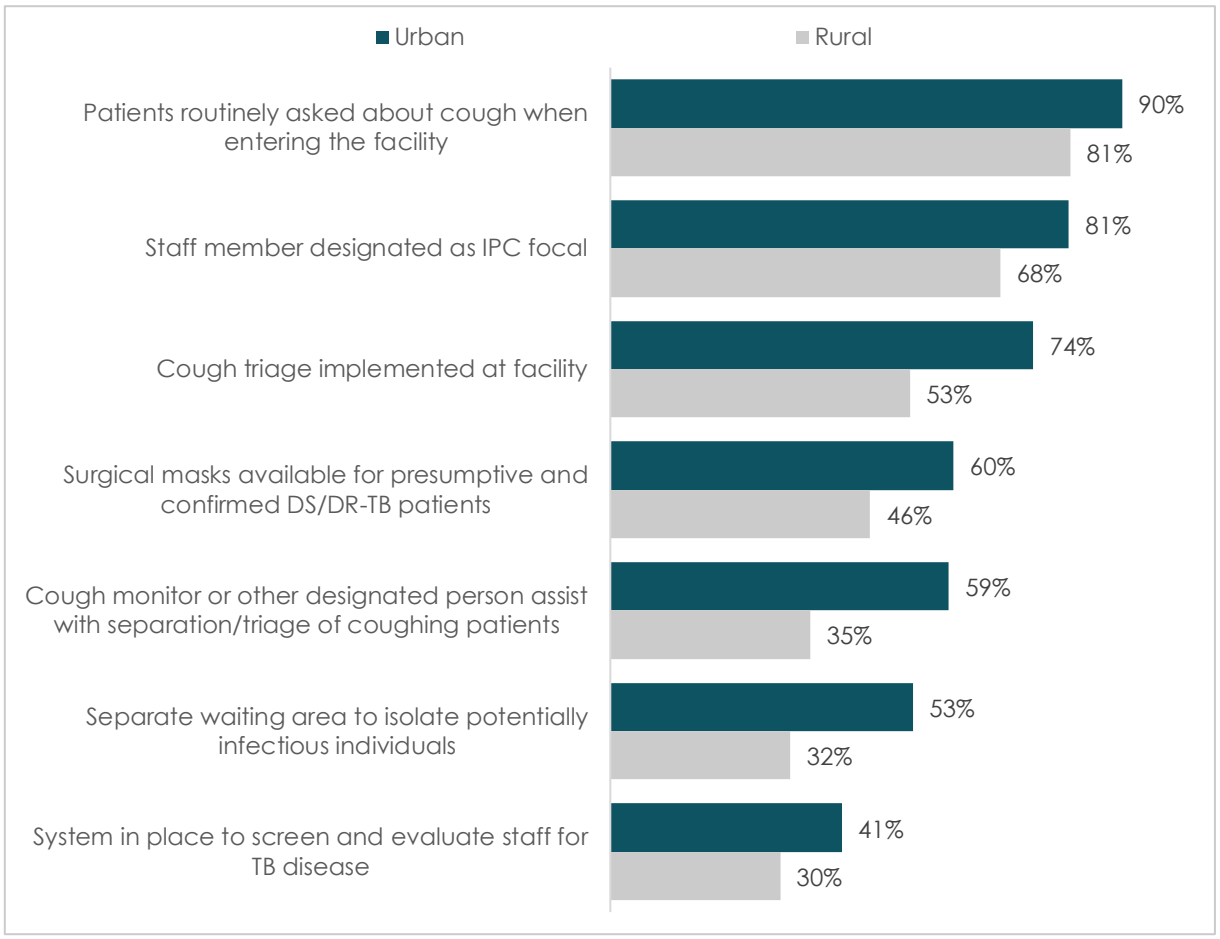
Infection Prevention and Control Practices

Healthcare settings present a high risk for the transmission of TB. It is therefore critical to follow infection prevention and control (IPC) procedures to limit the transmission of the airborne disease and infection. As part of the assessment, study facilities were asked about their IPC practices.

Overall, more urban facilities followed the standard IPC practices compared with rural facilities (Figure 17), and more hospitals (both public and private) followed the standard IPC practices compared with health centers (Table C2.20). More than three-quarters of the facilities asked patients about coughing during triage (87%) (Table C2.20) and had waiting areas that were either outdoors or indoors with access to continuous fresh air (75%) (Table C2.21). However, only between one-half and three-quarters of the facilities had a staff member designated as an IPC focal person (77%), implemented a cough triage system (68%), had surgical masks available for presumptive and confirmed DS-/DR-TB patients (56%), and had a cough monitor or person designated to assist with triage of coughing patients (52%)(Table C2.20). Figure 17 shows the IPC practices by urban and rural results.

Of greatest concern were the findings that fewer than one-half of the facilities had supplies, such as tissues for coughing patients (48%) (Table C2.21); had a separate waiting area to isolate potentially infectious people (47%) (Table C2.20); had an updated and approved infection prevention and control plan (47%) (Table C2.21); had an updated annual TB IPC risk assessment result (38%) (Table C2.21); and had a system in place to screen and evaluate staff for TB disease (37%) (Table C2.20). Of the facilities that had a staff screening system in place, only 10 percent maintained a confidential log for all staff with presumptive or confirmed TB (Table C2.21).

Figure 17. Infection prevention and control practices reported by the facility (N=185)



The following IPC supplies/equipment were observed at 80 percent or more of the study facilities: sharps container, disposable latex gloves, disinfectant, gowns, a waste receptacle, and single use disposable syringes with needles. Running water was available at 82 percent of the facilities. The following IPC supplies were found at one-half to three-quarters of the facilities: hand washing soap, medical waste receptacle with lid and plastic bin liners, needles destroyer, and methylated spirit and glycerin. Eye protection/goggles or face protection were found at fewer than one-half of the facilities (44%) (Table C2.22).

As for other IPC practices implemented during sputum specimen collection, three-quarters of the facilities collected specimens in a well-ventilated area (75%), but only two-thirds collected specimens someplace other

than the screening and treatment area (69%), and away from other patients (65%). Fewer than one-half of the facilities had a separate room for specimen collection (48%) (Table C2.23).

N-95 respirators were observed and available for use by health facility staff at 69 of the 79 facilities that reported having them, including 11 of the 12 DR-TB TICs. Among the facilities that reported having the respirators, 68 percent said that their staff had been trained on the proper fit of the respirators but fewer than one-third reported that providers used the respirators all the time, and 5 percent reported that they were never used (Table C2.24).

In addition to evaluating the facilities on the availability of IPC-related materials, the providers were assessed on their IPC knowledge and practices using targeted questions. Most providers (90% or more) knew that doors and windows should be left open when a presumed/confirmed TB patient was in the room; that presumed/confirmed TB patients should be separated from other patients at the facility; and that healthcare providers should minimize the time that the TB patients spent at the health facility. Approximately three-quarters of the providers knew that fans (ventilators) should be used in TB wards to reduce the transmission of TB (75%) and that surgical masks protect them from the TB bacteria (80%) (Table C2.25).

Most providers (90% or more) indicated that they gave priority to coughing patients, (i.e., attended to patients who were coughing first); requested TB diagnosis testing if the patient was symptomatic; kept all windows open; educated the TB patients on cough etiquette; screened all family members of confirmed TB patients for TB symptoms; and discussed with family members basic information and skills to protect household members and contacts from infection. Fewer than three-quarters of the providers said that they used a mask/respirator when treating presumptive or confirmed TB patients (74%) and turned on fans to exhaust air outside the room or blow air in the direction away from others when treating presumptive or confirmed TB cases (66%) (Table C2.25).

TB Screening of Staff

Only 37 percent of the facilities reported having a system in place, whether formal or informal, to screen and evaluate facility staff for TB. Slightly more than one-half of the public hospitals had such a system. Of the 69 facilities that reported having a staff screening system in place, 19 (28%) had at least one staff member who had been diagnosed with active TB in the past year (Table C2.26).

Capacity of TB Providers

Training

The assessment investigated the providers' capacity to deliver quality TB care in two ways. First, in the facility audit, the TB focal persons at the facilities were asked about TB-related training (both new and refresher) that providers had received in the past two years (Table C2.27). Second, through the individual provider interviews, providers were asked whether they had received the training in the past two years. Although TB training is offered to facility staff in Ethiopia as a comprehensive TB package, to assess their capacity in different TB care service areas, the study asked respondents whether they had been trained in specific content areas.

In the facility audit, the TB focal persons responding on behalf of the facilities typically reported a larger number of providers having received training across all content areas (Table C2.28) compared with what the individual providers reported for themselves (Table C2.27). Forty percent or fewer of the providers reported

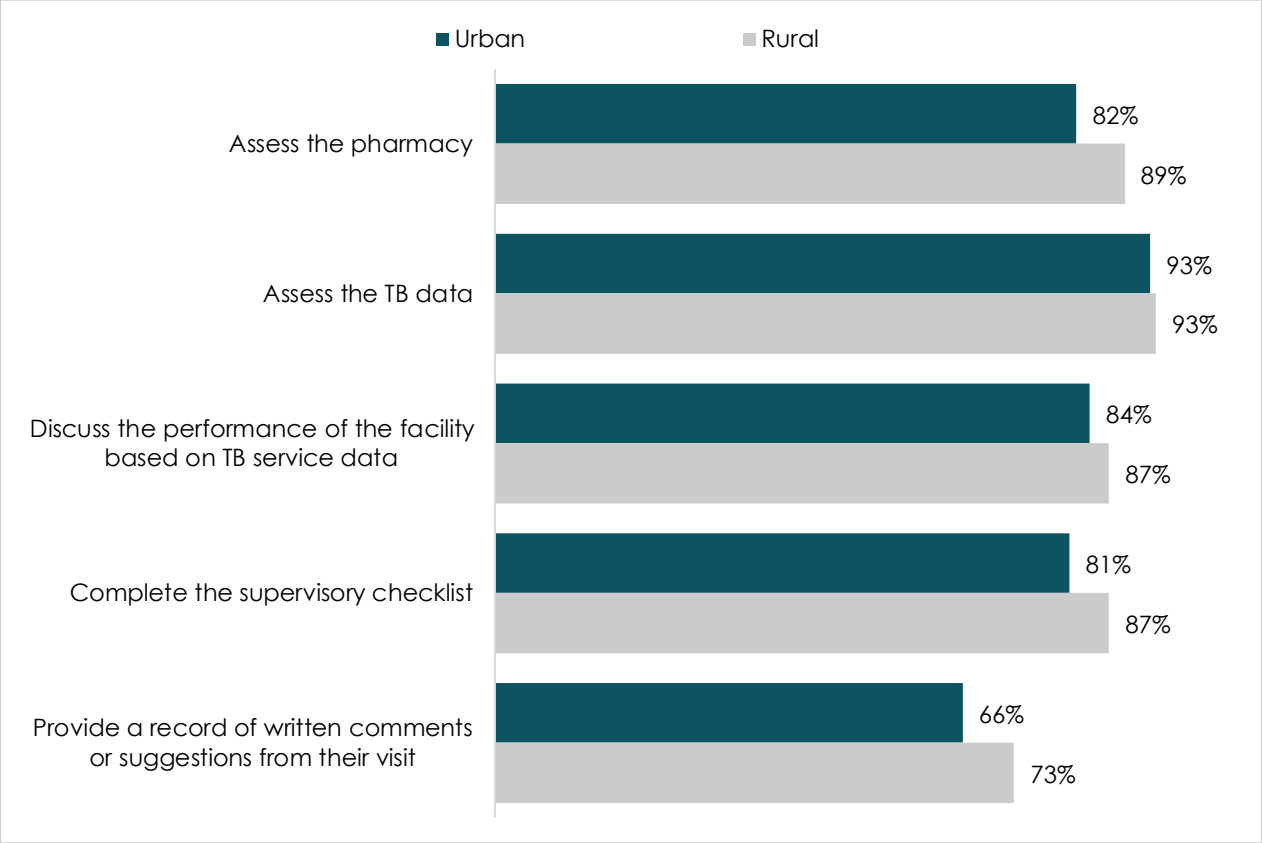
having received training across any one of the content areas in the past 24 months; in other words, 60 percent of the providers may have never received the training or may have received it more than two years ago (Table C2.27).

Supervision of the Providers

When TB care providers were asked about TB-specific supervisory visits that their facility had received in the past year, 52 percent of the health centers reported receiving a supervisory visit from the woreda health office.[10] Only 28 percent of the public hospitals (and no private hospitals) said that they had received a TB-specific supervisory visit from the Regional Health Bureau in the past year (Table C2.29).

For more than 80 percent of the supervision visits, the main activities conducted were the assessment of pharmacy/drug inventory and the assessment of data (e.g., completeness, quality, and/or timely reporting) in both urban and rural areas (Figure 18 and Table C2.30). A little more than 80 percent of the providers reported that supervisors discussed the facility's performance and accomplishments based on the TB service data or included completion of a supervision checklist during the visit.

Figure 18. Activities undertaken during the last supervisory visit, by facility location (n=151)



[10] Equivalent to a district health office and the health system level responsible for the supervision of public health facilities in their catchment area.

Management of TB Services

Policies, protocols, and guidelines on TB were observed at the study facilities at different rates depending on the document that was being asked about. Flowcharts or algorithms on TB diagnosis, flowcharts or algorithms on TB screening, a smear microscopy manual or guidelines, and algorithms for GeneXpert were observed at between 80 percent and 90 percent of relevant facilities. However, the essential drug or medicines list and the National Guidelines for TB, DR-TB and Leprosy in Ethiopia (Sixth edition) were found at only 72 percent and 49 percent of the facilities, respectively (Table C2.31).

Process Indicators

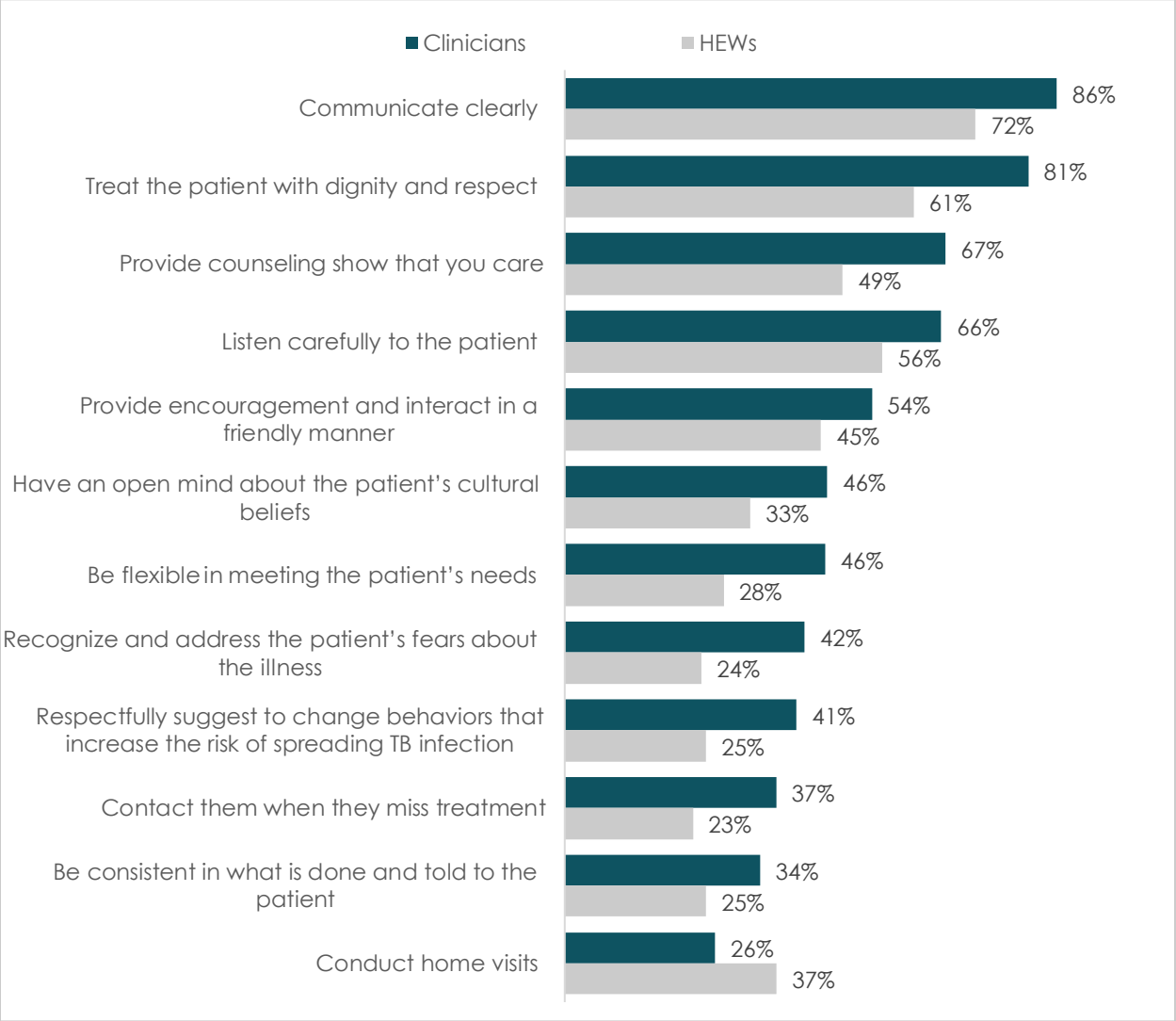
Process indicators capture the interaction between service providers and patients during caregiving. In combination with the structural factors associated with the health system, they influence the health outcomes of TB patients. In this section, we present the findings on the process of delivering TB care and treatment by measuring patient-provider interactions and communication, the level of TB knowledge and awareness among TB patients, barriers to TB care, stigma encountered by patients, affordability, and overall patient satisfaction with the services they received.

Providers' TB Case Management Practices

The providers were asked about the various types of patient management practices that they used as part of TB service delivery (Figure 19). First, they were asked what they did to establish a good rapport and build trust with their patients. Their spontaneous responses were recorded against a prepopulated list of potential response options. The majority of the clinicians and HEWs reported that they communicated "clearly" with their patients (86% and 72%, respectively) and treated them "with dignity and respect" (81% and 61%, respectively). More than 65 percent of the clinicians and about one-half of the HEWs reported that showing that they cared when providing counseling, and making sure to "listen carefully" to patients, were practices to establish patients' trust. Lower proportions of the clinicians and HEWs indicated that they encouraged patients, were "open-minded" about patients' cultural beliefs, identified patients' fears about TB, and suggested behavior changes to reduce the risk of spreading the disease. Still fewer (a little more than one-third of the clinicians and one-quarter of the HEWs) reported contacting patients after they had missed an appointment, and equal proportions of the clinicians and HEWs reported ensuring that they were consistent in what was done and told to the patient when managing their care.

The clinicians and HEWs were also asked what questions they asked their patients during the initial assessment (Table C3.1). More than three-quarters of all health workers reported that they asked their patients about their knowledge of TB. About one-half reported asking for personal information and discussed the patient's attitudes and/or beliefs about TB, and just under one-half asked their patients about their medical and psychosocial history. Only about one-third of the health workers reported discussing barriers to TB treatment and relevant resources during their initial assessment for care.

Figure 19. Percentage of providers who spontaneously reported using the following practices to build rapport and establish trust with their patients (N=409)



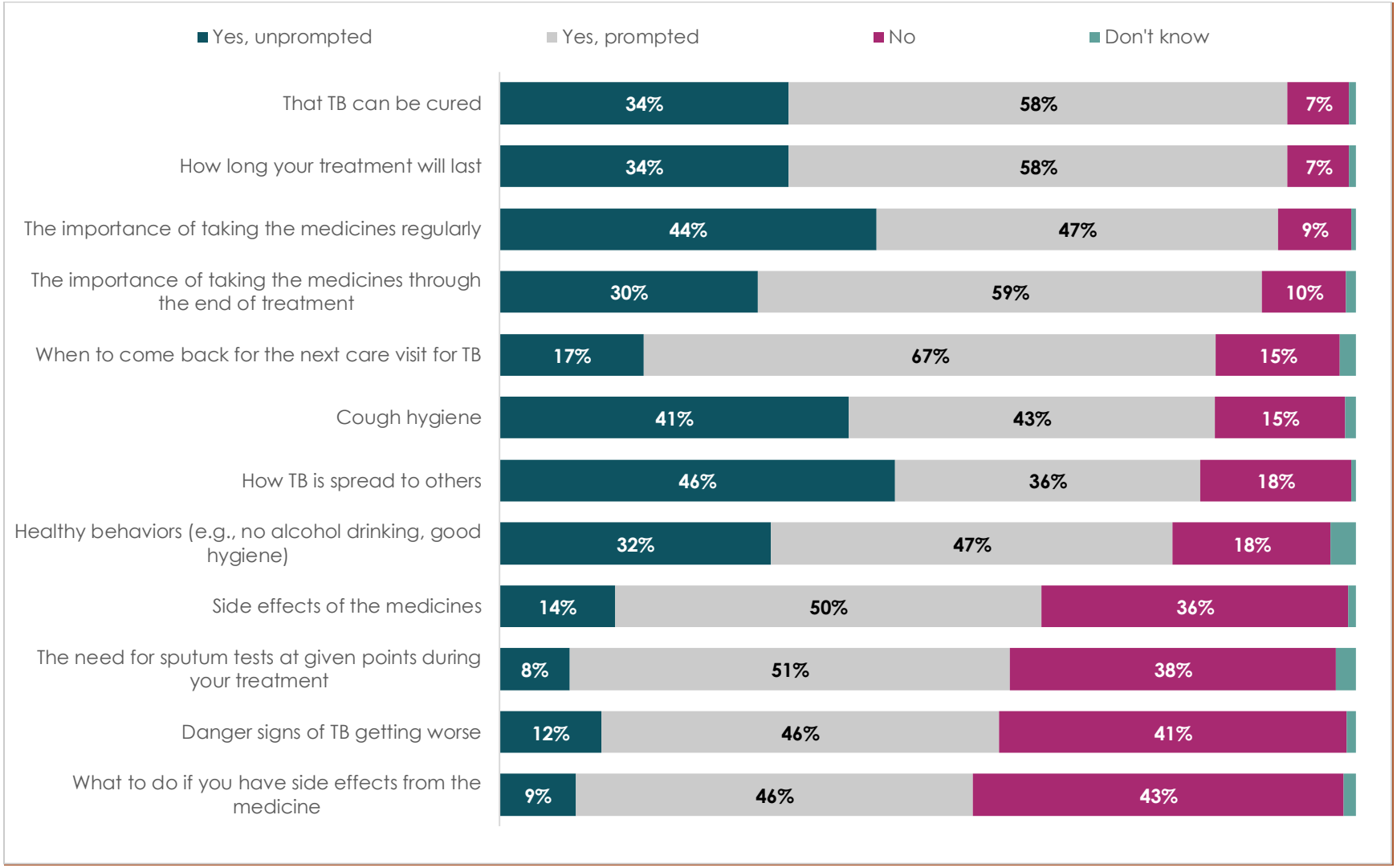
Health workers were asked about the information they discussed with their patients during counseling and how that information was communicated to their patients (verbally, in writing, or both) (Table C3.2). More than 90 percent reported providing information verbally on the meaning of TB test results; that TB can be cured; how long treatment will last; the number and frequency of medication doses; the importance of taking medications regularly and completing the full course of treatment; the treatment status of the patient and how they were progressing; possible side effects of their TB medications; what to do if side effects occurred; what to do if the patient ran out of medication or missed days of their treatment; options for treatment support and the need for a treatment supporter; and overall good practices to follow, including not smoking or drinking alcohol, maintaining good hygiene, and IPC. When discussing an overview of TB and how it is transmitted, a smaller proportion of the health workers (88% and 90%, respectively) indicated that they provided this information verbally to their patients, and only about 10 percent indicated that they provided this information both verbally and in written form.

Patient-Provider Interaction

In addition to gathering information about the provider-patient interaction during TB service delivery from the provider's perspective, the assessment collected information about these interactions from the patient's perspective.

The patients were asked about the kind of information that the healthcare providers shared with them, first unprompted without any answer options, and then prompted with potential responses (Figure 20 and Table C3.3). The most frequently mentioned topics (prompted and unprompted) were that TB can be cured (92%), how long their treatment will last (92%), the importance of taking the medicines regularly (91%), and the importance of taking the medications through the end of the TB treatment period (89%). Between one-half and two-thirds of the patients reported being told what to do if side effects occurred, what danger signs signaled a worsening TB infection, the need for sputum tests at set points during the treatment period (59%), and the side effects of TB medicines (64%).

Figure 20. Patients' reports on the type of information that providers gave (n=539)



The study also examined the amount of time that the patients generally spent at the health facility when they went for TB services. This included time spent at the OPD/triage, laboratory, and pharmacy, both in terms of waiting time and time spent with a clinician. On average, patients reported waiting 21 minutes to see the clinician(s) (19 minutes at urban facilities and 26 minutes at rural facilities). The patients at both urban and rural clinics spent 24 minutes with the clinician(s), resulting in an average of 45 minutes that the patients spent at the health facility when seeking TB services (data not shown).

The vast majority of the patients interviewed (92%) reported that they had a treatment supporter, most often a family member or a health worker (including HEWs) (Table 5). Those patients who had a treatment supporter indicated that they were observed by the supporter taking their medication 5.4 days per week, on average.

Table 5. Types of treatment supporters and average days per week that the TB patients were observed taking their medications (n=539)

	Total	
	No.	%
Health worker at this facility or in the community (HEW)	184	34.2
Family member/relative	301	56.0
Co-worker or other	12	2.2
None	41	7.6
On average, how many days per week does your treatment supporter watch you take your medicines?	5.4 days	

A small number of the patients indicated that they had ever stopped taking their TB medications for a month or more (n=9). Three patients stopped because their medication was not available at the health facility; one forgot to take it; and one reported not having time to get the medication from the health facility. Two patients had other reasons for stopping; one reported not having food to take with the medications (Table C3.5).

