Quality of Tuberculosis Services Assessment

in the Democratic Republic of the Congo

Report

January 2024

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TB DIAH
Tuberculosis Data, Impact Assessment and Communications Hub

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Provider Interview at a TB health facility in Kinshasa, DRC. Photo Credit: Jeanne Chauffour, TB DIAH

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Version française du rapport

This report is also available in French. *Ce rapport est aussi disponible en français au lien suivant* : https://www.tbdiah.org/resources/publications/enquete-sur-la-qualite-des-services-de-tuberculose-en-rdc-rapport/

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Abbreviations

ART	antiretroviral therapy
CDT	centre de diagnostic et de traitement *(diagnostic and treatment center)*
CHA	community health actor
DOT	direct observation of treatment
DQR	data quality review
DRC	Democratic Republic of the Congo
DR-TB	drug-resistant tuberculosis
DS-TB	drug-sensitive tuberculosis
DST	drug susceptibility testing
HC	health center
HZ	health zone
INH	isoniazid
IPC	infection prevention and control
LNAC	Ligue nationale antituberculeuse antilépreuse du Congo *(national anti-TB anti-leprosy league of Congo)*
LTFU	lost to follow-up
M&E	monitoring and evaluation
MDR-TB	multidrug-resistant tuberculosis
MOCO	mobilisation communautaire *(community mobilization)*
MTB	Mycobacterium tuberculosis
mWRD	molecular World Health Organization-recommended diagnostics
NTP	National Tuberculosis Program
OAC	Organisation à assise communautaire *(community-based organization)*
PATI	Programme antituberculeux intégré aux soins de santé primaire *(Anti-Tuberculosis Program Integrated into Primary Health Care)*
PLHIV	people living with HIV
PNLT	Programme national de lutte contre la tuberculose (Congolese NTP: *National TB Control Program*)
POSAF	Pont Santé Afrique
QC/QA	quality control/quality assurance
QTSA	Quality of Tuberculosis Services Assessment

RECO	relais communautaire (*community health worker*)
RHC	reference health center
RR-TB	rifampicin-resistant tuberculosis
TB	tuberculosis
TB DIAH	Tuberculosis Data, Impact Assessment and Communications Hub
TOT	training of trainers
TPT	tuberculosis preventive therapy
TSR	treatment success rate
UN	United Nations
UNHLM	United Nations High-Level Meeting
USAID	United States Agency for International Development
WHO	World Health Organization
WPR	weekly progress report

Executive Summary

Background

The Democratic Republic of the Congo (DRC) Quality of Tuberculosis Services Assessment (QTSA) aimed to evaluate the quality of tuberculosis (TB) prevention, diagnosis, and treatment services implemented by the National TB and Leprosy program in the DRC. Efforts to monitor and improve quality of health services are of utmost value to people with TB, who are the direct beneficiaries of better-quality care. Evidence suggests that high-quality healthcare during a specific health episode may encourage people with TB to continue and complete treatment and seek care for future illnesses. Measuring and assessing quality of care demonstrates to the health system, healthcare providers and other key stakeholders, including the Ministry of Health, that quality is an important component of the program, and thus sets the bar high for improving staff performance. Finally, when an intervention to improve quality of care is complemented with the regular measurement of quality, the information that is generated can help identify trends, assess whether or not interventions are implemented as planned, identify gaps in quality, and inform future program strategies.

The DRC QTSA report provides a comprehensive overview of the state of TB services and care in the DRC, highlights both strengths and challenges in the delivery of TB services and provides key recommendations for improvement.