Patients' Knowledge about TB

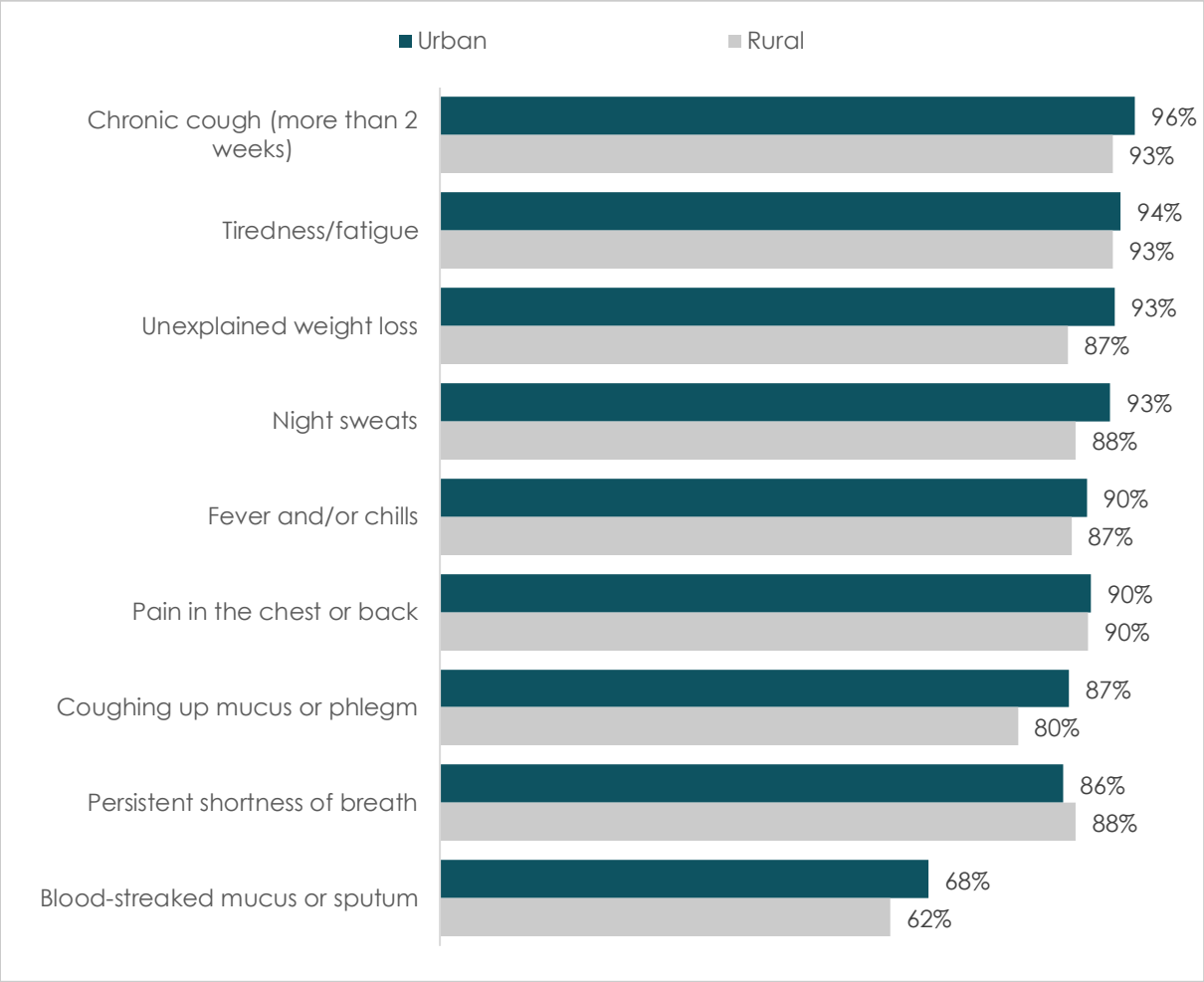
The patients were asked a variety of questions to gauge their knowledge and understanding of TB (e.g., TB symptoms, causes, and transmission). The responses were compared between the patients from urban and rural areas.

TB Symptoms

The patients were asked to list the symptoms of TB, first unprompted and then prompted with potential symptoms that were not initially mentioned. Knowledge of TB symptoms was high overall, and no major differences were seen between the knowledge of the patients from rural and urban areas (Figure 21 and Table C3.6). More than 90 percent of the patients indicated that a cough lasting more than two weeks, general tiredness/fatigue, unexplained or unintended weight loss, and night sweats were all symptoms of TB. A slightly lower proportion mentioned symptoms like fever, coughing up phlegm, and chronic shortness of

breath. Only 68 percent and 62 percent of the patients in urban and rural areas, respectively, stated that having blood-streaked mucus was a symptom of TB disease.

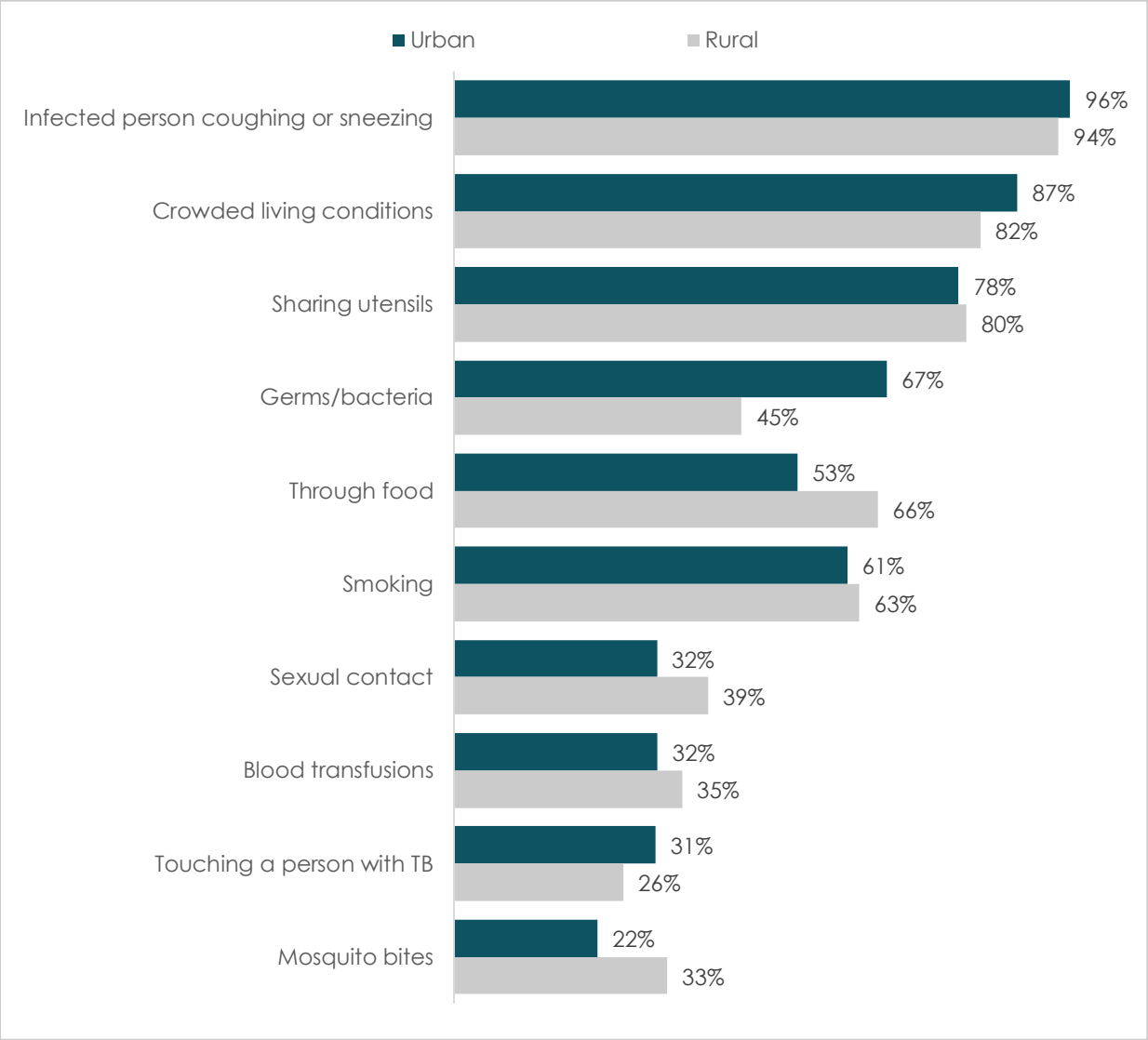
Figure 21. Patients' knowledge of TB symptoms (n=539)



Cause, Modes of Transmission, and Risks Factors

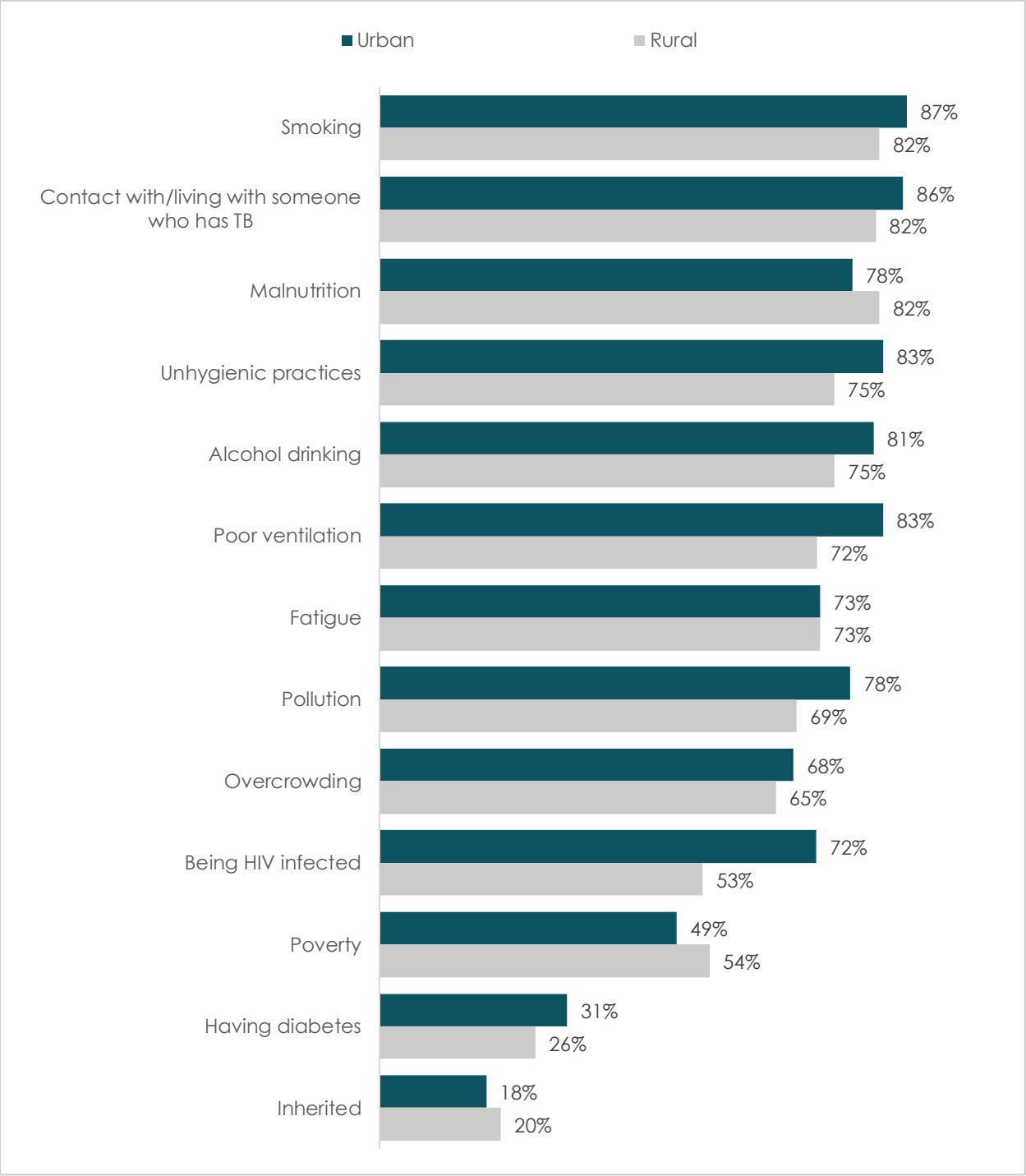
In some cases, differences in knowledge about the causes and modes of transmission of TB were observed between the patients from urban areas compared with those from rural areas (Figure 22). About 95 percent of all patients reported that TB can be transmitted through the coughs or sneezes of an infected individual, and about 79 percent of all patients thought that TB could be transmitted by sharing utensils with TB-infected people. More than two-thirds of the patients from urban areas, but just under one-half of the patients from rural areas, believed that TB was transmitted via germs/bacteria. About one-third of the patients mentioned sexual contact, blood transfusions, and touching a person with TB as causes/modes of transmission. Interestingly, about one-quarter of the patients from urban areas and one-third of the patients from rural areas thought that TB could be transmitted by mosquitos.

Figure 22. Patients' knowledge of the cause/modes of TB transmission (n=539)



When discussing risk factors for TB, the patients from rural and urban areas gave similar responses (Figure 23 and Table C3.8). More than three-quarters of the patients interviewed believed that smoking, contact with or living with someone who had TB, malnutrition, unhygienic practices, drinking alcohol, and poor ventilation were all risk factors associated with contracting TB. A lower proportion mentioned fatigue, pollution, overcrowding, HIV infection, and poverty; 19 percent of the patients thought that TB was an inherited disease.

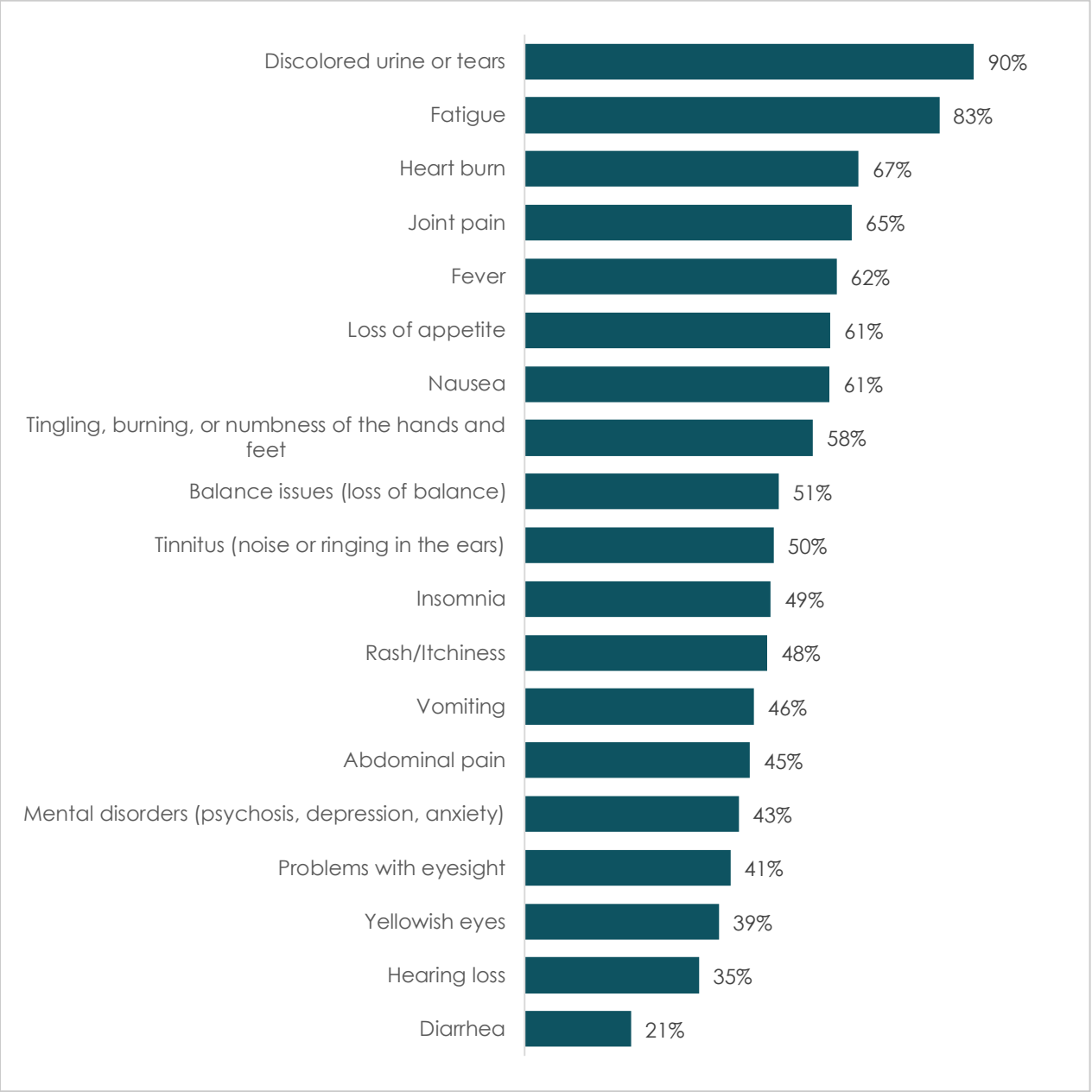
Figure 23. Patients' knowledge of TB risk factors (n=539)



TB Drug Side Effects

The patients were asked about their knowledge of the side effects associated with TB medications. The most common effects mentioned were discoloration of urine or tears and fatigue (Figure 24 and Table C3.9). More than one-half of the interviewees mentioned heartburn, joint pain, and nausea. One-half or fewer mentioned tingling of the hands and feet, itching, and eyesight problems.

Figure 24. Patients' knowledge of TB drug side effects (n=539)

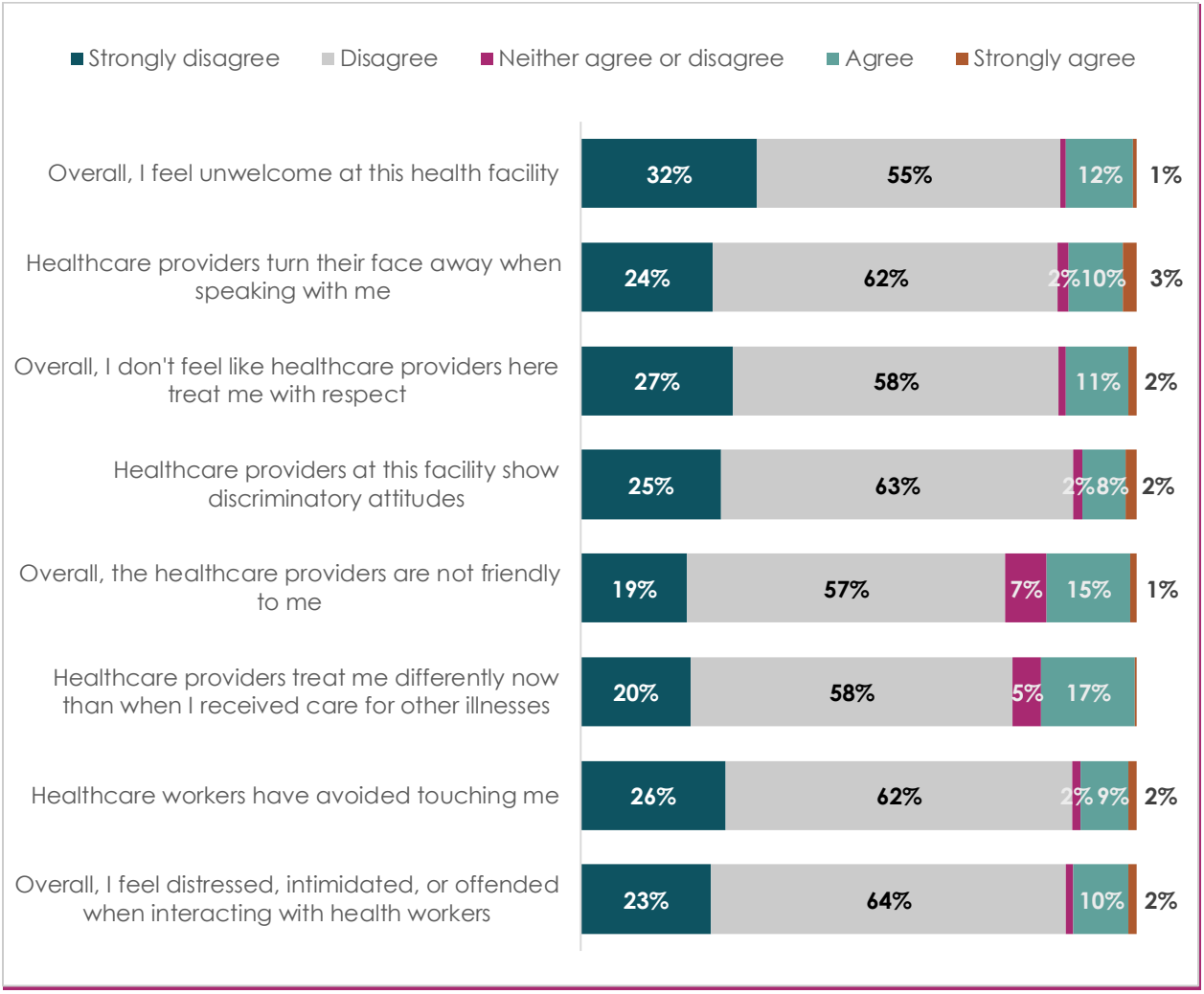


Stigma/Discrimination

The patient interviews included an exploration of the patients' experiences with three different sources of stigma: facility-level stigma, community-level stigma, and self-stigma.

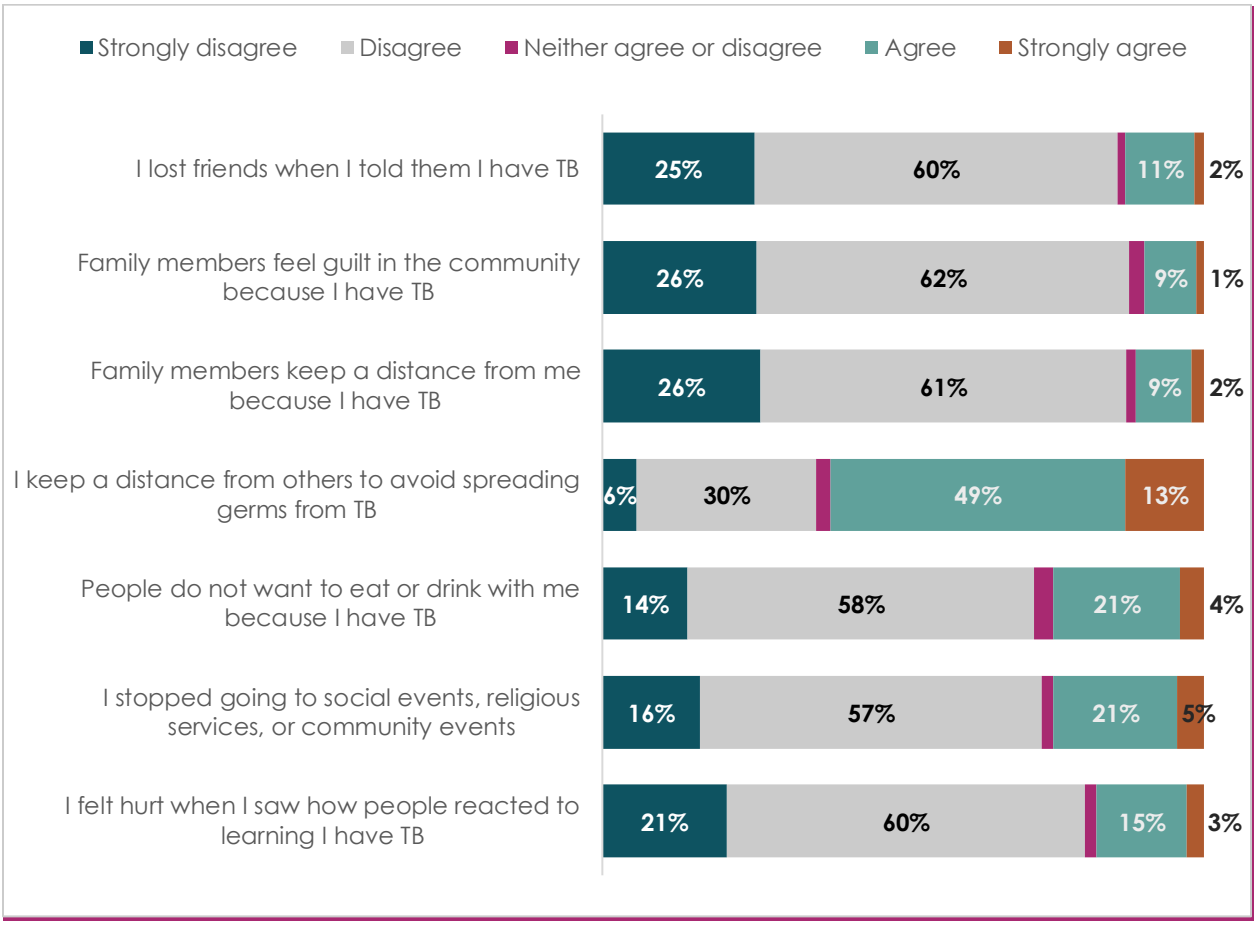
Between 10 percent and 17 percent of the TB patients agreed with the negative statements about how they were treated when interacting with the health facility staff (Figure 25 and Table C3.10). The patients were most likely to agree that health workers were not friendly with them during their interactions (16%) and that the providers treated them differently now that they had TB compared with previously (17%). Ten percent of the TB patients said that the healthcare providers showed discriminatory attitudes toward them.

Figure 25. Patients' perceived feelings of facility-level stigma/discrimination (n=539)



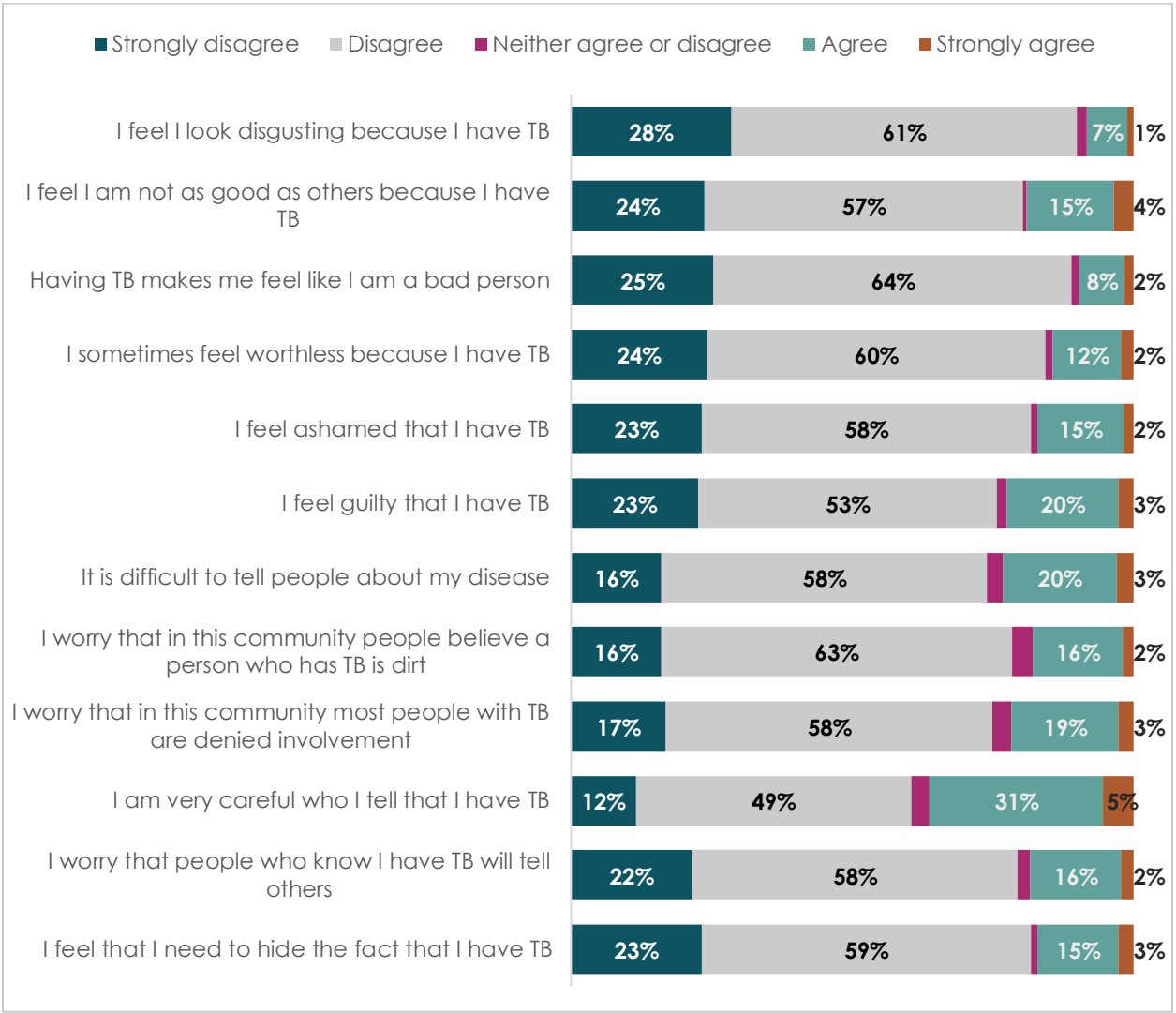
Overall, the patients indicated higher levels of perceived stigma from their communities (Figure 26 and Table C3.10) than from the health facilities. The patients were most likely to agree that they kept a distance from others to avoid spreading TB germs (62%), although that statement could also be linked to feelings of self-stigma (Figure 27 and Table C3.10). About one-quarter of the patients agreed with the statements that people did not want to eat or drink with them because they had TB, and that they had stopped going to social events, religious services, and/or community events.

Figure 26. Patients' perceived feelings of community-level stigma/discrimination (n=539)



The patients reported much higher levels of perceived self-stigma compared with perceived stigma from either the health system or the community level. More than one-third of the patients indicated that they were careful about who they told that they had TB (Figure 27 and Table C3.10). About one-quarter reported feeling ashamed and guilty that they had TB. Just under one-fifth of the patients expressed that they thought that they were not as good as others because they had TB, worried that people with TB in their community were denied involvement in communal activities, and thought that they needed to hide that they had TB.

Figure 27. Patients' perceived feelings of self-stigma/discrimination (n=539)



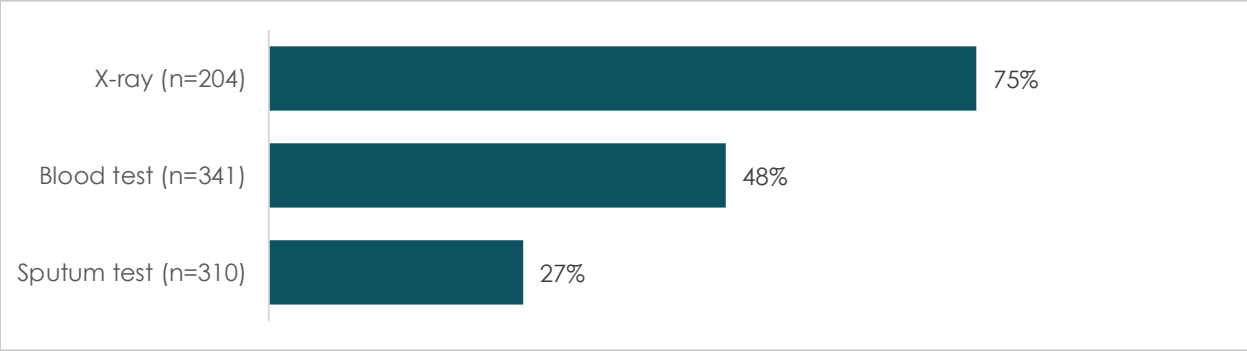
Other Barriers to Care

Understanding the barriers to accessing care was a major focus of the patient interviews, which contained questions about the affordability of the services they required as part of the diagnosis, management, and treatment of their TB disease.

Affordability of TB Care

The patients were asked whether they had received certain diagnosis tests related to their TB care from the health facility and whether they had to pay for them. Thirty-eight percent of the patients reported receiving x-rays, 63 percent reported receiving a blood test, and 56 percent reported receiving a sputum test (data not shown). Figure 28 shows the percentage of patients who reported paying for the tests among those who reported receiving the services. Those who received x-rays were most likely to pay for the tests (75%) (Figure 28 and Table C3.11).

Figure 28. Percentage of patients who paid for diagnosis tests



The patients were also asked about other medical costs incurred for TB services. Only 2 percent of the patients reported that they had incurred any other costs, such as informal payments; 5 percent said that they had to pay to see a healthcare provider for routine TB visits; and 4 percent reported that they were unable to go to the health facility because of the cost (i.e., either transportation to get to the facility or the cost of medical care) (Table C3.11). All but four patients who reported incurring costs related to TB care or who indicated paying to see a healthcare provider were patients who were interviewed at a public facility (health center or hospital).

Patient Satisfaction

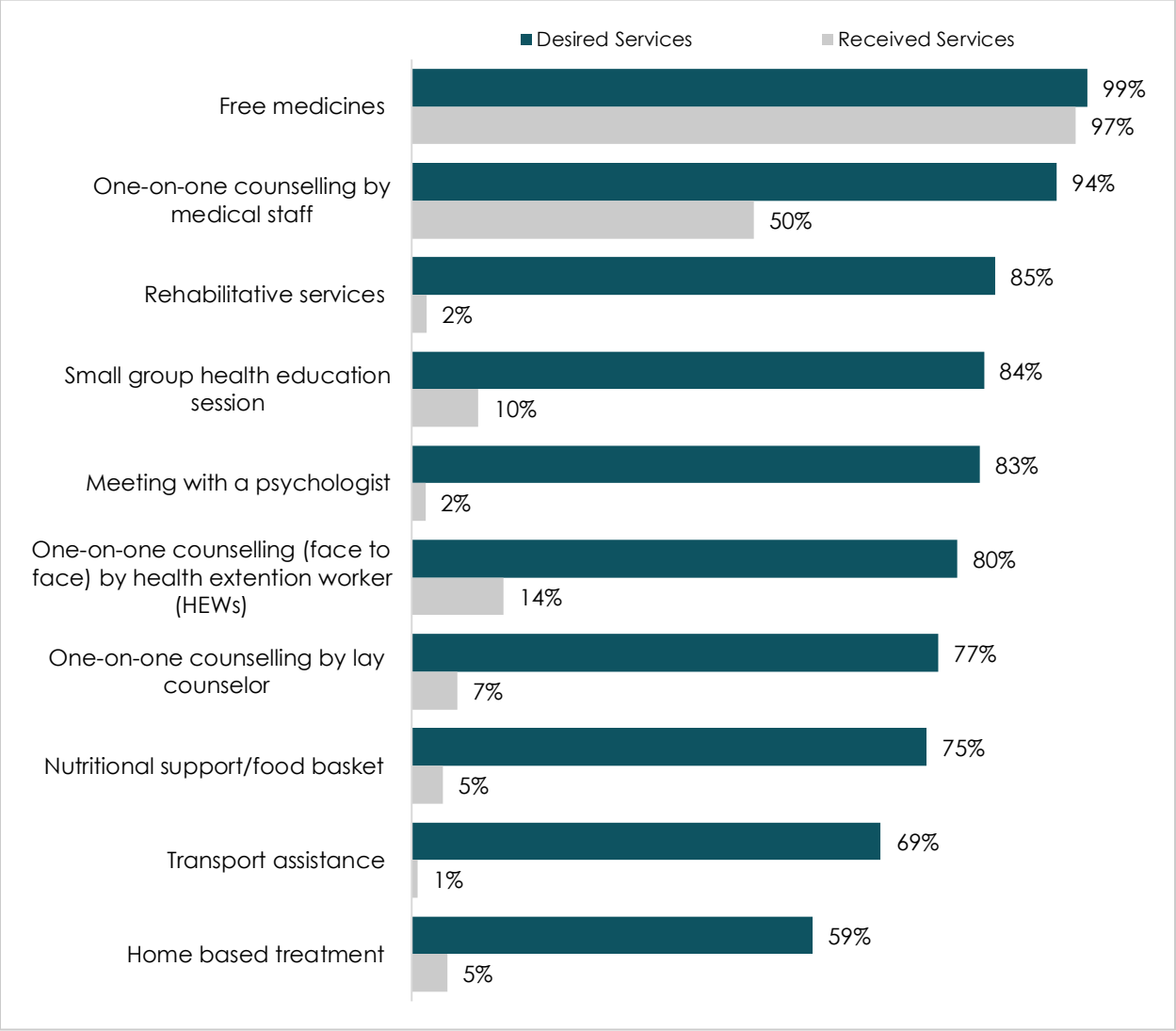
The patients were asked about their overall satisfaction with the TB treatment services that they had received.

Patients' Perspectives about the Services Provided by the Health Facilities

When discussing support services for TB, the patients were asked to indicate what services they wanted to receive and what services they actually received to support them during their treatment (Figure 29 and Table C3.12). Almost all patients interviewed (99%) indicated wanting free TB medicines, and 97 percent received them. On the other hand, for certain services, there were wide discrepancies between what the patients wanted and what they received. For example, although 94 percent and 80 percent of the patients reported wanting one-on-one counseling with medical staff and HEWs, respectively, only 50 percent and 14 percent,

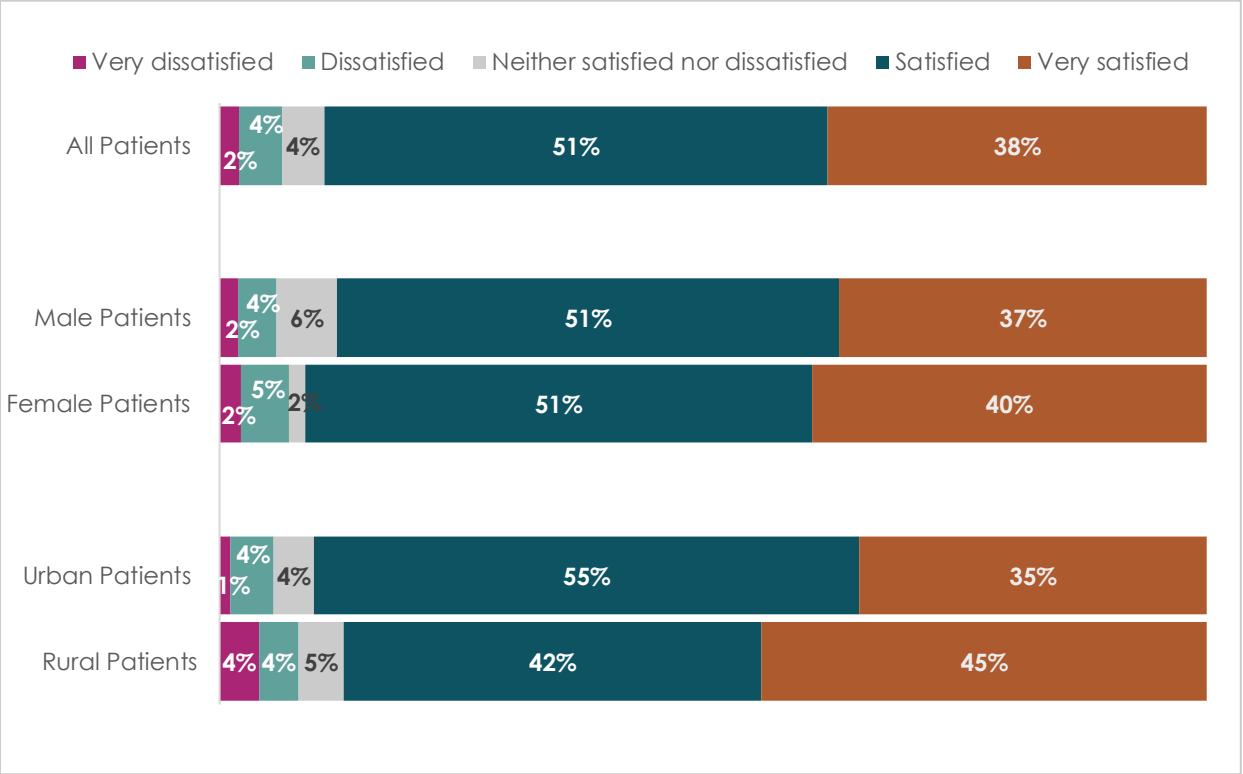
respectively, received such counseling (Figure 29 and Table C3.12). Moreover, a large proportion of the patients wanted rehabilitative services, small group TB health education sessions, and meetings with a psychologist, but a low proportion received these services. In addition, 77 percent wanted counseling sessions with a lay or peer counselor, but only 7 percent reported receiving this counseling; 75 percent wanted nutritional support, but only 5 percent of the patients reported receiving a food basket. Last, 69 percent of the patients wanted transport assistance, but only 1 percent received any, and 59 percent expressed a desire for home-based treatment, which was received by only 5 percent of the patients interviewed (Figure 29 and Table C3.12).

Figure 29. TB support services desired and received by TB patients (n=539)



Although many patients reported wanting services that they had not received, their overall satisfaction was high. About 89 percent said that they were either satisfied or very satisfied with the TB services that they had received (Figure 30 and Table C3.13). The levels of satisfaction varied slightly between male and female patients and between the patients at urban and rural facilities. The highest levels of dissatisfaction were reported by rural TB patients (8%).

Figure 30. Overall patient satisfaction, by gender and residence (n=539)



Outcome Indicators

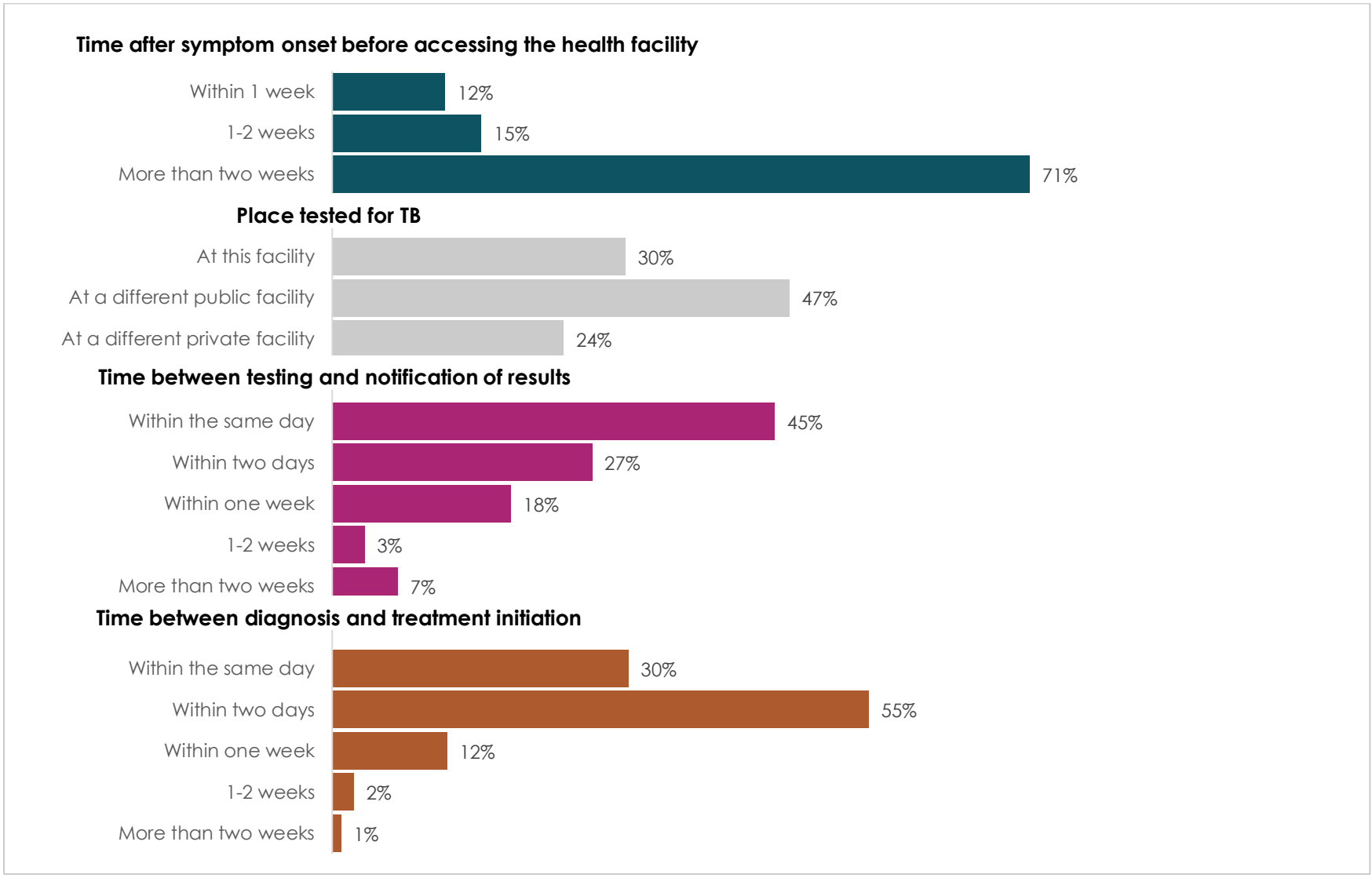
Patient health outcomes are a vital component of an assessment of the quality of TB services. The patient interviews and register reviews provided information on the diagnosis and treatment outcomes.

Timing of Care Seeking, Diagnosis, and Treatment Initiation

The patients were asked about the timing between major steps on the pathway to TB diagnosis and treatment (Figure 31). The majority of the patients (71%) reported that they went to the health facility for an assessment more than two weeks after the onset of symptoms; 15 percent or fewer sought care within one to two weeks of experiencing symptoms.

Almost one-half of the patients interviewed were originally tested for TB at a different public facility, and 24 percent at a different private facility, than the one at which they were receiving TB treatment at the time of the study. Only 30 percent were tested at the facility at which they were receiving TB treatment. The turnaround time for receiving TB diagnosis test results varied across the patients interviewed. Although most patients (45%) received their test results on the same day, 18 percent were notified within one week and 7 percent were notified within two weeks or more. Just under one-third of the patients reported that they had initiated treatment on the same day that they had received their test results, and more than one-half initiated treatment within two days.

Figure 31. Patient's diagnosis and treatment history (n=539)



TB Diagnosis Outcomes

Diagnosis outcomes were calculated using facility registers that had diagnosis data recorded for the period December 30, 2017 to June 27, 2018 to construct a picture of the cascade of care between presumptive TB and clinical diagnosis. In general, diagnosis outcomes were difficult to assess because of missing registers or missing data in the registers.

To assess diagnosis outcomes, the assessment looked at the number and proportion of the types of diagnosis tests recorded for patients (Figure 32). Of the 10,787 patients with presumptive TB who were included in the register review, 58 percent or 6,264 patients had some type of diagnosis evaluation conducted (i.e., smear microscopy, GeneXpert, chest x-ray, clinical assessment). Eighty-nine percent of these patients (n=5,564) had a bacteriological confirmation test (either smear microscopy or GeneXpert), and the remaining 11 percent were evaluated though clinical means, including clinical assessment and/or a chest x-ray. Most of the patients who received bacteriological confirmation test (91%, n=5,058) had test results recorded, and of the patients who had a bacteriological test result recorded, 17 percent (n=925) had a positive bacteriological test result. Of the patients who had some type of diagnosis evaluation conducted, 15 percent or 960 patients had a clinical evaluation, and 25 percent (n=242) had a clinical diagnosis of TB.

Figure 32 attempts to present these data as a cascade of care, from screening to diagnosis, to show the drop-off points; however, it should be noted that the data points are not mutually exclusive (i.e., the same patient may have received both bacteriological and clinical diagnosis).

The study team found that 85 percent of the 2,102 patients who received a smear microscopy test had results (i.e., positive, negative, or inconclusive) recorded in the register, 13 percent of which (n=1,794) were positive smear microscopy results. For the 3,485 patients who received a GeneXpert test, 89 percent had results recorded in the register, 21 percent of which (n=3,116) were recorded as positive (Figure 33 and Table C4.1.).

Figure 32. Diagnosis outcomes recorded for presumptive TB patients (OPD or Presumptive TB Register)

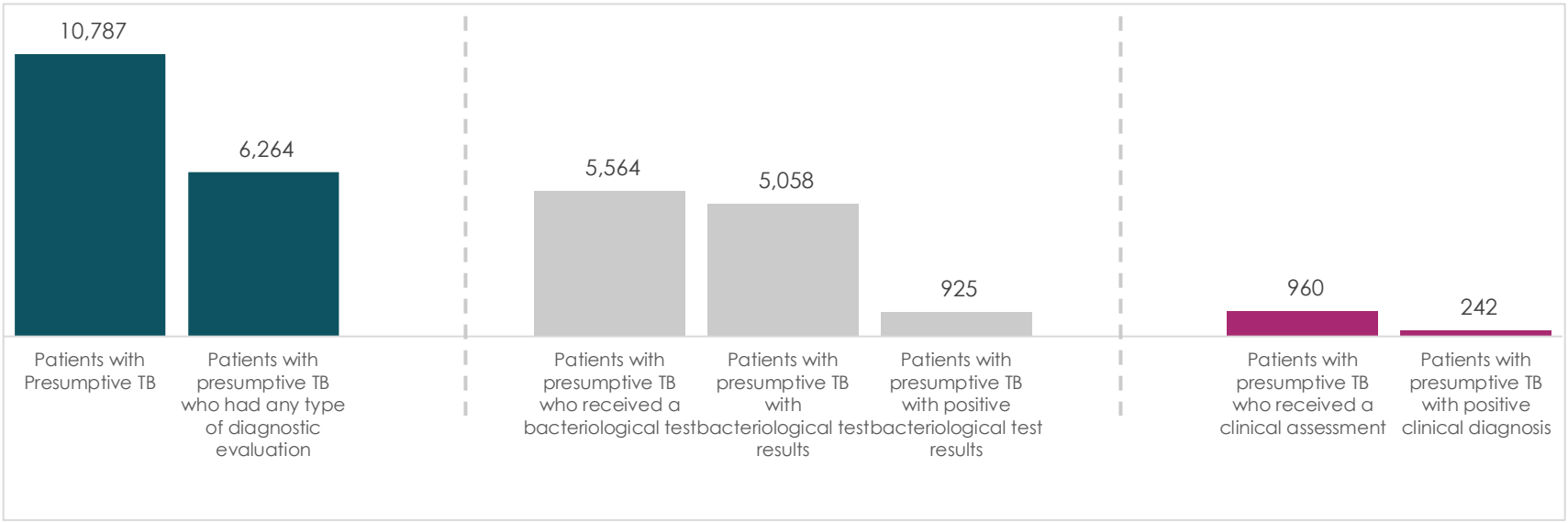
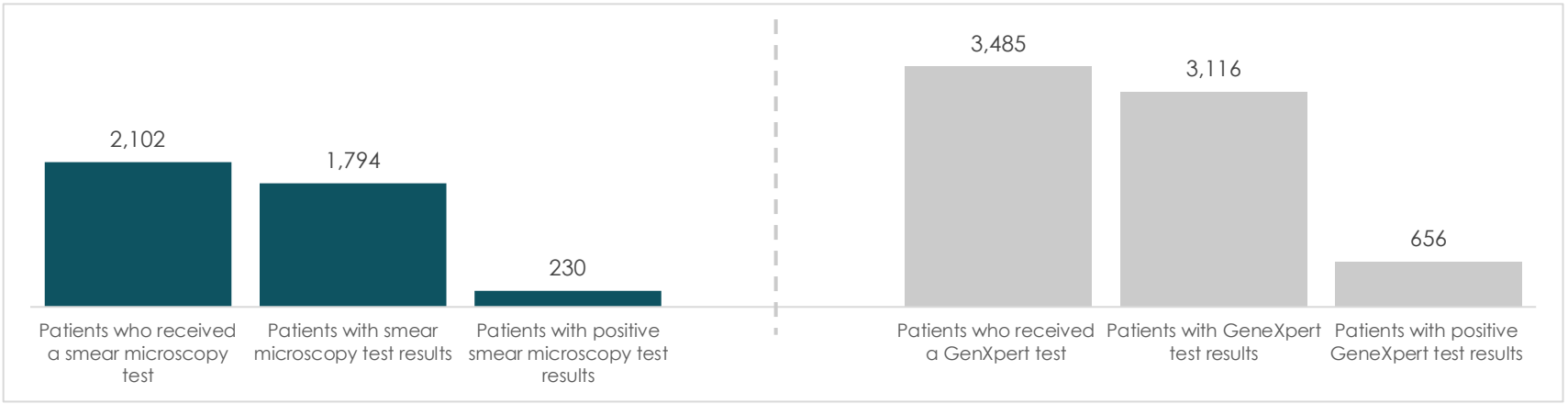


Figure 33. Diagnosis outcomes recorded for smear microscopy and GeneXpert MTB/RIF (OPD or Presumptive TB Register)



As previously mentioned, diagnosis outcomes were difficult to assess because the Presumptive TB Register and the OPD Register were often unavailable or incomplete. The Presumptive TB Register and the OPD Register were used alternatively at facilities; in other words, if a facility had a Presumptive TB Register, it did not use the OPD Register and vice versa. The Presumptive TB Register was developed by a USAID-funded project. It was found in the Addis Ababa City Administration and Amhara and Oromia regions only, and was not universally used by all facilities in these regions.

The assessment also reviewed the outcomes for smear microscopy and GeneXpert tests administered at the laboratory level. Nearly all (95%) of the diagnosis smears submitted to the laboratory had results recorded in the Laboratory Register. However, only 18 percent of these results were received within 48 hours of submission. There was an overall 7 percent positive yield for the smear tests conducted (Table 6). Of the 4,071 smear conversion tests submitted to the laboratory, 96 percent had results recorded, but only 11 percent were reported within 48 hours of submission to the laboratory.

Table 6. Smear microscopy outcomes (TB Microscopy Register)

	No.	%
Diagnosis smears submitted to the laboratory	**12,768**	
Diagnosis smear results recorded in the laboratory (n=12,768)	12,136	95.0
Diagnosis smear results received from the laboratory within 48 hours of submission (n=12,136)	2,214	18.0
Diagnosis smear positive TB results (n=12,136)	866	7.0
Smear conversion tests submitted to the laboratory	**4,071**	
Smear conversion test with results recorded (n=4,071)	3,898	96.0
Smear conversion test results recorded for 2-month follow-up (i.e., the end of the intensive phase) (n=3,898)	1,108	28.0
Smear conversion test results reported by the laboratory within 48 hours of submission (n=3,898)	442	11.0
Negative smear conversion test results recorded in the laboratory (n=3,898)	3,319	85.0

Almost all (99%) of the 24,092 GeneXpert tests submitted to the laboratory had results recorded in the register, 41 percent within 24 hours of submission (Table 7). Two percent of the tests resulted in error, 1 percent were invalid, and 2 percent had no results found.

Table 7. GeneXpert outcomes (GeneXpert Lab Register)

	No.	%
GeneXpert samples submitted to the laboratory	24,092	
GeneXpert test results recorded in the laboratory register (n=24,092)	23,835	99.0
GeneXpert test results reported by the laboratory within 24 hours of submission (n=23,835)*	9,774	41.0
GeneXpert tests with positive result for TB (n=23,835)	2,906	12.0
GeneXpert tests with positive result for resistance to rifampicin (RR) (n=23,835)	155	1.0
GeneXpert tests with negative result (N=MTB not detected) (n=23,835)	19,996	84.0
GeneXpert tests with error result (E) (n=23,835)	524	2.0
GeneXpert tests with MTB detected, rifampicin resistance indeterminate (TI) (n=23,835)	122	1.0
GeneXpert tests with invalid result (I) (n=23,835)	146	1.0
GeneXpert tests with no result (NR) (n=23,835)	389	2.0

*Turnaround of 24 hours could only be calculated by the data collection teams if the laboratory register had both the "date specimen received" and "date reported" columns completed.