Methods

The DRC QTSA was a nationally representative study conducted at public sector TB diagnosis, treatment, and prevention facilities across DRC in June 2022. Two hundred and twenty-seven facilities were selected from six provinces using a stratified random sampling procedure. Four hundred and twenty-nine health facility TB staff, 489 individuals with TB receiving care at these facilities, and 473 community health actors were surveyed to provide insights on the structure, process, and outcomes of TB service delivery. Patients included in the study were individuals with pulmonary TB, ages 15 years and older, who had been on treatment long enough to be deemed non-infectious (based on the type of TB). Data were collected from the study facilities using five tools developed for the QTSA: Facility Audit, Provider Interview, Patient Interview, Community Actor Interview, and Register Review. The tools used for the DRC QTSA are available at the following link: https://www.tbdiah.org/resources/publications/quality-of-tuberculosis-services-assessment-in-congo-tools/

Results and Discussion

Patient Satisfaction: The assessment revealed a high level of patient satisfaction with TB services, with 85 percent of individuals with TB receiving services at the sampled health facilities overall reporting that they were either satisfied or highly satisfied with the services they received. The reported satisfaction level was higher for individuals with drug-susceptible TB (DS-TB) (92%) compared to individuals with drug-resistant TB (DR-TB) (85%) who have a longer and more difficult treatment. However, there may have been courtesy bias in reported patient satisfaction as interviews were conducted at healthcare facilities.

Care-Seeking Behavior, Diagnosis, and Treatment Initiation: Approximately 64 percent of individuals with TB receiving care at the health facilities sampled in the assessment waited over two weeks after experiencing symptoms before seeking care. However, 69 percent received test results confirming TB within two days, and 79 percent initiated treatment within two days of diagnosis. These figures demonstrate effective diagnostic and treatment initiation processes.

Treatment Outcomes: For individuals with DS-TB receiving services at the health facilities sampled, the treatment success rate was 94 percent, with 53 percent cured. In contrast, those with DR-TB had a lower treatment success rate of 77 percent, with a cure rate of 45 percent.

Human Resources: Among the healthcare providers interviewed, approximately 45 percent were older than 45 years old.

Access and Infrastructure: Accessing healthcare facilities in remote areas was difficult due to poor roads and security concerns. Infrastructure issues, including a lack of electricity and diagnostic equipment, were prevalent.

Person-Centered Care: The current TB services did not adequately prioritize person-centered care, highlighting the need for improving patient-provider interactions and provider training.

Recommendations and Conclusion

The report offers recommendations in eleven categories, including standardizing data reporting, strengthening medical training programs, decentralizing skill strengthening efforts, improving people with TB knowledge, enforcing laboratory protocols, ensuring equipment availability, and promoting person-centered care. Additionally, addressing gender disparities in the medical field and enhancing treatment follow-up and coordination among partners are essential.

The DRC QTSA results indicate both strengths and weaknesses in the quality of TB services. These findings provide valuable insights into key areas that the National TB Program should focus on to enhance the availability and quality of TB care services in the DRC. The data from this assessment are already being used to develop a new national strategic plan for TB and to inform the Global Fund grants applications, demonstrating the practical impact of this assessment on TB care in the country.

Introduction

Background

Tuberculosis (TB) is a communicable disease, one of the top 10 causes of morbidity and mortality worldwide. Before the COVID-19 pandemic hit, TB was the leading cause of death from a single infectious agent (World Health Organization [WHO], 2023). At the time of data analysis in this report, an estimated 10.6 million people developed TB and 1.4 million died from it globally (WHO, 2022). Although Mycobacterium tuberculosis (*M. tb*) can infect anyone anywhere, TB is a disease of poverty, predominantly afflicting the world's poor. Thirty high-burden TB countries account for 87 percent of those who fall sick with TB each year (WHO, 2022).

TB is a preventable and curable disease. About 86 percent of people who develop TB can be successfully treated with a four- to six-month drug regimen, and treatment has the additional benefit of curtailing onward transmission of infection (WHO, 2022). Since 2000, TB treatment has averted more than 67 million deaths (WHO, 2022).