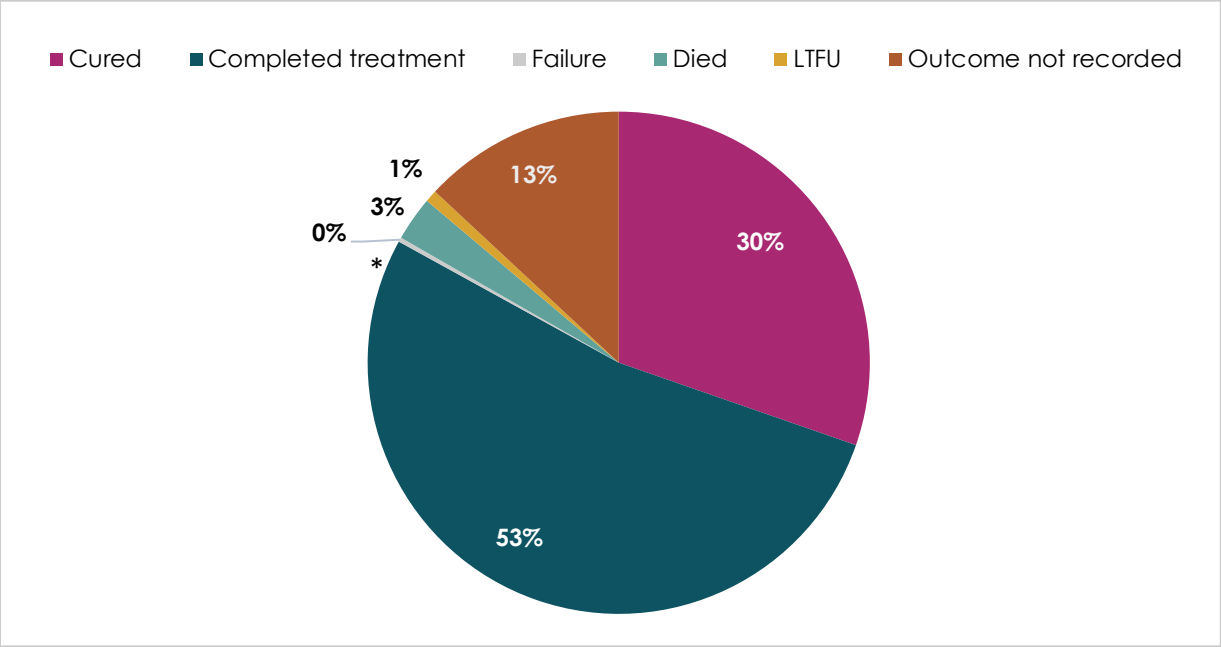
Data in the TB Microscopy Register and GeneXpert Lab Register were relatively more complete compared with the OPD Register, but the issue with these registers was that the facilities were not in the practice of filling out the "date specimen received" column, rationalizing that because they provided same-day results, completing the "date reported" column was sufficient. However, if both dates were not recorded, the data collection teams were unable to calculate the "smear conversion test results reported by the laboratory within 48 hours of submission" or "GeneXpert test results reported by the laboratory within 24 hours of submission" indicators, resulting in these indicator percentage calculations being lower than what they actually were.

TB Treatment Outcomes

TB treatment outcomes were calculated using the Unit TB Register for DS-TB and the Treatment Register for DR-TB. DS-TB outcomes were evaluated for patients who started treatment between December 30, 2017 and June 27, 2018. For DR-TB, outcomes were evaluated for patients who started treatment between June 28, 2016 and May 28, 2017.

As Figure 34 (and Table C4.2) show, 30 percent of the DS-TB patients were cured and 53 percent completed treatment, giving a treatment success rate of 83 percent. Fewer than 1 percent were listed as having treatment failure, 3 percent died during treatment, and just under 1 percent were classified as LTFU. Another 13 percent of the cohort did not have an outcome recorded. This group included patients who were transferred-out to another facility, in which case, the receiving facility would be responsible for recording the patient's outcome. Appendix B provides detailed definitions for each treatment outcome.

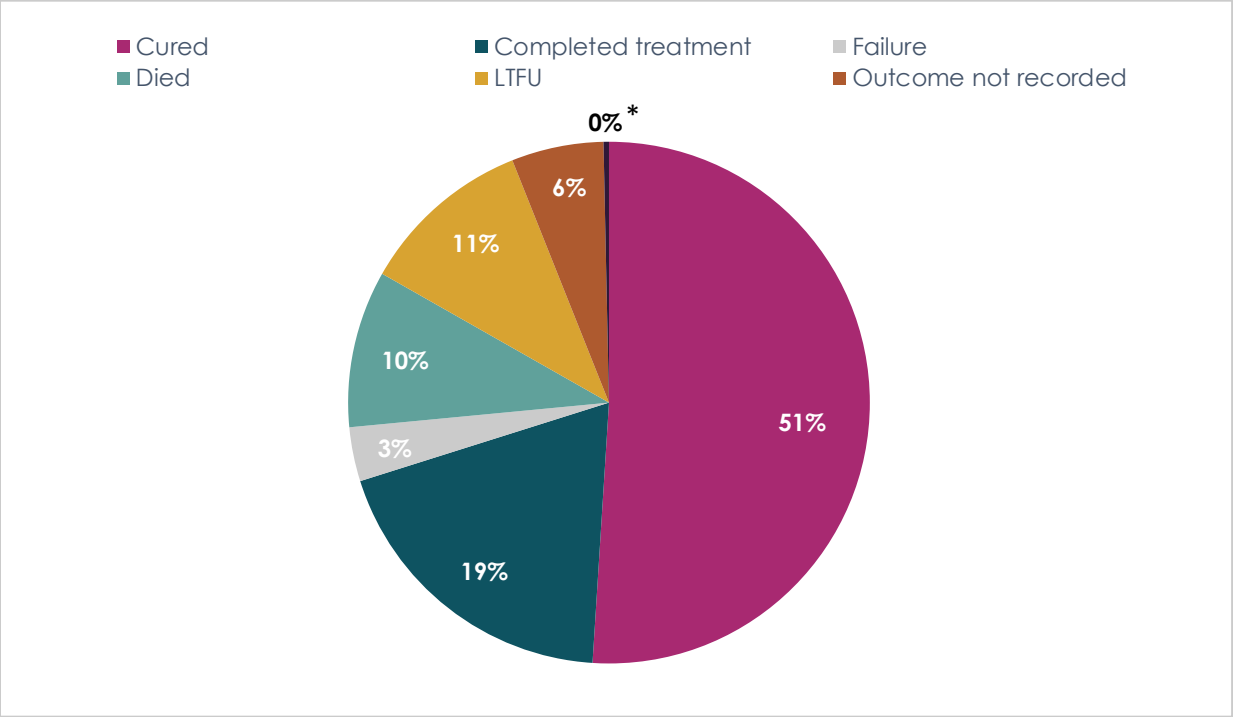
Figure 34. New DS-TB treatment outcomes (Unit TB Register) (n=5,244)



*0% due to rounding; 15 patients in the cohort were recorded as "failure."

Fifty-one percent of the patients treated for DR-TB were recorded as cured and 19 percent were recorded as completing DR-TB treatment, giving a treatment success rate of 70 percent (Figure 35 and Table C4.3). Three percent of the patients failed DR-TB treatment and were moved to pre-extensively drug-resistant (XDR) treatment; 10 percent of the patients died during treatment; and 11 percent were recorded as LTFU. Another 6 percent did not have an outcome recorded.

Figure 35. DR-TB treatment outcomes (DR-TB Treatment Register) (n=298)



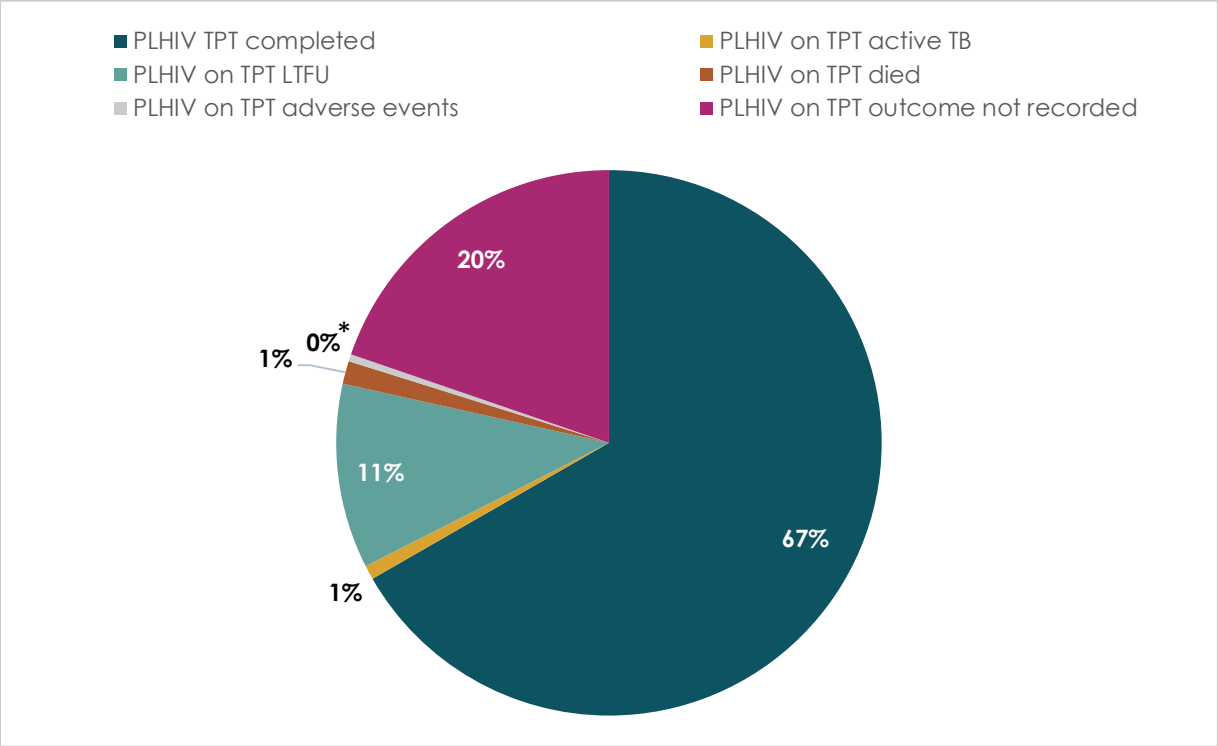
*0% due to rounding; one patient in the cohort was recorded as "moved to pre-XDR."

TPT Outcomes

The outcomes for TPT were assessed for PLHIV and children who started TPT between December 30, 2017 and June 27, 2018. The ART Registers and Contact Screening Registers were used to review TPT outcomes for PLHIV and children because the TPT logbooks were often unavailable at the facilities. In many cases, the Contact Screening Registers were also unavailable or were incomplete at many facilities.

Two-thirds of the PLHIV who were initiated on TPT during the period of review were documented as completing a six-month course of TPT (Figure 36 and Table C4.4); approximately 1 percent of the patients developed active TB and were moved to TB treatment, and another 1 percent died while on TPT. Eleven percent of the patients were LTFU while on TPT and another 20 percent did not have an outcome recorded.

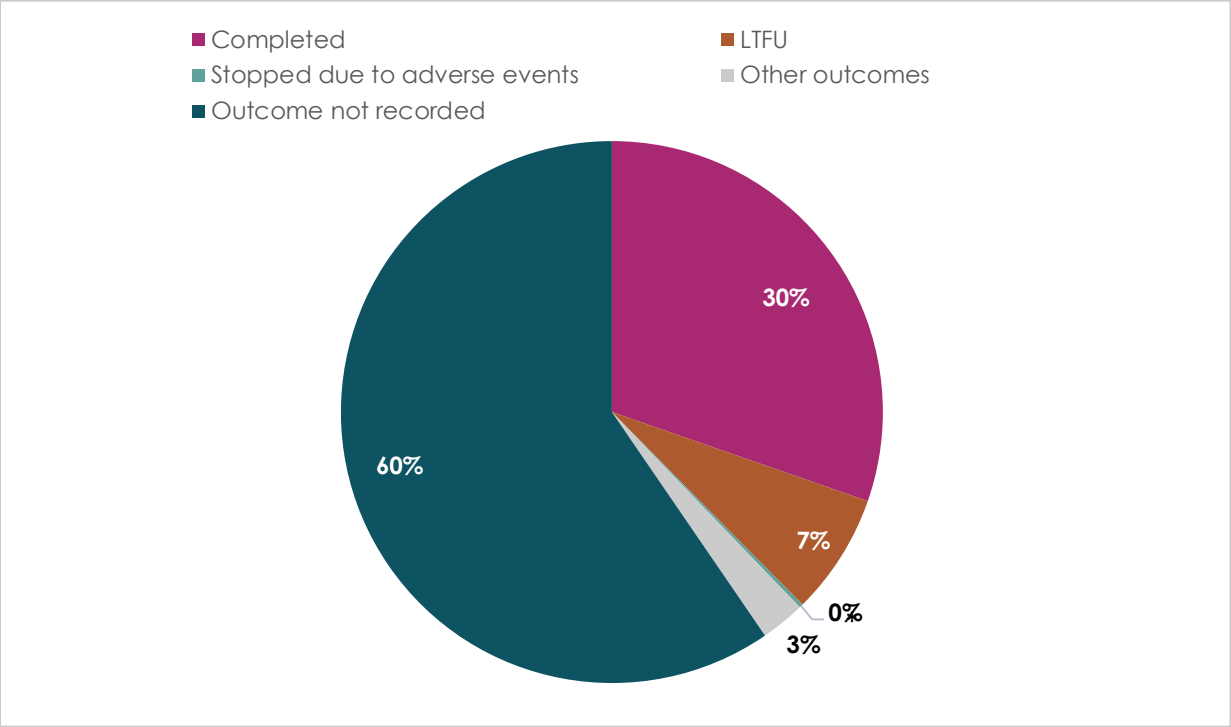
Figure 36. Outcomes of PLHIV on TPT (ART Register) (n=2,140)



*0% due to rounding: 11 patients in the cohort were recorded as terminating TPT due to "adverse events."

The majority of the children under 5 years of age initiated on TPT (60%) during the period of review had no outcomes documented in the register (Figure 37 and Table C4.5). Thirty percent were listed as completing the six-month regimen of TPT; 7 percent were reported as LTFU; fewer than 1 percent stopped TPT due to adverse events; and 3 percent were documented as having other outcomes.

Figure 37. TPT outcomes for child contacts under 5 years (TB Contact Screening Register) (n=455)



*0% due to rounding: one patient in the cohort was recorded as terminating TPT due to "adverse events."

CHALLENGES AND LIMITATIONS

This section highlights the challenges and limitations of the assessment for both the data collection and the interpretation of the findings.

Challenges

Time required to conduct the study: Although the QTSA fieldwork was completed relatively rapidly, the planning and preparation phases, which were extensive and included recruiting a local implementing partner, customizing the QTSA tools to the country context, getting institutional review board approval, pretesting the tools, and conducting the training for data collectors, took one year, which was longer than expected due to some bottlenecks. Careful planning and early attention to the challenges that arise can help ensure that the tools reflect the most recent programmatic context and the results can be more quickly disseminated and used for planning and implementation.

Unavailable and incomplete registers: Gathering the required data from facility registers to review the outcomes was one of the biggest data collection challenges. Registers were either not available, only partially available for the period of review or, in many cases, available, but incomplete. Although data quality was a challenge across all data elements reviewed, it was especially poor for data for presumptive TB screening and TPT completion for TB exposed children. Because these data were largely incomplete, the register review analysis had gaps that impaired and limited the generalizability of the findings.

Difficulty finding HEWs: Health centers that work with HEWs were asked to have their HEWs report to the health center on the day of data collection so that they could be included in the provider sample. Despite the best efforts of the data collectors, it was not always possible to find the HEWs for interviews. In some instances, the field supervisor had to travel to the health posts or search for the HEWs in the villages where they were deployed and bring them back to the health center for interviews, or sometimes interview them on the spot. This challenge could have biased the sampling of this cadre.

Security concerns: Civil unrest and instability were causes for concern in some settings. In a few cases, the data collection teams were forced to change their route plans ahead of time because of security concerns. One team was stranded at a facility and spent the night there due to roadblocks following civil unrest.

Limitations

The facility sample included health centers and higher-level facilities only; it did not include the health post level. As a result, the majority of the facilities sampled were located in urban areas. Because health posts were not included in the sample, information about community linkages was restricted to responses/information provided by the HEWs, without the added dimension that would have been possible if health posts had been included in the facility audit and register review components of the assessment. It is recommended to include the health post level if the QTSA is repeated in the future.

In this study, we relied extensively on self-reported practices of the clinicians, which may have overstated the true incidence of "correct" practices. Such a methodology is subject to the well documented "know-do" gap (discussed earlier in the report), in which providers do not actually implement a specific practice, even though they know that it is correct. The patient interview tool was designed to mirror the provider interview tool to

allow the study team to cross check practices reported by providers against practices reported by patients, but this was not possible for all questions.

The patients targeted for interviews were mostly limited to those who came to the facility on the day of the assessment. This was done to remove the bias that would have been created by having providers recruit patients. Nevertheless, the method used introduced potential selection bias because it eliminated the potential to interview patients who did not frequent health facilities, such as those who receive treatment at the community level, those who have stopped treatment, or those considered LTFU. The patients who were at the facilities on the day of the assessment may have had different characteristics than the full cohort of all current TB patients, and also different health-seeking behaviors, perceptions, and beliefs.

It was also often difficult for the data collection teams to reach the patient interview quota per facility by relying on interviewing the patients who were visiting the facility on the day of the assessment. Revisits were sometimes needed to reach the quota. However, at some facilities, even with revisits, there were so few patients on treatment and none scheduled for a follow-up visit at any time in the near future that the data collection teams had to target patients from the facility register and seek them out at their homes.

Last, there was a potential for desirability bias in the patient interviews because most interviews were conducted at the health facilities. The patients reported high levels of satisfaction and low levels of stigma from facilities and service providers, which could be somewhat influenced by the fact that they were interviewed at the facility. Further studies using qualitative methods are recommended to delve deeper into the issues of stigma and discrimination.

KEY FINDINGS AND RECOMMENDATIONS

On completion of the assessment, MEASURE Evaluation organized a data review meeting with the NTLP, USAID/Ethiopia, and SART in Addis Ababa in February 2020 to share the preliminary QTSA findings and obtain stakeholders' feedback. This section presents the key findings that were presented and prioritized at this meeting, along with recommendations for policy and programmatic consideration directed at the NTLP and other TB stakeholders. The findings and recommendations are organized by the three components of the TB Quality of Care framework: structure, process, and outcomes.

Structure

TB screening: The study reveals the inadequate monitoring and tracking of presumptive TB cases at the health facility level, primarily due to the lack of a system and tools to allow facilities to do so. Under Ethiopia's current TB service delivery model and M&E system, TB patient monitoring starts once a patient is enrolled in TB treatment, at which point he or she is registered in the Unit TB Register or the DR-TB Treatment Register and tracked through the treatment phase. However, to end TB, active case finding and the identification of missed cases needs to improve, which require improved monitoring and tracking of presumptive TB cases by health facilities and at the community level.

Lab infrastructure and rapid diagnosis: The GeneXpert MTB/RIF test is the primary screening and diagnosis test for the identification of RR-TB in Ethiopia; however, the availability of GeneXpert machines is still relatively limited. Of the 185 facilities assessed, only 33 have GeneXpert onsite. Most facilities in the study that reported using GeneXpert for TB diagnosis (70%) do not have machines onsite; rather, they are networked to facilities with machines to which samples are sent for testing. Although there have been improvements in recent years in scaling up GeneXpert and networking facilities that have machines with those that do not, expanding access to rapid diagnosis services should continue to be a key programmatic priority for the NTLP.

Almost all facilities that reported having GeneXpert onsite were found to have at least one functional GeneXpert module available on the day of the assessment. However, only 88 percent of these facilities had at least one valid Xpert MTB/RIF cartridge available, which is of concern. The NTLP should investigate whether this was because of an overall low national supply at the time of the assessment, or whether it was a stock management issue specific to the facilities assessed and respond accordingly.

Drug availability and storage. Although both DS- and DR-TB treatment drugs were available, stockouts of isoniazid were found at the majority of sites assessed (72%). Although most storerooms met the basic guidelines for appropriate storage conditions, only 32 percent were found to keep items stored at an appropriate temperature.

Community linkages: HEWs play a critical role in TB prevention and care in Ethiopia. Stationed at health posts located in communities, they represent the lowest-level service provider in the health system. Although this assessment did not include the health post level in the facility sample, HEWs are included in the provider sample and questions about HEWs are in the facility audit. Almost three-quarters of the facilities report that they provide community-based DOTS through HEWs. Moreover, upwards of 90 percent of the facilities that work with HEWs report that they provide several other services to TB patients, including adherence

counseling and contacting patients who miss appointments. Interestingly, however, only 14 percent of the patients report that they receive one-to-one counseling from HEWs, and only 6 percent report using a HEW as their treatment supporter. Similarly, although the majority of the facilities report that their HEWs contact patients who miss their appointments, only one-quarter of the HEWs report doing so. These results suggest that there is a need to assess TB service provision by HEWs to determine whether gaps exist, and if so, assess why.

TB infection control: Approximately one-third of the study facilities report having a system in place to routinely screen facility staff for TB, revealing that most facilities have no way of identifying and following-up providers with TB. It is also unclear whether the facilities that report having a "system" actually have a formal system in place under which they consistently and periodically screen all staff, or whether the screening is done informally and/or sporadically. It is alarming that 19 of the 69 facilities (28%) that have a screening system to track TB among staff report that they had a staff member diagnosed with active TB disease in the past year.

Laboratory QA/QC procedures: When assessing the QC measures used by facilities for smear microscopy and GeneXpert, about 70 percent of the facilities undertaking smear microscopy indicate that they use both internal and external QC measures. Slightly more than one-half (56%) of the facilities performing GeneXpert testing report using both internal and external QA measures. Moreover, 7 percent of the facilities conducting smear microscopy testing and 13 percent of the facilities using GeneXpert report that either no QA/QC procedures are being used or that staff are not aware that any QA/AC procedures are being used.

Availability and use of national guidelines: The National Guidelines for TB, DR-TB and Leprosy in Ethiopia (Sixth Edition) are found in fewer than one-half of the study facilities. Coupled with the report from 40 percent of the facilities that they provide self-managed, home-based treatment to TB patients in the absence of a treatment supporter to at least one patient over the past year (a practice that is not recommended by the guidelines), there is concern that the facilities may not be strictly adhering to national TB diagnosis and treatment protocols.

Urban/rural disparity in the availability of services: The study shows that more facilities in urban settings provide certain TB services compared with facilities in rural areas. For example, all 12 DR-TB TICs are located in an urban setting, whereas only nine of the 58 TFCs are in a rural setting.

Recommendations

- The NTLP is advised to review the current TB M&E framework to align with the End TB framework and recommendations, and assess the robustness and comprehensiveness of health facility-level TB monitoring. Recommendations include the integration of TB screening, diagnosis, and TB preventive therapy performance tracking indicators in the national District Health Information Software, version 2 (DHIS2), and the concomitant strengthening of TB recording and reporting tools.
- Expand access to rapid diagnosis services, including DST, by optimizing existing networks for GeneXpert and by procuring new machines. The NTLP is advised to optimize the functionality of existing GeneXpert networks by identifying and resolving bottlenecks, such as GeneXpert cartridge stockouts, overly long turnaround times for test results, quicker machine maintenance, and other related challenges. The NTLP is also advised to have a phased procurement strategy in place to obtain more machines to reach the national target of one GeneXpert machine per woreda.

- In addition to expanding access to rapid diagnosis services, QA/QC practices for these laboratory procedures should be expanded and monitored to ensure a high level of testing quality with service expansion.
- Use HEWs more effectively to improve active case finding and ensure that patients are brought into the healthcare system in a timely manner for TB diagnosis and treatment. Further investigate which TB support services the HEWs are actually providing, and why patients may not be using certain services provided by the HEWs. As the link between the health system and the community, HEWs are vital for adherence promotion and general patient monitoring during treatment. If their services are not being fully used, resources should be invested to reveal potential bottlenecks.
- All facilities should have a system in place to routinely screen healthcare workers for TB and track TB incidence among health workers as part of standard infection control measures.
- Ethiopia has implemented several new programmatic advances linked to TB diagnosis and treatment, such as the roll-out of GeneXpert, DST, and the newer short-course treatment regimens. The NTLP should have a training plan in place to ensure that all providers, clinicians, and HEWs are up to date on the newest programmatic advances. One challenge that the FMOH faces for any training plan is the policy of frequent staff rotations at health facilities, which often means that those staff who are trained in TB get reassigned elsewhere in the facility.
- Considering that 79 percent of Ethiopia's population is rural, the NTLP should continue to develop strategies to improve access to essential services, including TB, for rural populations.

Process

Patient satisfaction: The study shows that, on the whole, TB patients are satisfied with the TB services they receive. However, the interviews reveal big gaps in the services that patients say that they receive at the facilities compared with the services that they desire. Except for free TB medicines and counseling by medical staff, there is a gap of upwards of 50 percent between what patients want and what they receive. Although financial constraints will not allow the NTLP to provide all services desired by patients, some services, such as group counseling sessions, should at least be considered for future programmatic intervention by the NTLP and its partners.

Patient-provider interactions: The study shows discrepancies between the TB services that facilities report providing compared with the services that patients say that they receive. For example, more than two-thirds of the facilities report providing some form of psychosocial support to TB patients, and among these facilities, almost all report that their clinical staff provide one-on-one patient counseling. By contrast, only one-half of the patients report receiving one-on-one counseling from clinical staff, and 14 percent or less report receiving counseling from HEWs, peers, or a psychologist. In some instances, the difference is probably driven, in part, by differences in how patients understand words, such as "counseling," compared with the providers. For example, a provider's definition of counseling could be very technical and medically focused whereas a patient's definition could be broader and include non-medical aspects of health and well-being.

Patient TB knowledge: Patient TB knowledge is generally good, and patients are aware of the linkages between TB and smoking, overcrowding, etc. TB knowledge in the community was not assessed in this study,

but would likely be lower. According to patient reports, there are gaps in TB-related information that providers share with them, including information about the side effects of TB medications and what to do if they experience them. This indicates that there are specific areas where patient knowledge could be strengthened through enhanced counseling and other means of awareness raising.

Barriers to accessing care: Among the patients who report receiving the service, 75 percent pay for x-rays and 27 percent for sputum tests associated with the diagnosis of TB—services that should be free of charge. A small proportion of the patients indicate that they are unable to attend the health facility because of these costs. The NTLP may need to consider patient costs for x-ray diagnosis if it plans to use it for screening purposes.

Recommendations

- The NTLP should critically examine the TB services package and consider reframing the programmatic approach from one focused on treatment provision to one focused on the delivery of a full range of TB services, including case finding, counseling, and rehabilitative services. Moreover, the service package should incorporate the values of patient-centered care, address patient needs, and mitigate any financial burden on patients. The use of a simple, standardized socioeconomic assessment checklist can help identify the most vulnerable or most needy patients, and help link them to locally available social safety net services.
- The NTLP should design and roll out a feasible package of patient-centered adherence strategies that are tailored to specific patient realities and needs. Interestingly, although it is not a national policy, the majority of the facilities report that they use reminder phone calls or SMS texts to support patient adherence and to follow up with patients when they miss an appointment, although it was not clear how consistently or frequently they use such mechanisms. More operational research is needed to examine the feasibility of digital technologies, like SMS texts, to support adherence, as patient reminders and to trace LTFU.
- The NTLP should consider implementing community-level TB awareness campaigns and events at which people can also be screened and tested for TB. These campaigns will not only improve patient knowledge about TB, but will also improve case finding and lower the number of missed cases over the long term.
- The NTLP should develop and use structured patient education tools to bring uniformity to the content and quality of patient counseling, whether through one-on-one counseling with a medical staff member, HEW, or peer.

Outcome

TB diagnosis and linkage to care: Nearly one-half of the patients interviewed said that they were initially tested for TB at a different public facility from where they were receiving treatment at the time of the study, and 24 percent said they were tested at a different private facility. Only 30 percent were tested at the same facility where they were receiving treatment. First, this finding shows a significant contribution of the private sector to TB diagnosis. Second, this demonstrates that the majority of the patients are diagnosed at one facility and referred to another for treatment, highlighting the need for a strong referral tracking system between health facilities to show referral completion, to minimize pre-treatment LTFU, and to ensure that all diagnosed patients are linked to, receive, and complete treatment.

Diagnosis outcomes: Diagnosis outcomes were generally difficult to assess in this study because of limited data availability and completeness. There is no standardized national presumptive TB register, other than the general OPD Register, which is used to capture presumptive TB data. Because the OPD Register is not TB-specific, the TB data elements in the register are not complete. The study finds that the regions that use a USAID-funded project-based Presumptive TB Register, and where there is a system to track presumptive TB cases, have better data quality. However, this register is in limited use and has not been adopted as a tool in the national health management information system. Likewise, the quality of the laboratory registers, although better than the OPD Register, nevertheless have weaknesses that should be addressed through training. Because of the magnitude of missing data, it is difficult to have an accurate picture of the diagnosis outcomes.

TB treatment outcomes: The treatment success rate for DS-TB patients is 83 percent, lower than the routine national treatment success rate report, which is usually greater than 90 percent. Thirteen percent of the patients in this cohort do not have any outcome recorded in the register, pointing to a data quality gap. It is possible that some of the patients who do not have an outcome recorded actually completed treatment, but there is no way to verify this without improvements in data quality to ensure that all TB treatment outcomes are meticulously recorded. The treatment success rate for DR-TB patients is 70 percent. Six percent of the patients in this cohort do not have any outcome recorded in the register by the twenty-fourth month since treatment initiation, which is acceptable due to delayed conversion or treatment interruption. The NTLP should look into the final outcome at 36 months to ensure that all patients have their final outcomes assessed and documented.

TB preventive therapy outcomes: Seventy-one percent of the facilities report providing TPT to children under five, and 46 percent report providing it to children between ages five and 15; however, it should be noted that tracking TPT provision in older children is a new requirement and national systems had not been fully updated to monitor performance in this age category during the time frame reviewed. Ninety-two percent of the facilities that provide HIV care and treatment services to TB/HIV coinfected patients report providing TPT to PLHIV.

Thirty percent of children under 5 years of age who were initiated on TPT during the period reviewed were recorded as completing the six-month TPT regimen, however, the majority (60%) do not have any outcome recorded. Two-thirds of the PLHIV who were initiated on TPT during the period reviewed are recorded as completing a six-month course of TPT and 20 percent do not have any outcome recorded.

The register review reveals big data quality challenges for TPT, especially among children. First, the data sources (especially the TPT logbooks and Contact Screening Registers) were often unavailable or incomplete, requiring that the data collection teams calculate TPT outcomes using whatever sources are available. Second, the high rates of LTFU and no outcome recorded, for both groups but especially for children, indicate weak monitoring and follow-up, in addition to weak data quality. Third, there is an issue with the consistent availability of TB medicines recommended for TPT, such as isoniazid, which was available at only 28 percent of the facilities assessed.

Recommendations

- The NTLP should expand the TB M&E system to monitor the screening of presumptive TB cases by including routine performance indicators for TB screening and diagnosis practices in the national DHIS2

to enable the identification of pre-treatment LTFU. One way to do this is to reinstate the Presumptive TB Register and roll it out nationally.

- Strengthen TB service referral mechanisms by: instituting a TB service directory and referral tracking system to facilitate TB patient referral and linkage to treatment; mandatory TB case notification by all TB care providers to the NTLP and inclusion of health facility TB case detection performance; and further expansion of TB services to private care providers through PPM-DOTs.
- Improve TB data quality and minimize missing data, such as the large number of patients with no TB treatment outcomes recorded, by institutionalizing routine data QA mechanisms, such as conducting woreda-wide monthly or quarterly data/register review meetings. A longer-term solution is to introduce an electronic case-based TB patient management system, which would be linked across all facilities providing TB services.
- Conduct data quality assessments of routinely collected TB data to improve TB data quality and TB recordkeeping practices. TB focal persons should routinely use ongoing supervision visits to address TB data quality issues in a holistic manner, such as reviewing and rectifying data quality lapses in the Lab Register, the Contact Screening Register, and other relevant registers, as required, as opposed to focusing primarily on the Unit TB Register, where data quality is relative better compared with other sources.
- In 2020, the global TB program updated its preventive policy guidelines to ensure that countries scale up TPT to the level needed to make an impact on TB incidence (WHO, 2020). As one of the high TB/HIV burden countries, Ethiopia should revisit its national TB preventive policy, strategies, and implementation framework to stay on track to achieve the UNHLM target of starting 24 million contacts of people with active TB and 6 million PLHIV on TPT by 2022. The updated global guidelines recommend that, at a minimum, countries monitor three priority indicators: (1) contact investigation coverage (the percentage of contacts of bacteriologically confirmed TB patients who are evaluated for TB disease and TB infection among those eligible); (2) TPT coverage (the percentage of people initiated on TPT among those eligible); and (3) TPT completion (the percentage of people completing TPT among those initiating treatment). This will require both programmatic improvements, such as more vigorous contact tracing and monitoring, improvements in reporting and recording of TPT data, and collaborative site-level support and supervision from the national TB and HIV programs on TB/HIV collaborative programmatic elements.

CONCLUSION

The Ethiopia QTSA results highlight both strengths and weaknesses in the quality of the NTLP's TB program. The study shows strengths in terms of the wide availability of key TB services, such as TB diagnosis, treatment, and follow-up; high levels of availability of the most commonly used first-line and second-line TB drugs; good treatment success rates for DS- and DR-TB patients; and high levels of patient satisfaction. The study also identifies programmatic gaps, for example, in the availability of rapid diagnosis tests; TPT coverage and proper recording and documentation across the multiple registers used to capture and report TB-related data. These findings provide evidence of the key elements that the NTLP should target to improve the availability of high-quality TB care services across Ethiopia and optimize patient treatment outcomes.

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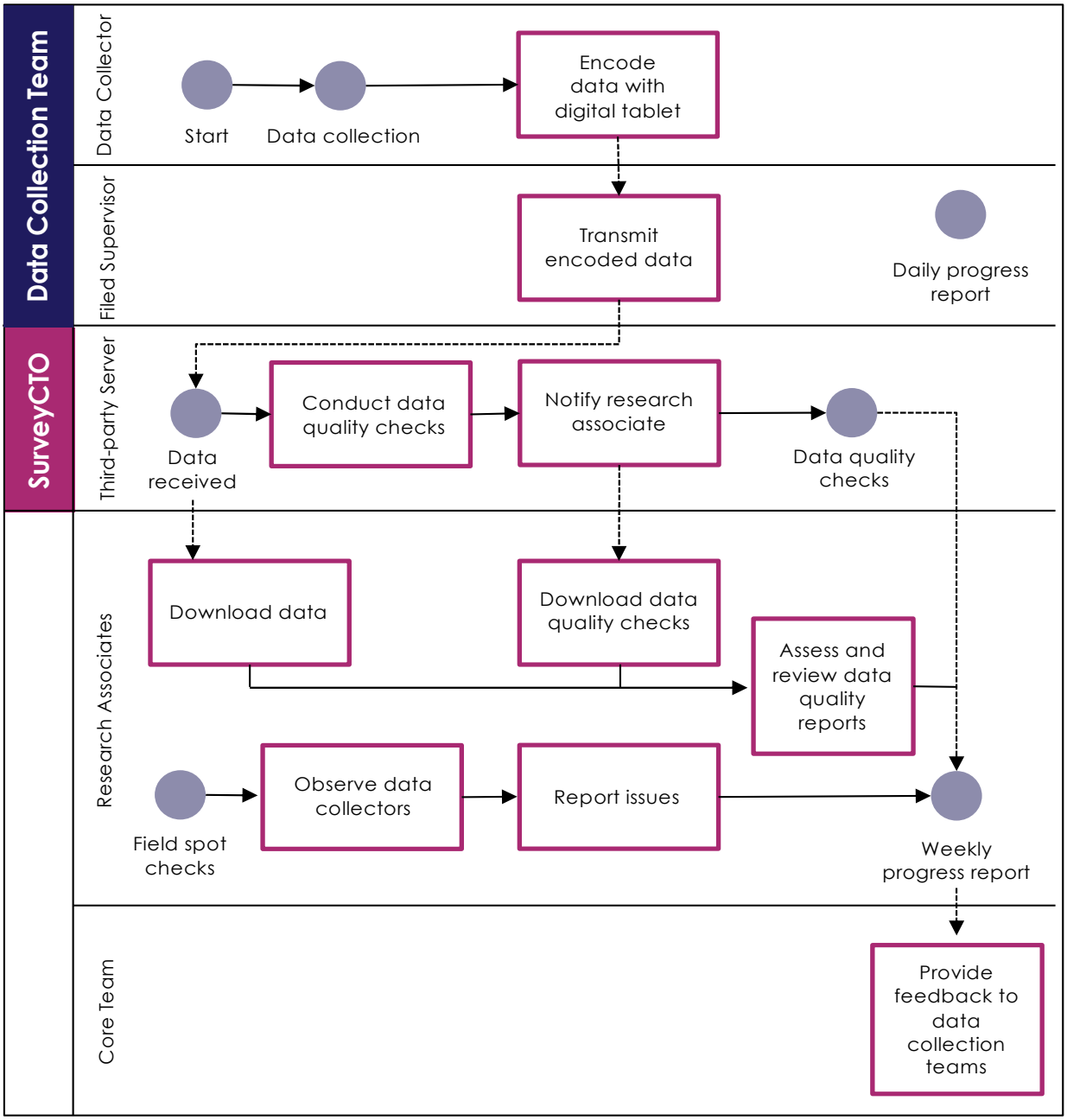
APPENDIX A. DATA MANAGEMENT

Data quality was ensured through the following mechanisms: in the tools, daily progress reports, field spot checks, weekly progress reports (WPRs), and data quality checks (Figure A1).

Figure A1. Data management flowchart



SurveyCTO allowed for real-time data management as the tools were being administered. Data quality was assured by data limits, skip logic, and required responses in the tools. The data collectors were not allowed to enter anything that was lower or higher than the set limit. If there were any exceptions to the limits, they were

reported to the research associates so that the dataset could be changed, and when appropriate, the tool could be adjusted. Skip instructions were important to determine the right questions to ask the respondents. For example, if a service was not available at a facility, questions pertaining to that service were automatically skipped by SurveyCTO. The mechanism for required responses meant that SurveyCTO would not allow the data collectors to move on to the next question until a response was entered.

Data quality was ensured at the level of the field supervisors through the daily progress reports, which were submitted per facility visited. They were used to track the progress, challenges, and best practices of the data collection teams. Each member of the data collection team was assigned to a specific tool. Once a tool was completed, the field supervisor checked for data quality and completion. When they were satisfied, field supervisors transmitted the data to the server. Then, they reported the number of tools completed on the day of their visit, and the status of the interviews (e.g., completed interviews, patient refusals, and ineligible patients). This was also a way for the data collectors to report any schedule changes that were necessary. Schedule changes varied, but most of the time they were attributable to the lack of patients, facility refusals, and difficult weather conditions.

To ensure that the data collection protocol was followed and that good data quality was obtained, the research associates conducted spot checks during the data collection period. One spot check was done per data collection team. Each spot check lasted three to five days, depending on the need and travel time. During the spot checks, the implementation of protocols and the administration of the tools were assessed. The research associates had a checklist to assess the implementation of protocols and observed the data collectors individually as they administered the tools. The spot checks were also a means through which the research associates could understand the contexts in the regions, provinces, and cities that made their processes unique or similar in comparison with other areas. Feedback sessions with the data collection teams were done after each spot check to provide comments and recommendations about the data collection. These sessions were vital to relay the issues and comments observed by the research associates. The data collectors were also able to give comments and pose questions that they had about the protocols and tools. The data collection teams that needed more training to improve data quality were prioritized.

The WPR was the mechanism for updating MEASURE Evaluation and the SART team on the progress of data collection. It contained the number of interviews completed, a summary of the challenges encountered in the field, best practices and lessons from the data collection teams, action points for the data collectors, and data quality checks per tool. An important section of the WPR was the challenges encountered in the field. This allowed MEASURE Evaluation to make necessary changes to the tool(s), and to clarify the protocols for certain questions to ensure clean data. Such changes included adjusting the data limits and skip logic.

Data quality checks were also featured in the WPR. The data quality checks were coded in SurveyCTO to report high frequencies of "No Response" or "Don't Know" responses and outliers. SurveyCTO produced daily warnings about the data quality. To investigate these warnings, a research associate contacted the data collectors and documented the source of the issue. Some issues were due to the contexts of the health facilities, data collector entry errors, or values that exceeded limits. When necessary, changes were made to a tool, such as increasing the limits. The data quality checks were compiled weekly and reported in the WPR. Data in the SurveyCTO server were further cleaned for any inconsistencies.

APPENDIX B. TB OUTCOME DEFINITIONS

TB Outcome Definitions

Cured: A patient with bacteriologically confirmed TB at the beginning of treatment and who was smear- or culture-negative in the last month of treatment and on at least one previous occasion in the continuation phase.

Treatment completed: A patient who completes treatment without evidence of failure but with no record to show that sputum smear or culture results in the last month of treatment and on at least one previous occasion were negative, either because tests were not done or because results are unavailable.

This group includes:

- A bacteriologically confirmed patient who has completed treatment but without direct sputum smear microscopy follow-up in the last month of treatment and on at least one previous occasion.
- A clinically diagnosed patient who has completed treatment.

Treatment failed: A patient whose sputum smear or culture is positive at five months or later during treatment.
OR
A clinically diagnosed patient (child or extrapulmonary TB) for whom sputum examination cannot be done and who does not show clinical improvement anytime during treatment.

Died: A patient who dies for any reason during the course of treatment.

Lost to follow-up: A patient whose treatment was interrupted for two consecutive months or more.

Outcome not recorded: A patient for whom no treatment outcome is assigned in the register. This includes cases transferred to another DOTS facility and whose treatment outcome is unknown.

Source: Adapted from the WHO's *Definitions and Reporting Framework for Tuberculosis* (WHO, 2013)

APPENDIX C. ADDITIONAL TABLES

Table C1.1. Average number of TB patients seen at the facility each month (N=185)

	Average Patient Load	Min	Max
Facility Type			
Hospital	238	4	3000
Private Hospital	17	1	50
Health Center	33	1	1500
Other Than Public	28	2	90
Management Authority			
Government/Public	63	1	3000
Other Than Public	85	1	900
Facility Location			
Urban	82	1	3000
Rural	25	1	900
All Facilities	64	1	3000

Table C1.2. Patient TB characteristics, by TB diagnosis (N=539)

Patients Characteristics	Type of TB Diagnosed as Reported by the Patient					
	DS-TB and DR-TB	DS-TB and DR-TB	Extrapulmonary TB (EXPTB)	EXPTB	Total	Total
	No.	%	No.	%	No.	%
Patient Sex						
Male	251	58.4	58	53.2	309	57.3
Female	179	41.6	51	46.8	230	42.7
Patient Age						
15–19 Years	44	10.4	12	11.0	56	10.5
20–24 Years	86	20.3	13	11.9	99	18.6
25–34 Years	146	34.4	38	34.9	184	34.5
35–44 Years	78	18.4	22	20.2	100	18.8
45–54 Years	38	9.0	10	9.2	48	9.0
55–64 Years	17	4.0	8	7.3	25	4.7
65 Years and Above	15	3.5	6	5.5	21	3.9
Living Setting						
Urban	293	68.1	71	65.1	364	67.5
Rural	137	31.9	38	34.9	175	32.5
Patient Marital Status						
Never Married	136	31.6	32	29.4	168	31.2
Married or Cohabiting	242	56.3	66	60.6	308	57.1
Previously Married	52	12.1	11	10.1	63	11.7
Patient Employment Status						
Employed (part- or full-time)	71	16.5	12	11.0	83	15.4
Self-Employed	159	37.0	40	36.7	199	36.9
Unemployed	43	10.0	14	12.8	57	10.6
Student	48	11.2	13	11.9	61	11.3
Retired/Dependent	44	10.2	6	5.5	50	9.3
Housewife/Husband	65	15.1	24	22.0	89	16.5
Average Household Monthly Income of TB Patient						
0-600 Birr	93	21.6	20	18.3	113	21.0
601–1,650 Birr	125	29.1	26	23.9	151	28.0
1,651–3,200 Birr	108	25.1	20	18.3	128	23.7
3,201–5,250 Birr	34	7.9	13	11.9	47	8.7
5,251 Birr and Above	25	5.8	9	8.3	34	6.3
No Response	45	10.5	21	19.3	66	12.2

Patients Characteristics	Type of TB Diagnosed as Reported by the Patient					
	DS-TB and DR-TB	DS-TB and DR-TB	Extrapulmonary TB (EXPTB)	EXPTB	Total	Total
	No.	%	No.	%	No.	%
Type of Transportation Used Most Often to Get to the Facility						
Other Mobile Transport	40	9.3	9	8.3	49	9.1
Taxi/Auto-Rickshaw/Horse Cart	96	22.3	25	22.9	121	22.4
Walking	290	67.4	75	68.8	365	67.7
Other	4	0.9	0	0.0	4	0.7
Average Time to Travel or Get to Facility, in Minutes						
0–15 Minutes	190	44.2	50	45.9	240	44.5
16–30 Minutes	140	32.6	38	34.9	178	33.0
31–45 Minutes	10	2.3	6	5.5	16	3.0
46–60 Minutes	34	7.9	9	8.3	43	8.0
More Than 60 Minutes	56	13.0	6	5.5	62	11.5
Total	430	100.0	109	100.0	539	100.0

Structural Indicators

Table C2.1. Overall Availability of TB Services

	Facility Type								Facility Location				Total	
	Public Hospital		Private Hospital		Health Center		Other		Urban		Rural			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
TB Diagnosis Services (n=182)	29	100.0	5	100.0	141	97.2	6	100.0	127	99.2	54	94.7	181	97.8
Dispensing of drugs for TB treatment (n=182)	29	100.0	4	80.0	142	100.0	6	100.0	126	99.2	55	100.0	181	99.5
TB treatment and follow-up during the intensive phase (n=182)	28	96.6	5	100.0	141	99.3	5	83.3	125	98.4	54	98.2	179	98.4
TB treatment and follow-up during the continuation phase (n=182)	28	96.6	5	100.0	142	100.0	6	100.0	126	99.2	55	100.0	181	99.5
Facility-based directly observed treatment (DOT) (n=182)	29	100	4	80.0	141	99.3	5	83.3	125	98.4	54	98.2	179	98.4
Community-based DOT (HEW) (n=145)	4	44.4	99	73.3	--	--	1	100.0	64	69.6	40	75.5	104	71.7
Home-based treatment (self-managed without the support of family or treatment supporter) (n=179)	8	28.6	2	40.0	60	42.6	2	33.3	55	44.0	17	30.9	72	40.0
Home-based treatment (family or treatment supporters) (n=182)	15	51.7	3	60.0	119	83.8	4	66.7	97	76.4	44	80.0	141	77.5
Reminder phone calls or SMS texts to support patient adherence to treatment (n=182)	23	79.3	5	100.0	116	81.7	4	66.7	102	80.3	46	83.6	148	81.3

	Facility Type								Facility Location				Total	
	Public Hospital		Private Hospital		Health Center		Other		Urban		Rural			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Psychosocial or other adherence support (n=182)	23	79.3	4	80.0	94	66.2	3	50.0	90	70.9	34	61.8	124	68.1
Counseling with a psychologist or social worker (n=123)	8	34.8	1	25.0	16	17.2	1	33.3	22	24.7	4	11.8	26	21.1
One-on-one counseling by medical staff (n=124)	23	100.0	4	100.0	93	98.9	3	100.0	89	98.9	34	100.0	123	99.2
One-on-one peer counseling by lay counselor (n=124)	12	52.2	1	25.0	26	27.7	2	66.7	31	34.4	10	29.4	41	33.1
Nutritional support or food baskets (n=182)	16	55.2	0	0	46	32.4	2	33.3	48	37.8	16	29.1	64	35.2
Support group for TB patients (e.g., peer support, civic society) (n=182)	11	37.9	0	0	23	16.2	0	0	29	22.8	5	9.1	34	18.7
Patient tracking of those who miss an appointment (n=182)	28	96.6	5	100.0	141	99.3	4	66.7	123	96.9	55	100.0	178	97.8
Follow-up phone calls or SMS texts to TB patients if they miss an appointment (n=178)	27	96.4	5	100.0	135	95.7	4	100.0	121	98.4	50	90.9	171	96.1
Home visits to TB patients if they miss an appointment (n=177)	19	67.9	2	40.0	122	87.1	3	75.0	94	77.0	52	94.5	146	82.5

Table C2.2. Availability of diagnosis services for facilities with both onsite and offsite laboratories (n=181)

	Facility Type								Facility Location				Total	
	Public Hospital		Private Hospital		Health Center		Other		Urban		Rural			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Diagnosis by clinical signs and symptoms	29	100.0	5	100.0	121	85.8	6	100.0	120	94.5	41	75.9	161	89.0
Diagnosis by x-ray	29	100.0	5	100.0	68	48.2	5	83.3	85	66.9	22	40.7	107	59.1
Diagnosis by smear microscopy	27	93.1	5	100.0	135	95.7	6	100.0	124	97.6	49	90.7	173	95.6
Diagnosis by GeneXpert	28	96.6	4	80.0	90	63.8	5	83.3	103	81.1	24	44.4	127	70.2
Diagnosis by fine needle aspiration	13	44.8	4	80.0	19	13.5	3	50.0	32	25.2	7	13.0	39	21.5
Diagnosis by biopsy	13	44.8	4	80.0	5	3.5	2	33.3	22	17.3	2	3.7	24	13.3
Diagnosis by cytology	10	34.5	3	60.0	2	1.4	1	16.7	15	11.8	1	1.9	16	8.8

Table C2.3. Availability of onsite and offsite laboratory services (n=181)

	Facility Type								Facility Location				Total	
	Public Hospital (n=29)		Private Hospital (n=5)		Health Center (n=141)		Other (n=6)		Urban (n=127)		Rural (n=54)			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Availability of TB diagnosis services via an onsite or offsite laboratory														
Yes, onsite lab only	4	13.8	1	20.0	26	18.4	0	0.0	17	13.4	14	25.9	31	17.1
Yes, offsite lab only	0	0.0	0	0.0	12	8.5	0	0.0	5	3.9	7	13.0	12	6.6
Yes, both onsite and offsite labs	25	86.2	4	80.0	101	71.6	6	100.0	103	81.1	33	61.1	136	75.1
No lab diagnosis	0	0.0	0	0.0	2	1.4	0	0.0	2	1.6	0	0.0	2	1.1
Facility requests sputum sample from new presumptive TB patients														
Yes	29	100.0	5	100.0	133	94.3	6	100.0	124	97.6	49	90.7	173	95.6
No	0	0.0	0	0.0	8	5.7	0	0.0	3	2.4	5	9.3	8	4.4

Table C2.4. Availability of treatment and initiation services, by facility type and location

	Facility Type								Facility Location				Total	
	Public Hospital		Private Hospital		Health Center		Other		Urban		Rural			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Availability of initiation and treatment services for DS-TB (N=185)														
Yes, initiate DS-TB treatment only	0	0.0	0	0.0	1	0.7	1	16.7	2	1.6	0	0.0	2	1.1
Yes, manage DS-TB patients on treatment only	0	0.0	0	0.0	4	2.8	0	0.0	1	0.8	3	5.3	4	2.2
Both initiate and manage DS-TB treatment	28	96.6	5	100.0	140	96.6	5	83.3	124	96.9	54	94.7	178	96.2
No	1	3.4	0	0.0	0	0.0	0	0.0	1	0.8	0	0.0	1	0.5
Availability of initiation and treatment services for DR-TB (n=58)														
Yes, manages treatment only	11	47.8	0	0.0	35	100.0	0	0.0	37	75.5	9	100.0	46	79.3
Yes, both initiates and manages treatment	12	52.2	0	0.0	0	0.0	0	0.0	12	24.5	0	0.0	12	20.7
Facility provides TB treatment services to children (n=184)														
Yes, initiates treatment only	2	7.1	0	0.0	1	0.7	1	16.7	4	3.1	0	0.0	4	2.2
Yes, manages treatment only	1	3.6	0	0.0	21	14.5	1	16.7	10	7.9	13	22.8	23	12.5
Yes, both initiates and manages treatment	24	85.7	3	60.0	103	71.0	4	66.7	100.0	78.7	34	59.6	134	72.8
No	1	3.6	2	40.0	20	13.8	0	0.0	13	10.2	10	17.5	23	12.5

Table C2.5. Availability of the DR-TB regimen (n=12)

	Facility Type								Facility Location				Total (n=12)	
	Public Hospital (n=12)		Private Hospital (n=0)		Health Center (n=0)		Other (n=0)		Urban (n=12)		Rural (n=0)			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Availability of the RR/DR-TB regimen														
Short standard treatment regimen (9 to 12-month), (4-6 Am-Mfx-Pto-Cfz-Z-HH-E/5 Mfx-Cfz-Z-E)	12	100.0	--	--	--	--	--	--	12	100.0	--	--	12	100.0
Individualized longer regimen (20-month), (20 Bdq-Mfx-Lzd-Cfz-Cs- Dlm-Pto-Z)	9	75.0	--	--	--	--	--	--	9	75.0	--	--	9	75.0
Short standard treatment regimen (9 to 12-month), (4-6 Km-Mfx-Pto-Cfz-Z-HH-E/5 Mfx-Cfz-Z-E)	11	91.7	--	--	--	--	--	--	11	91.7	--	--	11	91.7
Longer standardized regimen (20 Bdq-Mfx-Lzd-Cfz)	11	91.7	--	--	--	--	--	--	11	91.7	--	--	11	91.7
Most used RR/MDR-TB treatment regimen														
Short standard treatment regimen (9 to 12-month), (4-6 Am-Mfx-Pto-Cfz-Z-HH-E/5 Mfx-Cfz-Z-E)	8	66.7	--	--	--	--	--	--	8	66.7	--	--	8	66.7
Short standard treatment regimen (9 to 12-month), (4-6 Km-Mfx-Pto-Cfz-Z-HH-E/5 Mfx-Cfz-Z-E)	2	16.7	--	--	--	--	--	--	2	16.7	--	--	2	16.7
Longer standardized regimen (20 Bdq-Mfx-Lzd-Cfz)	2	16.7	--	--	--	--	--	--	2	16.7	--	--	2	16.7

Table C2.6. Pediatric treatment options provided, by facility type and location

	Facility Type								Facility Location				Total	
	Public Hospital		Private Hospital		Health Center		Other		Urban		Rural			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Facility uses FDCs for treatment of children with TB (n=161)	25	92.6	2	66.7	119	95.2	5	83.3	107	93.9	44	93.6	151	93.8
FDCs available in dispersible form (n=151)	25	100.0	1	50.0	95	79.8	1	20.0	91	85.0	31	70.5	122	80.8
Facility uses loose or single drug formulations for children (n=161)	22	81.5	1	33.3	84	67.2	2	33.3	78	68.4	31	66.0	109	67.7
Loose drugs used for children (n=109)														
Isoniazid 100 mg, dispersible tablet	14	63.6	1	100.0	50	59.5	0	0.0	46	59.0	19	61.3	65	59.6
Ethambutol 100 mg, film coated tablet	22	100.0	1	100.0	76	90.5	1	50.0	73	93.6	27	87.1	100	91.7
Facility uses loose pills that could be cut up or mixed with food	7	31.8	0	0.0	22	26.2	0	0.0	18	23.1	11	35.5	29	26.6
Facility uses the same medications used for adults but cut up for children (n=161)	11	40.7	1	33.3	38	30.4	2	33.3	33	28.9	19	40.4	52	32.3
How dosage is determined for children (n=161)														
Fixed in the kit	6	22.2	1	33.3	16	12.8	2	33.3	20	17.5	5	10.6	25	15.5
Weight-based	27	100.0	3	100.0	118	94.4	5	83.3	111	97.4	42	89.4	153	95.0
Age-based	5	18.5	1	33.3	26	20.8	1	16.7	25	21.9	8	17.0	33	20.5