The emergence and rapid spread of multidrug-resistant tuberculosis (MDR-TB) is a growing health security concern that is also contributing to antimicrobial resistance and the reversal of two decades of progress in mitigating the impact of TB. Globally in 2021, there were an estimated 450,000 new cases of MDR-TB/rifampicin-resistant tuberculosis (RR-TB); 3.6 percent of new TB cases and 18 percent of previously treated cases had MDR-TB or RR-TB (WHO, 2022).

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 also address TB, especially Sustainable Development Goal 3 ("Ensure healthy lives and promote well-being for all at all ages"), which specifies that the TB epidemic should be ended by 2030 (UN, 2015). Although these global initiatives and downstream country actions resulted in a decreased TB burden in many countries, the decline in incidence was slower than needed 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, through which countries reaffirmed their commitment 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 (TPT) 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). Unfortunately, initiatives and actions to reach these targets were considerably waylaid by the global COVID-19 pandemic of 2020–2023.

The United States Agency for International Development's (USAID) Global Accelerator to End TB, which was launched at the UNHLM, is an initiative and business model aimed to assist high TB burden countries attain UNHLM targets by accelerating proven anti-TB strategies and helping countries develop programs to achieve an accountable, responsible, and inclusive TB response (USAID, n.d.). To strengthen the knowledge base for systematic methods to measure and monitor TB quality of care and improve data on the quality of TB services across the high-burden countries, USAID charged the MEASURE Evaluation project, and its successor, the Tuberculosis Data, Impact Assessment and Communications Hub (TB DIAH) project, to develop standardized tools to assess the quality of TB services and conduct a series of quality of TB services assessments (QTSAs) to establish baselines for the examination and improvement of TB service quality.

This report describes the findings of a 2022 QTSA that was conducted by TB DIAH in the Democratic Republic of the Congo (DRC), in collaboration with the National Tuberculosis Program (NTP), referred to locally as Programme national de lutte contre la tuberculose (PNLT).

Tuberculosis in the DRC

The DRC has a significant burden of TB, with an estimated TB incidence rate of 318 per 100,000 (WHO, 2021). Among the 30 high-burden TB countries that accounted for 87 percent of all estimated incident cases worldwide, eight of them accounted for more than two-thirds of the global total, including the DRC, which accounted for nearly 3 percent of the global total (WHO, 2022). The DRC is one among just 10 countries that the WHO has classified as having a high burden of TB, TB/HIV co-infection, and MDR-TB/RR-TB (WHO, 2022).

In 2021, the country reported a total of 214,408 new and relapse cases, and cases with unknown previous TB treatment, of which more than 22,000 were children younger than 15 years of age (WHO, 2021). The evidence of high prevalence of TB across age groups demonstrates that transmission is still widespread despite implementation of the End TB Strategy.

Despite nearly doubling its case notification of people newly diagnosed with TB between 2015 and 2021, the TB detection gap has persisted over the past 10 years with almost 90,000 cases missing in 2021 (WHO, 2022). The country ranked tenth worldwide for the size of the gap between notified cases and estimated TB incidence (WHO, 2022).

In 2021, the national treatment coverage rate was 70 percent, the treatment success rate (TSR) was 94 percent (for the 2020 cohort), and the case fatality ratio was 17 percent (WHO, 2021). Antiretroviral therapy (ART) coverage for TB/HIV coinfected individuals was high: 82 percent of HIV-positive people with TB were on ART (WHO, 2021).

According to the most recent estimates of drug resistant TB, 1.6 percent of new cases and 20 percent of previously treated cases were MDR-TB/RR-TB cases (WHO, 2021). The DRC is one of the 10 countries that account for about 70 percent of the global gap between the estimated global incidence of MDR-TB/RR-TB each year and the number of people enrolled in treatment (WHO, 2022).

These data highlight important gaps and the need for improved diagnosis, laboratory services, prevention, and treatment, and the importance of addressing the broader health system challenges that contribute to poor quality of care.

The advent of the COVID-19 pandemic further complicated TB care in the DRC, significantly impacting TB service delivery, with disruptions to laboratory services and a decrease in patient visits to health facilities. These disruptions have the potential to further exacerbate the quality of TB care in the DRC.