Table C2.7. Availability of HIV services, by facility type and location

	Facility Type								Facility Location				Total	
	Public Hospital		Private Hospital		Health Center		Other		Urban		Rural			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
HIV services offered														
HIV testing and counseling for presumptive TB patients (n=184)	28	96.6	4	80.0	134	93.1	6	100.0	121	94.5	51	91.1	172	93.5
HIV testing and counseling for confirmed TB patients (n=184)	29	100.0	5	100.0	140	97.2	6	100.0	127	99.2	53	94.6	180	97.8
TPT for HIV- positive adults (n=128)	26	92.9	5	100.0	76	81.7	2	100.0	97	91.5	12	54.5	109	85.2
TPT for children under 5 years (n=184)	29	100.0	2	40.0	97	67.4	2	33.3	105	82.0	25	44.6	130	70.7
TPT for children 5–15 years (n=184)	18	62.1	2	40.0	62	43.1	2	33.3	68	53.1	16	28.6	84	45.7
Type of TPT available (n=141)														
Isoniazid (6 months)	28	96.6	5	100.0	103	99.0	3	100.0	114	99.1	25	96.2	139	98.6
3HP (12 weeks of rifapentine and isoniazid)	2	6.9	0	0.0	2	1.9	0	0.0	4	3.5	0	0.0	4	2.8
3RH	8	27.6	1	20.0	9	8.7	0	0.0	15	13.0	3	11.5	18	12.8
TPT available through a differentiated service delivery model	4	13.8	0	0.0	21	20.2	0	0.0	18	15.7	7	26.9	25	17.7

Table C2.8. Other HIV/TB services offered, by facility type and location

	Facility Type								Facility Location				Total	
	Public Hospital		Private Hospital		Health Center		Other		Urban		Rural			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
HIV care and treatment services provided to TB/HIV coinfected patients (n=128)														
CPT for TB/HIV coinfected patients	28	100.0	5	100.0	82	88.2	2	100.0	103	97.2	14	63.6	117	91.4
Viral load testing for TB/HIV coinfected patients	27	96.4	4	80.0	63	67.7	2	100.0	87	82.1	9	40.9	96	75.0
ART for TB/HIV coinfected patients	28	100.0	5	100.0	76	81.7	2	100.0	100	94.3	11	50.0	111	86.7
Information provided to TB/HIV coinfected patients on ART (n=184)														
What to do if the patient experiences anti-TB and antiretroviral drug interactions	28	96.6	4	80.0	98	68.0	5	83.3	111	86.8	24	42.9	135	73.4
What to do if signs and symptoms of immune reconstitution inflammatory syndrome become evident	26	89.7	4	80.0	91	63.2	5	83.4	103	80.5	23	41.1	126	68.5

Table C2.9. General services provided by HEWs, as specified by the health facility (n=145)

	Facility Type								Facility Location				Total (n=145)	
	Public Hospital (n=8)		Private Hospital (n=0)		Health Center (n=136)		Other (n=1)		Urban (n=90)		Rural (n=55)			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Education about TB in the community	7	87.5	--	--	130	95.6	1	100.0	85	94.4	53	96.4	138	95.2
Screening for TB symptoms	6	75.0	--	--	129	94.9	1	100.0	84	93.3	52	94.5	136	93.8
Referral of symptomatic cases for TB diagnosis	6	75.0	--	--	129	94.9	1	100.0	84	93.3	52	94.5	136	93.8
Collection and delivery of specimens to a health center	0	0.0	--	--	7	5.1	0	0.0	5	5.6	2	3.6	7	4.8
Adherence counseling	6	75.0	--	--	123	90.4	1	100.0	82	91.1	48	87.3	130	89.7
Trace or locate patients who miss follow-up visits	7	87.5	--	--	133	97.8	1	100.0	89	98.9	52	94.5	141	97.2
Contact tracing for confirmed TB patients	6	75.0	--	--	123	90.4	1	100.0	82	91.1	48	87.3	130	89.7
Slide fixing for referral	1	12.5	--	--	4	2.9	0	0.0	4	4.4	1	1.8	5	3.4
Psychosocial support	3	37.5	--	--	83	61.0	1	100.0	56	62.2	31	56.4	87	60.0
HIV testing and counseling	2	25.0	--	--	37	27.2	0	0.0	29	32.2	10	18.2	39	26.9

Table C2.10. Average turnaround time for onsite laboratories, by facility type and location

	Facility Type								Facility Location				Total	
	Public Hospital		Private Hospital		Health Center		Other		Urban		Rural			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Average number of days to receive smear microscopy results (n=165)														
1 day	25	92.6	4	80.0	117	92.1	5	83.3	111	93.3	40	87.0	151	91.5
2 days	1	3.7	0	0.0	6	4.7	0	0.0	4	3.4	3	6.5	7	4.2
3–7 days	1	3.7	1	20.0	2	1.6	1	16.7	4	3.4	1	2.2	5	3.0
Don't know	0	0.0	0	0.0	2	1.6	0	0.0	0	0.0	2	4.3	2	1.2
Total	27	100.0	5	100.0	127	100.0	6	100.0	119	100.0	46	100.0	165	100.0
Average number of days to receive GeneXpert results (n=33)														
1 day	23	92.0	--	--	7	87.5	--	--	30	90.9	--	--	30	90.9
3–7 days	2	8.0	--	--	1	12.5	--	--	3	9.1	--	--	3	9.1
Total	25	100.0	--	--	8	100.0	--	--	33	100.0	--	--	33	100.0

Table C2.11. Average turnaround time for offsite laboratories, by facility type and location

	Facility Type								Facility Location				Total	
	Public Hospital		Private Hospital		Health Center		Other		Urban		Rural			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Average number of days to receive smear microscopy results (n=30)														
1 day	4	66.7	1	100.0	8	36.4	1	100.0	12	57.1	2	22.2	14	46.7
2 days	0	0.0	0	0.0	7	31.8	0	0.0	3	14.3	4	44.4	7	23.3
3–7 days	0	0.0	0	0.0	3	13.6	0	0.0	0	0.0	3	33.3	3	10.0
>7 days	0	0.0	0	0.0	2	9.1	0	0.0	2	9.5	0	0.0	2	6.7
Don't know	2	33.3	0	0.0	2	9.1	0	0.0	4	19.0	0	0.0	4	13.3
Total	6	100.0	1	100.0	22	100.0	1	100.0	21	100.0	9	100.0	30	100.0
Average number of days to receive GeneXpert results (n=108)														
1 day	5	41.7	0	0.0	13	14.8	0	0.0	18	22.2	0	0.0	18	16.7
2 days	0	0.0	0	0.0	24	27.3	1	25.0	15	18.5	10	37.0	25	23.1
3–7 days	3	25.0	2	50.0	32	36.4	1	25.0	30	37.0	8	29.6	38	35.2
>7 days	2	16.7	2	50.0	11	12.5	1	25.0	12	14.8	4	14.8	16	14.8
Don't know	2	16.7	0	0.0	8	9.1	1	25.0	6	7.4	5	18.5	11	10.2
Total	12	100.0	4	100.0	88	100.0	4	100.0	81	100.0	27	100.0	108	100.0
Average number of days to receive culture results (n=11)														
1–2 months	6	60.0	--	--	1	100.0	--	--	7	63.6	--	--	7	63.6
3–5 months	4	40.0	--	--	0	0.0	--	--	4	36.4	--	--	4	36.4
Total	10	100.0	--	--	1	100.0	--	--	11	100.0	--	--	11	100.0
Average number of days to receive first-line LPA results (n=11)														
>7 days	10	90.9	--	--	--	--	--	--	10	90.9	--	--	10	90.9

	Facility Type								Facility Location				Total	
	Public Hospital		Private Hospital		Health Center		Other		Urban		Rural			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Don't know	1	9.1	--	--	--	--	--	--	1	9.1	--	--	1	9.1
Total	11	100.0	--	--	--	--	--	--	11	100.0	--	--	11	100.0
Average number of days to receive second-line LPA results (n=10)														
3–7 days	0	0.0	--	--	1	100.0	--	--	1	10.0	--	--	1	10.0
>7 days	9	100.0	--	--	0	0.0	--	--	9	90.0	--	--	9	90.0
Total	9	100.0	--	--	1	100.0	--	--	10	100.0	--	--	10	100.0

Table C2.12. Availability of DST services, by facility type and location for facilities with ONSITE laboratories

	Facility Type								Facility Location				Total	
	Public Hospital		Private Hospital		Health Center		Other		Urban		Rural			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Availability of first-line DST in the past 12 months (n=167)														
Yes	24	82.8	2	40.0	43	33.9	2	33.3	62	51.7	9	19.1	71	42.5
No	5	17.2	3	60.0	82	64.6	4	66.7	58	48.3	36	76.6	94	56.3
Don't know	0	0.0	0	0.0	2	1.6	0	0.0	0	0.0	2	4.3	2	1.2
Total	29	100.0	5	100.0	127	100.0	6	100.0	120	100.0	47	100.0	167	100.0
Methods for first-line DST (n=71)														
GeneXpert	24	100.0	2	100.0	43	100.0	2	100.0	62	100.0	9	100.0	71	100.0
First-line LPAs (e.g., MTBDRplus)	1	4.2	0	0.0	0	0.0	0	0.0	1	1.6	0	0.0	1	1.4
Solid Culture	1	4.2	0	0.0	0	0.0	0	0.0	1	1.6	0	0.0	1	1.4
Liquid Culture	1	4.2	0	0.0	0	0.0	0	0.0	1	1.6	0	0.0	1	1.4
Total	24	100.0	2	100.0	43	100.0	2	100.0	62	100.0	9	100.0	71	100.0
Availability of second-line DST in the past 12 months (n=12)														
Yes	1	8.3	0	0.0	--	--	--	--	1	7.7	--	--	1	7.7
No	11	91.7	1	100.0	--	--	--	--	12	92.3	--	--	12	92.3
Total	12	100.0	1	100.0	--	--	--	--	13	100.0	--	--	13	100.0
Facilities that referred patients to another facility for DR-TB diagnosis, (e.g., DST in the past 12 months) (n=88)	5	55.6	0	0.0	20	26.7	2	66.7	22	40.7	5	13.9	27	30.0

Table C2.13. Specimen management, by facility type and location (N=185)

	Facility Type								Facility Location				Total (N=185)	
	Public Hospital (n=29)		Private Hospital (n=5)		Health Center (n=145)		Other (n=6)		Urban (n=128)		Rural (n=57)			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Providers correctly described when sputum should be collected from a patient	29	100.0	5	100.0	132	91.0	6	100.0	123	96.1	49	86.0	172	93.0
Standard operating procedures for specimen collection observed	26	89.7	5	100.0	109	75.2	4	66.7	110	85.9	34	59.6	144	77.8
Laboratory request forms observed	29	100.0	5	100.0	118	81.4	5	83.3	117	91.4	40	70.2	157	84.9
Experienced any stockouts of specimen management supplies	15	51.7	2	40.0	46	31.7	1	16.7	49	38.3	15	26.3	64	34.6

Table C2.14. Availability of laboratory equipment on the day of the assessment

	Public Hospital		Private Hospital		Health Center		Other		Urban		Rural		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Carbolfuscin stain available (n=127)	18	94.7	5	100.0	92	93.9	4	80.0	81	92.0	38	97.4	119	93.7
Sulfuric acid available (n=127)	15	78.9	3	60.0	86	87.8	4	80.0	72	81.8	36	92.3	108	85.0
Methyl blue stain available (n=127)	18	94.7	5	100.0	93	94.9	4	80.0	81	92.0	39	100.0	120	94.5
Functional fluorescence microscope (FM) available (n=163)	24	85.7	2	40.0	52	41.9	1	16.7	66	56.4	13	28.3	79	48.5
Auramine stain available (n=80)	22	91.7	1	50.0	37	69.8	1	100.0	52	77.6	9	69.2	61	76.3
GeneXpert module available (n=33)	24	96.0	--	--	8	100.0	--	--	32	97.0	--	--	32	97.0
Xpert MTB/RIF cartridge available (n=33)	22	88.0	--	--	7	87.5	--	--	29	87.9	--	--	29	87.9
Culture or growth medium available (n=11)	1	16.7	0	0.0	0	0.0	--	--	1	9.1	--	--	1	9.1
Functional biosafety hood (n=167)	6	20.7	2	40.0	11	8.7	0	0.0	17	14.2	2	4.3	19	11.4

Table C2.15. Type of quality control used by facilities, according to facility type and location

	Facility Type								Facility Location					
	Public Hospital		Private Hospital		Health Center		Other		Urban		Rural		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
QA/QC used for smear microscopy (n=162)														
Internal QA/QC only	4	14.8	0	0.0	15	12.1	0	0.0	13	11.2	6	13.0	19	11.7
External QA/QC only	1	3.7	1	20.0	15	12.1	1	16.7	9	7.8	9	19.6	18	11.1
Both internal and external QA/QC	22	81.5	4	80.0	83	66.9	5	83.3	88	75.9	26	56.5	114	70.4
Don't know	0	0.0	0	0.0	2	1.6	0	0.0	1	0.9	1	2.2	2	1.2
None	0	0.0	0	0.0	9	7.3	0	0.0	5	4.3	4	8.7	9	5.6
Total	27	100.0	5	100.0	124	100.0	6	100.0	116	100.0	46	100.0	162	100.0
Records maintained for smear microscopy QA/QC results (n=151)	26	96.3	5	100.0	98	86.7	6	100.0	103	93.6	32	78.0	135	89.4
Have guidelines for QA/QC for smear microscopy (n=151)	26	96.3	5	100.0	94	83.2	6	100.0	100	90.9	31	75.6	131	86.8
QA/QC used for GeneXpert (n=32)														
Internal QA/QC only	4	16.7	--	--	0	0	--	--	4	12.5	--	--	4	12.5
External QA/QC only	5	20.8	--	--	1	12.5	--	--	6	18.8	--	--	6	18.8
Both internal and external QA/QC	12	50.0	--	--	6	75	--	--	18	56.3	--	--	18	56.3
None	3	12.5	--	--	1	12.5	--	--	4	12.5	--	--	4	12.5
Total	24	100.0	--	--	8	100.0	--	--	32	100.0	--	--	32	100.0
Records maintained for GeneXpert QA/QC results	21	100.0	--	--	7	100.0	--	--	28	100.0	--	--	28	100.0
Have guidelines for QA/QC for GeneXpert	21	100.0	--	--	7	100.0	--	--	28	100.0	--	--	28	100.0

	Facility Type								Facility Location					
	Public Hospital		Private Hospital		Health Center		Other		Urban		Rural		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
QA/QC used for liquid culture (n=1)														
Both internal and external QA/QC	1	100.0	--	--	--	--	--	--	1	100.0	--	--	1	100.0
Total	1	100.0	--	--	--	--	--	--	1	100.0	--	--	1	100.0
Records maintained for liquid culture QA/QC results	1	100.0	--	--	--	--	--	--	1	100.0	--	--	1	100.0
Have guidelines for QA/QC for liquid culture	1	100.0	--	--	--	--	--	--	1	100.0	--	--	1	100.0
QA/QC used for solid culture (n=1)														
Both internal and external QA/QC	1	100.0	--	--	--	--	--	--	1	100.0	--	--	1	100.0
Total	1	100.0	--	--	--	--	--	--	1	100.0	--	--	1	100.0
Records maintained for solid culture QA/QC results	1	100.0	--	--	--	--	--	--	1	100.0	--	--	1	100.0
Have guidelines for QA/QC for solid culture	1	100.0	--	--	--	--	--	--	1	100.0	--	--	1	100.0
QA/QC used for LPA (n=1)														
Both internal and external QA/QC	1	100.0	--	--	--	--	--	--	1	100.0	--	--	1	100.0
Total	1	100.0	--	--	--	--	--	--	1	100.0	--	--	1	100.0
Records maintained for LPA QA/QC results	1	100.0	--	--	--	--	--	--	1	100.0	--	--	1	100.0
Have guidelines for QA/QC for LPA	1	100.0	--	--	--	--	--	--	1	100.0	--	--	1	100.0

Table C2.16. Functional basic medical equipment observed at the facility on the day of the assessment, by facility type and location (N=185)

	Facility Type								Facility Location				Total (N=185)	
	Public Hospital (n=29)		Private Hospital (n=5)		Health Center (n=145)		Other (n=6)		Urban (n=128)		Rural (n=57)			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Adult weighing scale	29	100.0	5	100.0	139	95.9	6	100.0	126	98.4	53	93.0	179	96.8
Child weighing scale	22	75.9	4	80.0	95	65.5	1	16.7	89	69.5	33	57.9	122	65.9
Infant weighing scale	24	82.8	4	80.0	116	80.0	1	16.7	105	82.0	40	70.2	145	78.4
Height board or standometer	28	96.6	5	100.0	124	85.5	4	66.7	116	90.6	45	78.9	161	87.0
Sphygmomanometer	29	100.0	5	100.0	138	95.2	6	100.0	125	97.7	53	93.0	178	96.2
Thermometer	28	96.6	5	100.0	140	96.6	6	100.0	126	98.4	53	93.0	179	96.8
Stethoscope	29	100.0	5	100.0	144	99.3	6	100.0	127	99.2	57	100.0	184	99.5
Light source	22	75.9	4	80.0	68	46.9	4	66.7	74	57.8	24	42.1	98	53.0
IV Kit	22	75.9	5	100.0	105	72.4	5	83.3	97	75.8	40	70.2	137	74.1
Oxygen concentrator	26	89.7	4	80.0	38	26.2	1	16.7	57	44.5	12	21.1	69	37.3
Oxygen cylinder	29	100.0	5	100.0	43	29.7	2	33.3	67	52.3	12	21.1	79	42.7
Central oxygen supply	4	13.8	2	40.0	9	6.2	1	16.7	14	10.9	2	3.5	16	8.6
Flowmeter for oxygen therapy	23	79.3	5	100.0	34	23.4	2	33.3	56	43.8	8	14.0	64	34.6
Oxygen delivery apparatus	25	86.2	5	100.0	42	29.0	2	33.3	65	50.8	9	15.8	74	40.0
Pulse oximeter	28	96.6	5	100.0	34	23.4	3	50.0	62	48.4	8	14.0	70	37.8

Table C2.17. Availability of first-line TB treatment drugs at treatment facilities on day of assessment, by facility type and location (N=185)

	Facility Type								Facility Location				Total (N=185)	
	Public Hospital (n=29)		Private Hospital (n=5)		Health Center (n=145)		Other (n=6)		Urban (n=128)		Rural (n=57)			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Rifampicin/Isoniazid/Pyrazinamide/ Ethambutol 150/75/400/275, film coated	29	100.0	5	100.0	133	91.7	6	100.0	122	95.3	51	89.5	173	94.0
Rifampicin/Isoniazid 150/75, film coated tablet	27	93.1	5	100.0	120	82.8	5	83.3	106	82.8	51	89.5	157	85.0
Ethambutol 100 mg, film coated tablet	25	86.2	3	60.0	120	82.8	1	16.7	106	82.8	43	75.4	149	81.0
Rifampicin/Isoniazid, 75/50 mg, dispersible tablet	25	86.2	2	40.0	113	77.9	0	0.0	103	80.5	37	64.9	140	76.0
Rifampicin/Isoniazid/Pyrazinamide, 75/50/150 mg, dispersible tablet	23	79.3	3	60.0	95	65.5	0	0.0	85	66.4	36	63.2	121	65.0
Isoniazid 300 mg tablet	28	96.6	3	60.0	122	84.1	2	33.3	112	87.5	43	75.4	155	84.0
Any dosage of Pyridoxine	28	96.6	2	40.0	124	85.5	2	33.3	111	86.7	45	78.9	156	84.0
Isoniazid 100 mg, dispersible tablet	9	31.0	0	0.0	42	29.0	0	0.0	39	30.5	12	21.1	51	28.0
Isoniazid 100 mg, film uncoated tablet	22	75.9	2	40.0	103	71	1	16.7	88	68.8	40	70.2	128	69.0

Table C2.18. Availability of DR-TB drugs at DR-TB initiation sites only, by facility type and location (n=12)

	Facility Type								Facility Location				Total (n=12)	
	Public Hospital (n=12)		Private Hospital		Health Center		Other		Urban (n=12)		Rural			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Amikacin 500 mg/2 ml solution for injection	10	83.3	--	--	--	--	--	--	10	83.3	--	--	10	83.3
Bedaquiline 100mg tablet	11	91.7	--	--	--	--	--	--	11	91.7	--	--	11	91.7
Capreomycin 1000 mg powder for injection	11	91.7	--	--	--	--	--	--	11	91.7	--	--	11	91.7
Clofazimine 100 mg capsule	12	100.0	--	--	--	--	--	--	12	100.0	--	--	12	100.0
Cycloserine 250 mg capsule	12	100.0	--	--	--	--	--	--	12	100.0	--	--	12	100.0
Delamanid 50 mg tablet	7	58.3	--	--	--	--	--	--	7	58.3	--	--	7	58.3
Kanamycin 1000 mg/4 ml solution for injection	7	58.3	--	--	--	--	--	--	7	58.3	--	--	7	58.3
Levofloxacin 250 mg tablet	12	100.0	--	--	--	--	--	--	12	100.0	--	--	12	100.0
Linezolid 600 mg tablet	10	83.3	--	--	--	--	--	--	10	83.3	--	--	10	83.3
Moxifloxacin 400 mg tablet	12	100.0	--	--	--	--	--	--	12	100.0	--	--	12	100.0
Paraaminosalycilic acid 4g sachet	6	50.0	--	--	--	--	--	--	6	50.0	--	--	6	50.0
Protionamide 250 mg tablet	12	100.0	--	--	--	--	--	--	12	100.0	--	--	12	100.0
Pyrazinamide 400 mg tablet	12	100.0	--	--	--	--	--	--	12	100.0	--	--	12	100.0
Levofloxacin 100 mg dispersible tablet	4	33.3	--	--	--	--	--	--	4	33.3	--	--	4	33.3
Cyclocerine 125 mg capsule	3	25.0	--	--	--	--	--	--	3	25.0	--	--	3	25.0
Moxifloxacin 100 mg dispersible tablet	2	16.7	--	--	--	--	--	--	2	16.7	--	--	2	16.7
Amoxicillin + Clavulanic acid 500mg+125mg tablet	8	66.7	--	--	--	--	--	--	8	66.7	--	--	8	66.7
Ethambutol 400 mg tablet	11	91.7	--	--	--	--	--	--	11	91.7	--	--	11	91.7

Table C2.19. Storage conditions at facilities keeping commodities/supplies per NTLP guidelines, by facility type and location (N=185)

	Facility Type								Facility Location				Total (N=185)	
	Public Hospital		Private Hospital		Health Center		Other		Urban		Rural			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Room/store is clean and dust-free	26	89.7	5	100.0	110	75.9	4	66.7	110	85.9	35	61.4	145	78.4
Supplies and commodities are stored to prevent water damage	23	79.3	4	80.0	94	64.8	4	66.7	95	74.2	30	52.6	125	67.6
Room/store is adequately ventilated	24	82.8	4	80.0	103	71.0	3	50.0	94	73.4	40	70.2	134	72.4
Room/store is properly lit	23	79.3	5	100.0	119	82.1	5	83.3	105	82.0	47	82.5	152	82.2
Supplies and commodities are stored away from direct sunlight	27	93.1	5	100.0	117	80.7	5	83.3	113	88.3	41	71.9	154	83.2
Supplies and commodities are stored without direct contact with walls or floor	25	86.2	4	80.0	101	69.7	4	66.7	99	77.3	35	61.4	134	72.4
Usable supplies and commodities are separated from expired and damaged ones	25	89.3	5	100.0	113	79.0	5	83.3	108	85.7	40	71.4	148	81.3
Room/store has a functional thermometer	19	65.5	3	60.0	38	26.2	1	16.7	52	40.6	9	15.8	61	33.0
Room/store has proper temperature (30°C or less) (n=61)	19	100.0	3	100.0	37	97.4	1	100.0	51	98.1	9	100.0	60	98.4

Table C2.20. Infection prevention and control practices reported by the facility, by facility type and location (N=185)

	Facility Type								Facility Location				Total (N=185)	
	Public Hospital (n=29)		Private Hospital (n=5)		Health Center (n=145)		Other (n=6)		Urban (n=128)		Rural (n=57)			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Staff member designated as IPC focal person	27	93.1	5	100.0	109	75.2	1	16.7	103	80.5	39	68.4	142	76.8
Patients routinely asked about cough when entering the facility	27	93.1	4	80.0	124	85.5	6	100.0	115	89.8	46	80.7	161	87.0
Cough triage implemented at facility	23	79.3	4	80.0	94	64.8	4	66.7	95	74.2	30	52.6	125	67.6
Separate waiting area to isolate potentially infectious people	20	69.0	3	60.0	61	42.1	2	33.3	68	53.1	18	31.6	86	46.5
Cough monitor or other designated person assists with separation/triage of coughing patients	21	72.4	2	40.0	71	49.0	2	33.3	76	59.4	20	35.1	96	51.9
Surgical masks available for presumptive and confirmed DS-/DR-TB patients	25	86.2	4	80.0	70	48.3	4	66.7	77	60.2	26	45.6	103	55.7
System in place to screen and evaluate staff for TB disease	15	51.7	1	20.0	53	36.6	0	0.0	52	40.6	17	29.8	69	37.3

Table C2.21. IPC resources observed, by facility type and location (N=185)

	Facility Type								Facility Location				Total (N=185)	
	Public Hospital (n=29)		Private Hospital (n=5)		Health Center (n=145)		Other (n=6)		Urban (n=128)		Rural (n=57)			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Updated and approved IPC plan available	18	62.1	3	60.0	64	44.1	1	16.7	64	50.0	22	38.6	86	46.5
Updated annual TB IPC risk assessment result	17	58.6	3	60.0	50	34.5	0	0.0	51	39.8	19	33.3	70	37.8
Supplies for coughing patients (e.g., tissues, surgical masks) available	24	82.8	4	80.0	58	40.0	3	50.0	73	57.0	16	28.1	89	48.1
Confidential log for all staff with presumptive or confirmed TB observed	5	17.2	1	20.0	12	8.3	1	16.7	19	14.8	0	0.0	19	10.3
Patient waiting areas are either outdoors or indoors with access to continuous fresh air	24	82.8	3	60.0	109	75.2	2	33.3	100	78.1	38	66.7	138	74.6

Table C2.22. Infection prevention and control equipment/infrastructure observed, by facility type and location (N=185)

	Facility Type								Facility Location				Total (N=185)	
	Public Hospital (n=29)		Private Hospital (n=5)		Health Center (n=145)		Other (n=6)		Urban (n=128))		Rural (n=57)			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Running water (piped, bucket with tap, or pour pitcher)	27	93.1	5	100.0	113	77.9	6	100.0	119	93.0	32	56.1	151	81.6
Hand washing soap (may be liquid soap)	26	89.7	4	80.0	100	69.0	6	100.0	109	85.2	27	47.4	136	73.5
Alcohol-based hand rub	27	93.1	5	100.0	123	84.8	6	100.0	118	92.2	43	75.4	161	87.0
Medical waste receptacle (pedal bin) with lid and plastic bin liners	26	89.7	4	80.0	98	67.6	6	100.0	101	78.9	33	57.9	134	72.4
Other waste receptacle	26	89.7	4	80.0	133	91.7	6	100.0	120	93.8	49	86.0	169	91.4
Sharps container (i.e., safety box)	28	96.6	5	100.0	139	95.9	6	100.0	126	98.4	52	91.2	178	96.2
Disposable latex gloves	27	93.1	5	100.0	136	93.8	6	100.0	123	96.1	51	89.5	174	94.1
Disinfectant (e.g., chlorine, alcohol)	29	100.0	5	100.0	131	90.3	6	100.0	125	97.7	46	80.7	171	92.4
Single use standard disposable syringes with needles or auto-disable syringes with needles	23	79.3	5	100.0	113	77.9	6	100.0	105	82.0	42	73.7	147	79.5
Gowns	29	100.0	5	100.0	132	91.0	6	100.0	121	94.5	51	89.5	172	93.0
Eye protection/goggles or face protection	21	72.4	4	80.0	54	37.2	2	33.3	65	50.8	16	28.1	81	43.8
Injection safety precaution guidelines for standard precautions	24	82.8	3	60.0	68	46.9	4	66.7	75	58.6	24	42.1	99	53.5
Needles destroyer	16	55.2	4	80.0	77	53.1	3	50.0	76	59.4	24	42.1	100	54.1
Methylated spirit and glycerin 70:30	18	62.1	4	80.0	70	48.3	4	66.7	71	55.5	25	43.9	96	51.9

Table C2.23. Specimen collection procedures, by facility type and location (N=185)

	Facility Type								Facility Location				Total (N=185)	
	Public Hospital (n=29)		Private Hospital (n=5)		Health Center (n=145)		Other (n=6)		Urban (n=128)		Rural (n=57)			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Specimens collected in the following areas:														
Outside the screening and treatment area	23	79.3	4	80.0	95	65.5	5	83.3	100	78.1	27	47.4	127	68.6
Away from other patients	22	75.9	3	60.0	93	64.1	3	50.0	95	74.2	26	45.6	121	65.4
In a separate room	21	72.4	2	40.0	63	43.4	2	33.3	73	57.0	15	26.3	88	47.6
In a well-ventilated area, (e.g., open air or with open windows)	26	89.7	3	60.0	107	73.8	3	50.0	104	81.3	35	61.4	139	75.1

Table C2.24. Availability and use of respirators, by facility type and location

	Facility Type								Facility Location				Total	
	Public Hospital		Private Hospital		Health Center		Other		Urban		Rural			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N-95 respirators readily available to staff (N=185)	18	62.1	2	40.0	47	32.4	2	33.3	56	43.8	13	22.8	69	37.3
Staff have been trained on the proper fit of the respirators (n=79)	20	90.9	2	100.0	31	58.5	1	50.0	48	73.8	6	42.9	54	68.4
Frequency at which facility staff members use the N-95 and/or FFP2 respirators (n=79)														
Always	10	45.5	1	50.0	12	22.6	1	50.0	22	33.8	2	14.3	24	30.4
Sometimes	12	54.5	1	50.0	37	69.8	1	50.0	42	64.6	9	64.3	51	64.6
Never	0	0.0	0	0.0	4	7.5	0	0.0	1	1.5	3	21.4	4	5.1
Total	22	100.0	2	100.0	53	100.0	2	100.0	65	100.0	14	100.0	79	100.0

Table C2.25. Knowledge and practices of infection prevention control among providers interviewed (N=409)

	Providers who agreed with the statement	
	No.	%
Provider IPC Knowledge		
Doors and windows should be left open when a patient presumed or confirmed to have TB is in the room	407	99.5
Fans (ventilators) should be used in TB wards to reduce the transmission of TB	307	75.1
Presumed or confirmed TB patients should be separated from other patients	377	92.2
Healthcare providers should minimize the time TB patients spend in the health facility	367	89.7
Surgical masks protect healthcare providers from inhaling the TB bacteria	325	79.5
Provider IPC Practices		
Providers use a mask/respirator when treating TB presumptive or confirmed patients	302	73.8
Providers give priority to coughing patients, (i.e., attend to patients who are coughing first)	366	89.5
Providers educate TB patients on cough etiquette, (i.e., covering their mouth with hand, tissue, or elbow while coughing or sneezing, not spitting on the floor)	399	97.6
Providers keep all windows open	399	97.6
Providers are aware of the sitting arrangement with the patient, (i.e., patient not coughing in front of the health worker with the wind blowing toward the health worker)	348	85.1
Providers turn on fans to exhaust air outside the room, or blow air in the direction away from others when treating TB presumptive or confirmed cases	269	65.8
Providers request for TB diagnosis testing if the patient is symptomatic	393	96.1
Providers always screen all family members of confirmed TB patients for TB symptoms	366	89.7
Providers discuss with family members or those living with the TB patients, basic information and skills to protect household members and contacts from infection	377	92.2

Table C2.26. Staff TB screening systems and TB diagnosis, by facility type and location

	Facility Type								Facility Location				Total	
	Public Hospital		Private Hospital		Health Center		Other		Urban		Rural			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Facility has a system in place to screen and evaluate staff for TB disease (N=185)	15	51.7	1	20.0	53	36.6	0	0.0	52	40.6	17	29.8	69	37.3
Facilities with any staff diagnosed with active TB disease in the past year (n=69)	10	66.7	1	100.0	8	15.1	0	0.0	18	34.6	1	5.9	19	27.5

Table C2.27. Number and type of providers who reported having received TB training in the past 24 months (N=409)

	Health Worker Occupation Category					
	HEWs No.	HEWs %	Clinicians No.	Clinicians %	Total No.	Total %
Training in diagnosis methods						
Diagnosis of TB by clinical symptoms and signs	23	17.8	93	33.2	116	28.4
Diagnosis of TB by sputum smear microscopy	--	--	80	28.6	80	28.6
Diagnosis of TB by x-ray	--	--	68	24.3	68	24.3
Diagnosis of TB by Xpert MTB/RIF (GeneXpert)	--	--	76	27.1	76	27.1
Diagnosis of DR-TB	--	--	82	29.3	82	29.3
TB culture or growth medium (e.g., MGIT 960)	--	--	51	36.7	51	36.7
Line probe assay (LPA)	--	--	53	38.1	53	38.1
Referral for DR-TB diagnosis	--	--	83	29.6	83	29.6
Treatment of DS-TB	--	--	89	31.8	89	31.8
Training in treatment services						
Treatment of DR-TB	--	--	78	27.9	78	27.9
Referral for TB treatment	21	16.3	82	29.3	103	25.2
DOT	11	8.5	90	32.3	101	24.8
TB treatment follow-up services, (e.g., phone calls or home visits to TB patients)	18	14.0	79	28.4	97	23.8
Identification of and referral for patients who fail treatment	12	9.3	79	28.2	91	22.2
Training in HIV services						
HIV testing and counseling for TB patients	18	14.0	71	25.4	89	21.8
Referral for HIV testing and counseling for TB patients	18	14.0	63	22.5	81	19.8

	Health Worker Occupation Category					
	HEWs	HEWs	Clinicians	Clinicians	Total	Total
	No.	%	No.	%	No.	%
TPT for TB infection (isoniazid, 3RH, 3HP)	9	7.0	81	28.9	90	22.0
HIV care and treatment services for TB/HIV coinfected patients	13	10.1	78	27.9	91	22.2
ART for TB/HIV coinfected patients	7	14.9	62	42.2	69	35.6
Identification of TB/HIV drug-drug interactions	4	8.5	62	42.2	66	34.0
Identification of immune reconstitution inflammatory syndrome	--	--	51	34.7	51	34.7
CPT prophylaxis for TB/HIV coinfected patients	--	--	59	40.1	59	40.1
Viral load testing for TB/HIV coinfected patients	--	--	47	32.0	47	32.0

Table C2.28. Facility reporting staff receiving new or refresher training in the past 24 months (N=185)

	Facility Type								Facility Location				Total (N=185)	
	Public Hospital (n=29)		Private Hospital (n=5)		Health Center (n=145)		Other (n=6)		Urban (n=128)		Rural (n=57)			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Screening algorithm for TB	23	79.3	5	100.0	80	55.2	3	50.0	85	66.4	26	45.6	111	60.0
Screening or diagnosis of TB based on x-rays	19	65.5	2	40.0	49	33.8	2	33.3	58	45.3	14	24.6	72	38.9
Diagnosis of TB based on clinical symptoms or examination (for adults)	24	82.8	5	100.0	82	56.6	3	50.0	87	68.0	27	47.4	114	61.6
Diagnosis of TB based on sputum tests using smear microscopy	24	82.8	2	40.0	84	57.9	3	50.0	84	65.6	29	50.9	113	61.1
Diagnosis of TB based on sputum tests using culture	17	58.6	1	20.0	42	29.0	2	33.3	52	40.6	10	17.5	62	33.5
Diagnosis of TB using GeneXpert	22	75.9	2	40.0	58	40.0	2	33.3	68	53.1	16	28.1	84	45.4
Dispensing of drugs for TB treatment	25	86.2	4	80.0	81	55.9	3	50.0	86	67.2	27	47.4	113	61.1
Management of DS-TB treatment	24	82.8	4	80.0	82	56.6	3	50.0	85	66.4	28	49.1	113	61.1
Identification of presumptive DR-TB	23	79.3	4	80.0	59	40.7	2	33.3	72	56.3	16	28.1	88	47.6
Management of DR-TB treatment (n=58)	21	91.3	--	--	23	65.7	--	--	41	83.7	3	33.3	44	75.9
Management of TB/HIV coinfection	22	75.9	5	100.0	69	47.6	3	50.0	78	60.9	21	36.8	99	53.5
TB infection control	24	82.8	4	80.0	75	51.7	3	50.0	82	64.1	24	42.1	106	57.3
TB kit reconstitution	22	75.9	3	60.0	68	46.9	3	50.0	74	57.8	22	38.6	96	51.9

Table C2.29. Level of TB-related supervisory visits logged at the health facility in the past year, by health facility type and location

	Facility Type								Facility Location				Total	
	Public Hospital		Private Hospital		Health Center		Other		Urban		Rural			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Supervisor from woreda health office (n=159)	3	13.0	0	0.0	66	51.6	4	66.7	43	42.2	30	52.6	73	45.9
Supervisor from the Zonal/Sub-City health office (n=175)	3	12.0	1	20.0	31	22.3	0	0.0	27	22.9	8	14.0	35	20.0
Supervisor from the regional health office (N=185)	8	27.6	0	0.0	19	13.1	0	0.0	20	15.6	7	12.3	27	14.6
Supervisor from the federal health office (N=185)	4	13.8	0	0.0	8	5.5	0	0.0	11	8.6	1	1.8	12	6.5

Table C2.30. Activities undertaken during last supervisory visit, by facility type and location (n=151)

	Facility Type								Facility Location				Total	
	Public Hospital		Private Hospital		Health Center		Other		Urban		Rural			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Assess the pharmacy	15	68.2	3	75.0	103	86.6	6	100.0	87	82.1	40	88.9	127	84.1
Assess the TB data	20	90.9	4	100.0	110	92.4	6	100.0	98	92.5	42	93.3	140	92.7
Discuss the performance of the facility based on TB service data	16	72.7	4	100.0	102	85.7	6	100.0	89	84.0	39	86.7	128	84.8
Complete the supervisory checklist	19	86.4	3	75.0	100	84.0	3	50.0	86	81.1	39	86.7	125	82.8
Provide a record of written comments or suggestions from their visit	16	72.7	2	50.0	82	68.9	3	50.0	70	66.0	33	73.3	103	68.2

Table C2.31. TB policies, protocols, and guidelines observed, by facility type and location

	Facility Type								Facility Location				Total	
	Public Hospital		Private Hospital		Health Center		Other		Urban		Rural			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Flowcharts or algorithms on TB screening (N=185)	28	96.6	4	80.0	112	77.2	4	66.7	108	84.4	40	70.2	148	80.0
Flowcharts or algorithms on TB diagnosis (N=185)	27	93.1	5	100.0	120	85.1	4	66.7	115	90.6	41	75.9	156	86.2
National Guidelines for TB, DR-TB and Leprosy in Ethiopia (6th edition) (N=185)	18	62.1	2	40.0	69	47.6	1	16.7	64	50.0	26	45.6	90	48.6
Smear microscopy manual or guidelines (n=165)	24	88.9	5	100.0	105	82.7	4	66.7	100	84.0	38	82.6	138	83.6
Algorithms for GeneXpert (n=32)	19	79.2	--	--	8	100.0	--	--	27	84.4	--	--	27	84.4
Essential drug or medicines list (N=185)	20	69.0	3	60.0	106	73.1	4	66.7	93	72.7	40	70.2	133	71.9

Process Indicators

Table C3.1. Providers' practices: Questions asked at initial patient assessment (n=408)

	Health Worker Occupation				Total	
	HEW		Clinician			
	No.	%	No.	%	No.	%
Patient's previous medical/psychosocial history	59	46.1	142	50.7	201	49.3
Attitudes/beliefs toward TB	52	40.6	162	57.9	214	52.5
Knowledge of TB	86	67.2	236	84.3	322	78.9
Ability to follow the TB treatment plan	37	28.9	129	46.1	166	40.7
Barriers to treatment	38	29.7	110	39.3	148	36.3
Resources	30	23.4	96	34.3	126	30.9
Personal information	64	50.0	170	60.7	234	57.4

Table C3.2. Providers' practices: Other information discussed with patients during counseling

	Healthcare Worker Occupation				Total	
	HEW		Clinician			
	No.	%	No.	%	No.	%
Test results/What the test results mean (n=157)						
Verbally	27	87.1	119	95.2	146	93.6
Written	0	0.0	1	0.8	1	0.6
Both	4	12.9	5	4.0	9	5.8
What TB is (n=261)						
Verbally	58	86.6	171	88.1	229	87.7
Written	0	0.0	4	2.1	4	1.5
Both	9	13.4	19	9.8	28	10.7
How TB is spread (transmission) to others (n=327)						
Verbally	90	92.8	203	88.3	293	89.6
Written	0	0.0	5	2.2	5	1.5
Both	7	7.2	22	9.6	29	8.9
That TB can be cured (n=227)						
Verbally	62	95.4	149	92.0	211	93.0
Written	0	0.0	2	1.2	2	0.9
Both	3	4.6	11	6.8	14	6.2
The need for a treatment supporter (n=159)						
Verbally	35	100.0	116	93.5	151	95.0
Written	0	0.0	1	0.8	1	0.6
Both	0	0.0	7	5.6	7	4.4
How long treatment will last (n=221)						
Verbally	49	100.0	162	94.2	211	95.5
Written	0	0.0	3	1.7	3	1.4
Both	0	0.0	7	4.1	7	3.2
Treatment status or progress, including the treatment phase the patient is in (n=168)						
Verbally	35	97.2	124	93.9	159	94.6
Written	0	0.0	2	1.5	2	1.2
Both	1	2.8	6	4.5	7	4.2
Importance of taking medications regularly (n=272)						
Verbally	71	95.9	187	94.4	258	94.9
Written	0	0.0	2	1.0	2	0.7
Both	3	4.1	9	4.5	12	4.4
How the medications should be taken, (e.g., dosage, frequency) (n=189)						
Verbally	42	95.5	139	95.9	181	95.8
Written	1	2.3	0	0.0	1	0.5

	Healthcare Worker Occupation				Total	
	HEW		Clinician			
	No.	%	No.	%	No.	%
Both	1	2.3	6	4.1	7	3.7
Importance of taking medications for the full course of treatment (n=191)						
Verbally	41	95.3	139	93.9	180	94.2
Written	0	0.0	2	1.4	2	1.0
Both	2	4.7	7	4.7	9	4.7
Options available for treatment support, (e.g., DOT) (n=145)						
Verbally	22	88.0	113	94.2	135	93.1
Written	0	0.0	1	0.8	1	0.7
Both	3	12.0	6	5.0	9	6.2
What to do if they run out of their medication (n=116)						
Verbally	21	91.3	88	94.6	109	94
Written	0	0.0	1	1.1	1	0.9
Both	2	8.7	4	4.3	6	5.2
Possible side effects of TB medication (n=174)						
Verbally	21	91.3	88	94.6	168	96.6
Written	0	0.0	0	0.0	0	0.0
Both	1	3.3	5	3.5	6	3.4
What to do if they experience side effects from the TB medication (n=120)						
Verbally	15	93.8	97	92.4	112	92.6
Written	0	0.0	0	0.0	0	0.0
Both	1	6.3	8	7.7	9	7.4
Nutrition (n=291)						
Verbally	74	93.7	203	96.2	277	95.5
Written	1	1.3	2	0.9	3	1.0
Both	4	5.1	6	2.8	10	3.4
Good practices (no smoking or drinking alcohol, good hygiene, IPC, etc.) (n=198)						
Verbally	46	92.0	142	95.9	188	94.9
Written	0	0.0	0	0.0	0	0.0
Both	4	8.0	6	4.1	10	5.1
What to do when a patient misses their treatment (n=95)						
Verbally	17	100.0	75	96.2	92	96.8
Written	0	0.0	0	0.0	0	0.0
Both	0	0.0	3	3.8	3	3.2

Table C3.3. Patients' reports on the type of information shared with them by providers (N=539)

	Living Setting				Total	
	Urban		Rural			
	No.	%	No.	%	No.	%
How TB is spread to others						
No	52	14.3	43	24.6	95	17.6
Yes, prompted	129	35.4	63	36.0	192	35.6
Yes, unprompted	181	49.7	68	38.9	249	46.2
Don't know	1	0.3	1	0.6	2	0.4
No response	1	0.3	0	0.0	1	0.2
Cough hygiene, (i.e., how to reduce the risk of making others sick by covering your mouth when you cough)						
No	45	12.4	37	21.1	82	15.2
Yes, prompted	158	43.4	72	41.1	230	42.7
Yes, unprompted	155	42.6	65	37.1	220	40.8
Don't know	5	1.4	1	0.6	6	1.1
No response	1	0.3	0	0.0	1	0.2
That TB can be cured						
No	22	6.0	17	9.7	39	7.2
Yes, prompted	207	56.9	107	61.1	314	58.3
Yes, unprompted	131	36	51	29.1	182	33.8
Don't know	2	0.5	0	0.0	2	0.4
No response	2	0.5	0	0.0	2	0.4
How long your treatment will last						
No	18	4.9	18	10.3	36	6.7
Yes, prompted	216	59.3	117	66.9	333	61.8
Yes, unprompted	127	34.9	39	22.3	166	30.8
Don't know	1	0.3	1	0.6	2	0.4
No response	2	0.5	0	0.0	2	0.4
Danger signs of TB getting worse						
No	133	36.5	86	49.1	219	40.6
Yes, prompted	176	48.4	74	42.3	250	46.4
Yes, unprompted	52	14.3	12	6.9	64	11.9
Don't know	1	0.3	3	1.7	4	0.7
No response	2	0.5	0	0.0	2	0.4
The importance of taking the medicines regularly						
No	29	8.0	17	9.7	46	8.5
Yes, prompted	160	44.0	93	53.1	253	46.9
Yes, unprompted	174	47.8	63	36.0	237	44.0
Don't know	1	0.3	1	0.6	2	0.4
No response	0	0.0	1	0.6	1	0.2
Side effects of the medicines						
No	112	30.8	81	46.3	193	35.8

	Living Setting				Total	
	Urban		Rural			
	No.	%	No.	%	No.	%
Yes, prompted	192	52.7	76	43.4	268	49.7
Yes, unprompted	58	15.9	15	8.6	73	13.5
Don't know	2	0.5	2	1.1	4	0.7
No response	0	0.0	1	0.6	1	0.2
What to do if you have side effects from the medicine						
No	134	36.8	99	56.6	233	43.2
Yes, prompted	188	51.6	62	35.4	250	46.4
Yes, unprompted	38	10.4	10	5.7	48	8.9
Don't know	3	0.8	3	1.7	6	1.1
No response	1	0.3	1	0.6	2	0.4
The need for sputum tests at given points during your treatment						
No	131	36.0	74	42.3	205	38.0
Yes, prompted	188	51.6	89	50.9	277	51.4
Yes, unprompted	37	10.2	7	4.0	44	8.2
Don't know	4	1.1	4	2.3	8	1.5
No response	4	1.1	1	0.6	5	0.9
The importance of taking the medicines through the end of the treatment						
No	30	8.2	23	13.1	53	9.8
Yes, prompted	214	58.8	103	58.9	317	58.8
Yes, unprompted	116	31.9	47	26.9	163	30.2
Don't know	1	0.3	2	1.1	3	0.6
No response	3	0.8	0	0.0	3	0.6
When to come back for the next care visit for TB						
No	49	13.5	29	16.6	78	14.5
Yes, prompted	246	67.6	114	65.1	360	66.8
Yes, unprompted	63	17.3	28	16.0	91	16.9
Don't know	4	1.1	4	2.3	8	1.5
No response	2	0.5	0	0.0	2	0.4
Healthy behaviors to follow (e.g., no alcohol drinking, good hygiene)						
No	59	16.2	40	22.9	99	18.4
Yes, prompted	171	47.0	82	46.9	253	46.9
Yes, unprompted	123	33.8	48	27.4	171	31.7
Don't know	5	1.4	5	2.9	10	1.9
No response	6	1.6	0	0.0	6	1.1

Table C3.4. Providers' perspective: time spent providing services (N=409)

	No.	%
Number of hours per week providing TB services		
Fewer than 10–20	224	56.1
21–40	109	27.3
Greater than or equal to 41–60	66	16.5
Mean (median) [range: 1–60]	17 (7)	

Table C3.5. Reasons why patients stopped taking medications

	No.	%
Patients who have ever stopped taking their medicines (n=539)	7	1.3
Reasons why patients stopped taking TB medicine (n=7)		
Medicines were not available at the facility	3	42.9
Forgot to take them	1	14.3
No time to get medicines	1	14.3
Other	2	24.6

Table C3.6. Patients' knowledge of TB symptoms (N=539)

	Type of TB Diagnosed as Reported by the Patient				Facility Location				Total	
	Yes, DS-TB and DR-TB		Yes, EXPTB		Urban		Rural			
	No.	%	No.	%	No.	%	No.	%	No.	%
Chronic cough (more than 2 weeks)										
No	8	1.9	11	10.1	10	2.7	9	5.1	19	3.5
Yes, prompted	83	19.3	22	20.2	61	16.8	44	25.1	105	19.5
Yes, unprompted	339	78.8	69	63.3	289	79.4	119	68.0	408	75.7
Don't know	0	0.0	7	6.4	4	1.1	3	1.7	7	1.3
Coughing up mucus or phlegm										
No	44	10.2	22	20.2	37	10.2	29	16.6	66	12.2
Yes, prompted	245	57.0	48	44.0	202	55.5	91	52.0	293	54.4
Yes, unprompted	136	31.6	28	25.7	115	31.6	49	28.0	164	30.4
Don't know	5	1.2	11	10.1	10	2.7	6	3.4	16	3.0
Blood-streaked mucus or sputum										
No	112	26.0	27	24.8	91	25.0	48	27.4	139	25.8
Yes, prompted	209	48.6	43	39.4	175	48.1	77	44.0	252	46.8
Yes, unprompted	89	20.7	14	12.8	71	19.5	32	18.3	103	19.1
Don't know	20	4.7	25	22.9	27	7.4	18	10.3	45	8.3
Unexplained weight loss										
No	17	4.0	7	6.4	15	4.1	9	5.1	24	4.5
Yes, prompted	263	61.2	59	54.1	219	60.2	103	58.9	322	59.7
Yes, unprompted	136	31.6	34	31.2	121	33.2	49	28.0	170	31.5
Don't know	14	3.3	9	8.3	9	2.5	14	8.0	23	4.3
Fever and/or chills										
No	31	7.2	6	5.5	27	7.4	10	5.7	37	6.9
Yes, prompted	223	51.9	56	51.4	181	49.7	98	56.0	279	51.8
Yes, unprompted	164	38.1	36	33.0	145	39.8	55	31.4	200	37.1
Don't know	12	2.8	11	10.1	11	3.0	12	6.9	23	4.3
Night sweats										
No	21	4.9	8	7.3	17	4.7	12	6.9	29	5.4
Yes, prompted	247	57.4	66	60.6	208	57.1	105	60.0	313	58.1
Yes, unprompted	156	36.3	23	21.1	130	35.7	49	28.0	179	33.2
Don't know	6	1.4	12	11.0	9	2.5	9	5.1	18	3.3
Persistent shortness of breath										
No	36	8.4	13	11.9	36	9.9	13	7.4	49	9.1
Yes, prompted	269	62.6	74	67.9	231	63.5	112	64.0	343	63.6
Yes, unprompted	112	26.0	13	11.9	83	22.8	42	24.0	125	23.2
Don't know	13	3.0	9	8.3	14	3.8	8	4.6	22	4.1

	Type of TB Diagnosed as Reported by the Patient				Facility Location				Total	
	Yes, DS-TB and DR-TB		Yes, EXPTB		Urban		Rural			
	No.	%	No.	%	No.	%	No.	%	No.	%
Tiredness/fatigue										
No	24	5.6	6	5.5	19	5.2	11	6.3	30	5.6
Yes, prompted	204	47.4	56	51.4	173	47.5	87	49.7	260	48.2
Yes, unprompted	201	46.7	45	41.3	170	46.7	76	43.4	246	45.6
Don't know	1	0.2	2	1.8	2	0.5	1	0.6	3	0.6
Pain in the chest or back										
No	31	7.2	8	7.3	27	7.4	12	6.9	39	7.2
Yes, prompted	247	57.4	59	54.1	212	58.2	94	53.7	306	56.8
Yes, unprompted	146	34.0	33	30.3	116	31.9	63	36	179	33.2
Don't know	6	1.4	9	8.3	9	2.5	6	3.4	15	2.8
Other symptoms										
No	259	70.8	75	74.3	234	73.6	100	67.1	334	71.5
Yes, prompted	7	1.9	1	1.0	5	1.6	3	2	8	1.7
Yes, unprompted	40	10.9	14	13.9	38	11.9	16	10.7	54	11.6
Don't know	60	16.4	11	10.9	41	12.9	30	20.1	71	15.2

Table C3.7. Patients' knowledge of TB causes (N=539)

Knowledge of the causes of TB, by type of TB patients	Type of TB Diagnosed as Reported by the Patient					
	Yes, DS-TB and DR-TB		Yes, EXPTB		Total	
	No.	%	No.	%	No.	%
Germs/bacteria						
No	68	15.8	14	12.8	82	15.2
Yes, prompted	174	40.5	41	37.6	215	39.9
Yes, unprompted	83	19.3	24	22.0	107	19.9
Don't know	105	24.4	30	27.5	135	25.0
Infected person coughing or sneezing						
No	6	1.4	4	3.7	10	1.9
Yes, prompted	126	29.3	15	13.8	141	26.2
Yes, unprompted	285	66.3	86	78.9	371	68.8
Don't know	13	3.0	4	3.7	17	3.2
Crowded living conditions						
No	26	6.0	13	11.9	39	7.2
Yes, prompted	308	71.6	67	61.5	375	69.6
Yes, unprompted	69	16.0	17	15.6	86	16.0
Don't know	27	6.3	12	11.0	39	7.2
Blood transfusions						
No	182	42.3	55	50.5	237	44.0
Yes, prompted	140	32.6	23	21.1	163	30.2
Yes, unprompted	11	2.6	3	2.8	14	2.6
Don't know	97	22.6	28	25.7	125	23.2
Sharing utensils						
No	59	13.7	15	13.8	74	13.7
Yes, prompted	150	34.9	30	27.5	180	33.4
Yes, unprompted	189	44.0	55	50.5	244	45.3
Don't know	32	7.4	9	8.3	41	7.6
Touching a person with TB						
No	262	60.9	75	68.8	337	62.5
Yes, prompted	111	25.8	15	13.8	126	23.4
Yes, unprompted	29	6.7	5	4.6	34	6.3
Don't know	28	6.5	14	12.8	42	7.8
Through food						
No	154	35.8	46	42.2	200	37.1
Yes, prompted	164	38.1	25	22.9	189	35.1
Yes, unprompted	92	21.4	28	25.7	120	22.3
Don't know	20	4.7	10	9.2	30	5.6
Mosquito bites						
No	249	57.9	53	48.6	302	56.0
Yes, prompted	104	24.2	31	28.4	135	25.0

Knowledge of the causes of TB, by type of TB patients	Type of TB Diagnosed as Reported by the Patient					
	Yes, DS-TB and DR-TB		Yes, EXPTB		Total	
	No.	%	No.	%	No.	%
Yes, unprompted	3	0.7	1	0.9	4	0.7
Don't know	74	17.2	24	22.0	98	18.2
Sexual contact						
No	196	45.6	54	49.5	250	46.4
Yes, prompted	134	31.2	27	24.8	161	29.9
Yes, unprompted	20	4.7	3	2.8	23	4.3
Don't know	80	18.6	25	22.9	105	19.5
Smoking						
No	91	21.2	34	31.2	125	23.2
Yes, prompted	246	57.2	54	49.5	300	55.7
Yes, unprompted	32	7.4	0	0.0	32	5.9
Don't know	61	14.2	21	19.3	82	15.2
Other						
No	278	75.3	86	85.1	364	77.4
Yes, prompted	1	0.3	0	0.0	1	0.2
Yes, unprompted	17	4.6	3	3.0	20	4.3
Don't know	73	19.8	12	11.9	85	18.1

Table C3.8. Patients' knowledge of TB risk factors (N=539)

	Type of TB Diagnosed as Reported by the Patient				Facility Location				Total	
	Yes, DS-TB and DR-TB		Yes, EXPTB		Urban		Rural			
	No.	%	No.	%	No.	%	No.	%	No.	%
Smoking										
No	22	5.1	9	8.3	17	4.7	14	8.0	31	5.8
Yes, prompted	216	50.2	64	58.7	171	47.0	109	62.3	280	51.9
Yes, unprompted	157	36.5	23	21.1	145	39.8	35	20.0	180	33.4
Don't know	35	8.1	13	11.9	31	8.5	17	9.7	48	8.9
Alcohol drinking										
No	44	10.2	9	8.3	38	10.4	15	8.6	53	9.8
Yes, prompted	237	55.1	60	55.0	188	51.6	109	62.3	297	55.1
Yes, unprompted	106	24.7	24	22.0	108	29.7	22	12.6	130	24.1
Don't know	43	10.0	16	14.7	30	8.2	29	16.6	59	10.9
Fatigue										
No	79	18.4	15	13.8	63	17.3	31	17.7	94	17.4
Yes, prompted	237	55.1	59	54.1	196	53.8	100	57.1	296	54.9
Yes, unprompted	75	17.4	20	18.3	68	18.7	27	15.4	95	17.6
Don't know	39	9.1	15	13.8	37	10.2	17	9.7	54	10.0
Malnutrition										
No	72	16.7	9	8.3	56	15.4	25	14.3	81	15.0
Yes, prompted	250	58.1	74	67.9	207	56.9	117	66.9	324	60.1
Yes, unprompted	88	20.5	15	13.8	76	20.9	27	15.4	103	19.1
Don't know	20	4.7	11	10.1	25	6.9	6	3.4	31	5.8
Unhygienic practices										
No	54	12.6	13	11.9	41	11.3	26	14.9	67	12.5
Yes, prompted	299	69.7	66	60.6	250	68.9	115	65.7	365	67.8
Yes, unprompted	53	12.4	14	12.8	51	14.0	16	9.1	67	12.5
Don't know	23	5.4	16	14.7	21	5.8	18	10.3	39	7.2
Poor ventilation										
No	55	12.8	10	9.2	36	9.9	29	16.6	65	12.1
Yes, prompted	300	69.8	67	61.5	256	70.3	111	63.4	367	68.1
Yes, unprompted	47	10.9	14	12.8	46	12.6	15	8.6	61	11.3
Don't know	28	6.5	18	16.5	26	7.1	20	11.4	46	8.5
Pollution										
No	60	14.0	10	9.2	46	12.7	24	13.7	70	13.0
Yes, prompted	266	62.0	62	56.9	226	62.3	102	58.3	328	61.0
Yes, unprompted	53	12.4	20	18.3	55	15.2	18	10.3	73	13.6
Don't know	50	11.7	17	15.6	36	9.9	31	17.7	67	12.5

	Type of TB Diagnosed as Reported by the Patient				Facility Location				Total	
	Yes, DS-TB and DR-TB		Yes, EXPTB		Urban		Rural			
	No.	%	No.	%	No.	%	No.	%	No.	%
Being HIV infected										
No	77	17.9	16	14.7	48	13.2	45	25.7	93	17.3
Yes, prompted	262	61.1	65	59.6	238	65.6	89	50.9	327	60.8
Yes, unprompted	21	4.9	6	5.5	23	6.3	4	2.3	27	5.0
Don't know	69	16.1	22	20.2	54	14.9	37	21.1	91	16.9
Contact with or living with someone who has TB										
No	42	9.8	14	12.8	38	10.4	18	10.3	56	10.4
Yes, prompted	258	60.0	67	61.5	220	60.4	105	60.0	325	60.3
Yes, unprompted	111	25.8	21	19.3	94	25.8	38	21.7	132	24.5
Don't know	19	4.4	7	6.4	12	3.3	14	8.0	26	4.8
Inherited										
No	286	66.5	78	71.6	247	67.9	117	66.9	364	67.5
Yes, prompted	78	18.1	16	14.7	59	16.2	35	20.0	94	17.4
Yes, unprompted	5	1.2	0	0.0	5	1.4	0	0.0	5	0.9
Don't know	61	14.2	15	13.8	53	14.6	23	13.1	76	14.1
Having diabetes										
No	168	39.2	45	41.3	137	37.7	76	43.4	213	39.6
Yes, prompted	124	28.9	27	24.8	108	29.8	43	24.6	151	28.1
Yes, unprompted	5	1.2	1	0.9	4	1.1	2	1.1	6	1.1
Don't know	132	30.8	36	33.0	114	31.4	54	30.9	168	31.2
Poverty										
No	161	37.4	38	34.9	143	39.3	56	32.0	199	36.9
Yes, prompted	197	45.8	53	48.6	160	44.0	90	51.4	250	46.4
Yes, unprompted	19	4.4	4	3.7	18	4.9	5	2.9	23	4.3
Don't know	53	12.3	14	12.8	43	11.8	24	13.7	67	12.4
Overcrowding										
No	94	21.9	31	28.4	86	23.6	39	22.3	125	23.2
Yes, prompted	269	62.6	63	57.8	222	61.0	110	62.9	332	61.6
Yes, unprompted	30	7.0	0	0.0	26	7.1	4	2.3	30	5.6
Don't know	37	8.6	15	13.8	30	8.2	22	12.6	52	9.6
Other										
No	281	76.2	86	86.0	256	80.8	111	73.0	367	78.3
Yes, prompted	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Yes, unprompted	16	4.3	3	3.0	10	3.2	9	5.9	19	4.1
Don't know	72	19.5	11	11.0	51	16.1	32	21.1	83	17.7

Table C3.9. Patients' knowledge of TB drug side effects, by TB diagnosis type and facility location (N=539)

	Type of TB Diagnosed as Reported by the Patient				Facility Location				Total	
	Yes, DS-TB and DR-TB		Yes, EXPTB		Urban		Rural			
	No.	%	No.	%	No.	%	No.	%	No.	%
Nausea										
No	139	32.3	53	48.6	124	34.1	68	38.9	192	35.6
Yes, prompted	180	41.9	39	35.8	141	38.7	78	44.6	219	40.6
Yes, unprompted	98	22.8	11	10.1	90	24.7	19	10.9	109	20.2
Don't know	13	3.0	6	5.5	9	2.5	10	5.7	19	3.5
Vomiting										
No	214	49.8	59	54.1	178	48.9	95	54.3	273	50.6
Yes, prompted	137	31.9	32	29.4	117	32.1	52	29.7	169	31.4
Yes, unprompted	65	15.1	12	11.0	60	16.5	17	9.7	77	14.3
Don't know	14	3.3	6	5.5	9	2.5	11	6.3	20	3.7
Heartburn										
No	124	28.8	37	33.9	122	33.5	39	22.3	161	29.9
Yes, prompted	193	44.9	42	38.5	145	39.8	90	51.4	235	43.6
Yes, unprompted	100	23.3	24	22.0	90	24.7	34	19.4	124	23.0
Don't know	13	3.0	6	5.5	7	1.9	12	6.9	19	3.5
Loss of appetite										
No	151	35.1	46	42.2	139	38.2	58	33.1	197	36.5
Yes, prompted	197	45.8	38	34.9	152	41.8	83	47.4	235	43.6
Yes, unprompted	73	17.0	20	18.3	66	18.1	27	15.4	93	17.3
Don't know	9	2.1	5	4.6	7	1.9	7	4.0	14	2.6
Discolored urine or tears										
No	41	9.5	7	6.4	31	8.5	17	9.7	48	8.9
Yes, prompted	273	63.5	72	66.1	226	62.1	119	68.0	345	64.0
Yes, unprompted	112	26.0	26	23.9	102	28.0	36	20.6	138	25.6
Don't know	4	0.9	4	3.7	5	1.4	3	1.7	8	1.5
Fever										
No	143	33.3	44	40.4	139	38.2	48	27.4	187	34.7
Yes, prompted	199	46.3	43	39.4	153	42.0	89	50.9	242	44.9
Yes, unprompted	78	18.1	15	13.8	65	17.9	28	16.0	93	17.3
Don't know	10	2.3	7	6.4	7	1.9	10	5.7	17	3.2
Yellowish eyes										
No	241	56.0	53	48.6	215	59.1	79	45.1	294	54.5
Yes, prompted	141	32.8	42	38.5	111	30.5	72	41.1	183	34.0
Yes, unprompted	22	5.1	4	3.7	22	6.0	4	2.3	26	4.8
Don't know	26	6.0	10	9.2	16	4.4	20	11.4	36	6.7
Problems with eyesight										
No	236	54.9	51	46.8	210	57.7	77	44.0	287	53.2

	Type of TB Diagnosed as Reported by the Patient				Facility Location				Total	
	Yes, DS-TB and DR-TB		Yes, EXPTB		Urban		Rural			
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes, prompted	150	34.9	47	43.1	127	34.9	70	40.0	197	36.5
Yes, unprompted	24	5.6	0	0.0	14	3.8	10	5.7	24	4.5
Don't know	20	4.7	11	10.1	13	3.6	18	10.3	31	5.8
Joint pain										
No	132	30.7	34	31.2	121	33.2	45	25.7	166	30.8
Yes, prompted	233	54.2	53	48.6	191	52.5	95	54.3	286	53.1
Yes, unprompted	51	11.9	14	12.8	43	11.8	22	12.6	65	12.1
Don't know	14	3.3	8	7.3	9	2.5	13	7.4	22	4.1
Rash/itchiness										
No	199	46.3	51	46.8	173	47.5	77	44.0	250	46.4
Yes, prompted	176	40.9	37	33.9	145	39.8	68	38.9	213	39.5
Yes, unprompted	36	8.4	12	11.0	34	9.3	14	8.0	48	8.9
Don't know	19	4.4	9	8.3	12	3.3	16	9.1	28	5.2
Tingling, burning, or numbness of the hands and feet										
No	151	35.1	43	39.4	149	40.9	45	25.7	194	36.0
Yes, prompted	212	49.3	43	39.4	160	44.0	95	54.3	255	47.3
Yes, unprompted	43	10.0	12	11.0	38	10.4	17	9.7	55	10.2
Don't know	24	5.6	11	10.1	17	4.7	18	10.3	35	6.5
Abdominal pain										
No	220	51.2	55	50.5	196	53.8	79	45.1	275	51.0
Yes, prompted	159	37.0	32	29.4	127	34.9	64	36.6	191	35.4
Yes, unprompted	37	8.6	14	12.8	32	8.8	19	10.9	51	9.5
Don't know	14	3.3	8	7.3	9	2.5	13	7.4	22	4.1
Tinnitus (noise or ringing in the ears)										
No	192	44.7	54	49.5	181	49.7	65	37.1	246	45.6
Yes, prompted	208	48.4	38	34.9	156	42.9	90	51.4	246	45.6
Yes, unprompted	17	4.0	5	4.6	17	4.7	5	2.9	22	4.1
Don't know	13	3.0	12	11.0	10	2.7	15	8.6	25	4.6
Fatigue										
No	53	12.3	21	19.3	54	14.8	20	11.4	74	13.7
Yes, prompted	220	51.2	49	45.0	175	48.1	94	53.7	269	49.9
Yes, unprompted	146	34.0	31	28.4	129	35.4	48	27.4	177	32.8
Don't know	11	2.6	8	7.3	6	1.6	13	7.4	19	3.5
Insomnia										
No	188	43.7	57	52.3	181	49.7	64	36.6	245	45.5
Yes, prompted	194	45.1	39	35.8	149	40.9	84	48.0	233	43.2
Yes, unprompted	29	6.7	3	2.8	21	5.8	11	6.3	32	5.9
Don't know	19	4.4	10	9.2	13	3.6	16	9.1	29	5.4
Balance issues (loss of balance)										

	Type of TB Diagnosed as Reported by the Patient				Facility Location				Total	
	Yes, DS-TB and DR-TB		Yes, EXPTB		Urban		Rural			
	No.	%	No.	%	No.	%	No.	%	No.	%
No	188	43.7	53	48.6	174	47.8	67	38.3	241	44.7
Yes, prompted	195	45.3	40	36.7	152	41.8	83	47.4	235	43.6
Yes, unprompted	33	7.7	5	4.6	25	6.9	13	7.4	38	7.1
Don't know	14	3.3	11	10.1	13	3.6	12	6.9	25	4.6
Hearing loss										
No	259	60.2	61	56.0	234	64.3	86	49.1	320	59.4
Yes, prompted	141	32.8	36	33.0	106	29.1	71	40.6	177	32.8
Yes, unprompted	11	2.6	0	0.0	9	2.5	2	1.1	11	2.0
Don't know	19	4.4	12	11.0	15	4.1	16	9.1	31	5.8
Mental disorders (psychosis, depression, anxiety)										
No	225	52.3	57	52.3	197	54.1	85	48.6	282	52.3
Yes, prompted	164	38.1	39	35.8	136	37.4	67	38.3	203	37.7
Yes, unprompted	24	5.6	3	2.8	19	5.2	8	4.6	27	5.0
Don't know	17	4.0	10	9.2	12	3.3	15	8.6	27	5.0
Diarrhea										
No	312	72.6	78	71.6	282	77.5	108	61.7	390	72.4
Yes, prompted	79	18.4	16	14.7	51	14.0	44	25.1	95	17.6
Yes, unprompted	17	4.0	3	2.8	14	3.8	6	3.4	20	3.7
Don't know	22	5.1	12	11.0	17	4.7	17	9.7	34	6.3
Other										
No	300	80.6	85	83.3	267	83.2	118	77.1	385	81.2
Yes, prompted	2	0.5	3	2.9	4	1.2	1	0.7	5	1.1
Yes, unprompted	8	2.2	2	2.0	3	0.9	7	4.6	10	2.1
Don't know	62	16.7	12	11.8	47	14.6	27	17.6	74	15.6

Table C3.10. Patients' perceived feelings of stigma/discrimination from facility, community, and self (N=539)

Facility-Level Discrimination	Total	
	No.	%
Overall, I feel welcome in this health facility		
Strongly disagree	4	0.7
Disagree	65	12.1
Neither agree nor disagree	5	0.9
Agree	294	54.5
Strongly agree	171	31.7
Healthcare providers here turn their face away when speaking with me		
Strongly disagree	128	23.7
Disagree	333	61.8
Neither agree nor disagree	11	2.0
Agree	52	9.6
Strongly agree	14	2.6
Overall, healthcare providers here treat me with respect		
Strongly disagree	8	1.5
Disagree	61	11.3
Neither agree nor disagree	7	1.3
Agree	315	58.4
Strongly agree	147	27.3
Healthcare providers at this facility show discriminatory attitudes toward me because of my disease		
Strongly disagree	136	25.2
Disagree	341	63.3
Neither agree nor disagree	9	1.7
Agree	42	7.8
Strongly agree	11	2.0
Overall, the healthcare providers are friendly to me		
Strongly disagree	7	1.3
Disagree	81	15
Neither agree nor disagree	40	7.4
Agree	308	57.1
Strongly agree	103	19.1
Overall, the healthcare providers treat me the same way I am treated when I receive care for other illnesses		
Strongly disagree	2	0.4
Disagree	91	16.9
Neither agree nor disagree	27	5.0
Agree	312	57.9
Strongly agree	106	19.7
Healthcare workers have avoided touching me		
Strongly disagree	140	26.0

Disagree	336	62.3
Neither agree nor disagree	8	1.5
Agree	47	8.7
Strongly agree	8	1.5
Overall, I feel distressed, intimidated, or offended when interacting with healthcare providers at this facility		
Strongly disagree	126	23.4
Disagree	344	63.8
Neither agree nor disagree	7	1.3
Agree	54	10.0
Strongly agree	8	1.5
Community-Level Stigma/Discrimination	**Total**	
	No.	**%**
I felt hurt when I saw how people reacted to learning I have TB		
Strongly disagree	109	20.6
Disagree	316	59.6
Neither agree nor disagree	10	1.9
Agree	79	14.9
Strongly agree	16	3.0
I stopped going to social events, religious services, or community events because of negative reactions to my disease		
Strongly disagree	86	16.2
Disagree	301	56.8
Neither agree nor disagree	10	1.9
Agree	109	20.6
Strongly agree	24	4.5
People do not want to eat or drink with me because I have TB		
Strongly disagree	75	14.2
Disagree	305	57.5
Neither agree nor disagree	17	3.2
Agree	112	21.1
Strongly agree	21	4.0
I keep a distance from others to avoid spreading germs from TB		
Strongly disagree	30	5.7
Disagree	158	29.8
Neither agree nor disagree	12	2.3
Agree	259	48.9
Strongly agree	70	13.2
Family members keep a distance from me because I have TB		
Strongly disagree	136	26.2
Disagree	314	60.5
Neither agree nor disagree	9	1.7
Agree	48	9.2

Strongly agree	11	2.1
Family members feel guilt in the community because I have TB		
Strongly disagree	133	25.6
Disagree	320	61.7
Neither agree nor disagree	13	2.5
Agree	45	8.7
Strongly agree	7	1.3
I lost friends when I told them I have TB		
Strongly disagree	117	25.2
Disagree	280	60.3
Neither agree nor disagree	6	1.3
Agree	53	11.4
Strongly agree	8	1.7
Stigmatizing Emotions	**Total**	
	No.	**%**
I feel that I need to hide the fact that I have TB		
Strongly disagree	125	23.2
Disagree	316	58.6
Neither agree nor disagree	6	1.1
Agree	78	14.5
Strongly agree	14	2.6
I worry that people who know I have TB will tell others		
Strongly disagree	116	21.5
Disagree	312	57.9
Neither agree nor disagree	12	2.2
Agree	87	16.1
Strongly agree	12	2.2
I am very careful who I tell that I have TB		
Strongly disagree	62	11.5
Disagree	264	49.0
Neither agree nor disagree	18	3.3
Agree	166	30.8
Strongly agree	29	5.4
I worry that in this community most people with TB are denied involvement		
Strongly disagree	91	16.9
Disagree	313	58.1
Neither agree nor disagree	18	3.3
Agree	103	19.1
Strongly agree	14	2.6
I worry that in this community people believe a person who has TB is dirty		
Strongly disagree	86	16.0
Disagree	337	62.5
Neither agree nor disagree	20	3.7
Agree	86	16.0

Strongly agree	10	1.9
It is difficult to tell people about my disease		
Strongly disagree	87	16.1
Disagree	312	57.9
Neither agree nor disagree	15	2.8
Agree	109	20.2
Strongly agree	16	3.0
I feel guilty that I have TB		
Strongly disagree	122	22.6
Disagree	286	53.1
Neither agree nor disagree	9	1.7
Agree	107	19.9
Strongly agree	14	2.6
I feel ashamed that I have TB		
Strongly disagree	125	23.2
Disagree	315	58.4
Neither agree nor disagree	6	1.1
Agree	83	15.4
Strongly agree	9	1.7
I sometimes feel worthless because I have TB		
Strongly disagree	130	24.1
Disagree	324	60.1
Neither agree nor disagree	7	1.3
Agree	65	12.1
Strongly agree	12	2.2
Having TB makes me feel like I am a bad person		
Strongly disagree	137	25.4
Disagree	343	63.6
Neither agree nor disagree	7	1.3
Agree	44	8.2
Strongly agree	8	1.5
I feel I am not as good as others because I have TB		
Strongly disagree	128	23.7
Disagree	305	56.6
Neither agree nor disagree	4	0.7
Agree	83	15.4
Strongly agree	19	3.5
I feel I look disgusting because I have TB		
Strongly disagree	153	28.4
Disagree	331	61.4
Neither agree nor disagree	9	1.7
Agree	39	7.2
Strongly agree	6	1.1

Table C3.11. Affordability of TB services (N=539)

	Total	
	No.	%
Sputum test		
Not taken test	229	42.5
Yes, taken test and paid	83	26.8
Yes, taken test and not paid	227	73.2
Don't know	0	0.0
Blood test		
Not taken test	194	36.0
Yes, taken test and paid	164	48.1
Yes, taken test and not paid	175	51.3
Don't know	3	0.6
x-ray		
Not taken test	315	58.4
Yes, taken test and paid	152	74.5
Yes, taken test and not paid	50	24.5
Don't know	18	3.3
Do you have to pay to see a healthcare provider at this facility for routine TB visits?		
No	508	94.2
Yes	29	5.4
Do you incur any other costs for TB, including informal payments?		
No	527	97.8
Yes	10	1.9
Have you ever been unable to come to the health facility because of cost?		
No	513	95.2
Yes	22	4.1

Table C3.12. Support services desired and received by TB patients at facilities (N=539)

	Living Setting					
	Urban		Rural		Total	
	No.	%	No.	%	No.	%
Services received						
Free TB medicines	358	98.4	166	94.9	524	97.2
Home-based treatment	19	5.2	9	5.1	28	5.2
Nutritional support/food basket	19	5.2	6	3.4	25	4.6
Rehabilitative services	11	3.0	1	0.6	12	2.2
Transport assistance	5	1.4	0	0.0	5	0.9
Small group TB health education session	35	9.6	18	10.3	53	9.8
One-on-one counseling (face to face) by medical staff (doctor, Health Officer)	180	49.5	90	51.4	270	50.1
One-on-one counseling (face to face) by HEW	45	12.4	28	16.0	73	13.5
One-on-one peer counseling (face to face) by either a lay or peer counselor	28	7.7	8	4.6	36	6.7
Meeting with a psychologist	10	2.7	1	0.6	11	2.0
Service desired						
Free TB medicines	131	99.2	46	97.9	177	98.9
Home-based treatment	77	58.3	28	59.6	105	58.7
Nutritional support/food basket	100	75.8	35	74.5	135	75.4
Rehabilitative services	112	85.5	40	85.1	152	85.4
Transport assistance	90	68.2	33	70.2	123	68.7
Small group TB health education session	112	84.8	38	80.9	150	83.8
One-on-one counseling (face to face) by medical staff (doctor, Health Officer)	125	94.7	44	93.6	169	94.4
One-on-one counseling (face to face) by HEW	105	79.5	38	80.9	143	79.9
One-on-one peer counseling (face to face) by either a lay or peer counselor	107	81.1	31	66.0	138	77.1
Meeting with a psychologist	111	84.1	38	80.9	149	83.2

Table C3.13. Overall patient satisfaction, by gender and residence (N=395)

	Characteristics								Total	
	Sex of Patient				Patient Living Setting					
	Male		Female		Urban		Rural			
Satisfaction Level	No.	%	No.	%	No.	%	No.	%	No.	%
Very dissatisfied	6	1.9	5	2.2	4	1.1	7	4.0	11	2.0
Dissatisfied	12	3.9	11	4.8	16	4.4	7	4.0	23	4.3
Neither satisfied nor dissatisfied	19	6.1	4	1.7	15	4.1	8	4.6	23	4.3
Satisfied	157	50.8	118	51.3	201	55.2	74	42.3	275	51.0
Very satisfied	115	37.2	92	40.0	128	35.2	79	45.1	207	38.4

Outcome Indicators

Table C4.1. Diagnosis outcomes recorded for smear microscopy and GeneXpert MTB/RIF (OPD or Presumptive TB Register)

	No.	%
Smear Microscopy		
Patients with presumptive TB who received a smear microscopy test	2,102	
Patients with presumptive TB with smear microscopy test results (n=2,102)	1,794	85.0
Patients with presumptive TB with positive smear microscopy test results (n=1,794)	230	13.0
GeneXpert		
Patients with presumptive TB who received a GeneXpert test	3,485	
Patients with presumptive TB with GeneXpert test results (n=3,485)	3,116	89.0
Patients with presumptive TB with positive GeneXpert test results (n=3,116)	656	21.0

Table C4.2. DS-TB treatment outcomes, by facility type (N=5,244)

	Facility Type								Total	
	Public Hospital		Private Hospital		Health Center		Other			
	No.	%	No.	%	No.	%	No.	%	No.	%
Cured	447	27.2	13	18.1	1114	32.2	16	22.9	1,590	30.3
Completed treatment	732	44.5	54	75.0	1938	56.1	39	55.7	2,763	52.7
Failure	6	0.4	0	0.0	7	0.2	2	2.9	15	0.3
Died	50	3.0	3	4.2	93	2.7	4	5.7	150	2.9
LTFU	16	1.0	0	0.0	24	0.7	1	1.4	41	0.8
Not evaluated	395	24.0	2	2.8	280	8.1	8	11.4	685	13.1

Table C4.3. DR-TB treatment outcomes (N=298)

	Total	
	No.	%
Cured	152	51.0
Completed treatment	57	19.1
Failure	10	3.4
Died	29	9.7
LTFU	32	10.7
Not evaluated	17	5.7
Moved to pre-XDR	1	0.3

Table C4.4. Outcomes for PLHIV on TPT (N=2,140)

	No.	%
PLHIV initiated on TPT	2,140	
PLHIV TPT completed	1426	66.6
PLHIV on TPT active TB	18	0.8
PLHIV on TPT LTFU	234	10.9
PLHIV on TPT died	29	1.4
PLHIV on TPT adverse events	11	0.5
Outcome not recorded /PLHIV on TPT unknown status	422	19.7

Table C4.5. TPT outcomes for children contacts (N=455)

	Total	
	No.	%
Initiated on TPT	455	
TPT completed	138	30.3
On TPT LTFU	33	7.3
On TPT died	0	0.0
On TPT active TB	0	0.0
On TPT adverse events	1	0.2
On TPT with other outcomes	12	2.6
Outcome not recorded or TPT status unknown	271	59.6

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