NTP TB Strategy and National Programmatic Response to TB

The PNLT is committed to accelerating the fight to end the TB epidemic by 2035 and has endorsed the global "End TB by 2035" strategy.

The national programmatic response to TB began with the establishment of the PNLT more than 30 years ago, the integration of the TB mitigation strategy in primary healthcare, and the development of the national TB program guidelines called PATI (*Programme antituberculeux intégré aux soins de santé primaire* [Anti-Tuberculosis Program Integrated into Primary Health Care]), which is now in its sixth edition (Ministère de la santé and PNLT, 2022). The strategy calls for active TB case finding and rapid diagnostic technologies to reduce the gap in missed cases and the threat of increasing drug-resistant (DR-TB) cases.

Administratively, DRC is divided into 26 provinces. While the PNLT coordinates TB activities at the national level, implementation of activities at the provincial level is led by the respective provincial offices. Provinces are composed of health zones (HZ). The organization of TB services in the HZ is as follows:

- The diagnostic and treatment center (*centre de diagnostic et de traitement*, or CDT) is the functional unit of the PNLT where people with TB are diagnosed and subsequently treated. It is usually either a health center (HC) or a general reference hospital and has supplies and equipment for diagnosing TB (e.g., molecular WHO-recommended diagnostics [mWRD]) as well as therapeutic services.
- Satellite structures associated with CDTs called *sanitaires* identify individuals who meet the PNLT criteria for presumptive TB and ensure the collection and dispatch of specimens. They screen for but do not diagnose TB and are responsible for monitoring the continuity of treatment and care for people with TB treated at the CDT.

The PNLT recommends that a CDT serve a population of 50,000, but this number may be lower depending on the circumstances (e.g., population density, geographic accessibility, population travel distances). The CDT must be equipped with diagnostic tools (e.g., mWRD, such as GeneXpert MTB/RIF or Truenat MTB and their respective reagents), have trained and regularly supervised staff and have the proper data collection tools.

Both public and private sector health facilities are included in the TB strategy, either as CDTs or as treatment centers. Furthermore, the PNLT's broader strategy also includes a community-based TB component. Community workers are responsible for identifying individuals with presumptive TB and referring them to HCs for diagnosis, providing treatment support, including directly observed treatment (DOT), retrieving people with TB who are lost to follow up, and implementing contact investigation.

Despite implementation of the TB strategy, the PNLT still faces numerous challenges, including underreporting of drug-susceptible-TB (DS-TB), DR-TB, and pediatric TB; increased mortality among vulnerable populations; and high rates of TB/HIV coinfection (Ministère de la santé and PNLT, 2015).

To address these challenges, the PNLT needs to intensify efforts to improve TB service coverage and quality of services, including optimizing the use of mWRD such as GeneXpert and TrueNat, and ramping up efforts to prevent TB, including provision of TPT for eligible individuals such as close contacts. Furthermore, intensifying actions to support special and vulnerable groups,[1] involving community health actors (CHAs), training service providers, and scaling up tools that can strengthen TB diagnosis in children should be prioritized to improve TB case detection. Last, but not least, there is a need to address human rights issues that hinder access of certain populations to TB services.

QTSA

Early and accurate detection and appropriate treatment of people with active TB disease are pivotal strategies employed by NTPs in high-burden TB countries. In addition to expanding access to services, TB programs are implementing efforts to improve the quality of diagnosis, care, and treatment, and recognizing the important role that quality of care plays in improving case detection and TSRs. An article by Kruk, et al. for the Lancet Global Health Commission on "High Quality Health Systems in the Sustainable Development Goals Era" estimated that 60 percent of deaths from conditions amenable to healthcare are due to poor quality care, whereas the remaining 40 percent resulted from the non-use of the health system (Kruk, et al., 2018). Such data demonstrate that what happens after people with TB have accessed the health system, and whether they are provided the services they need in a competent and caring manner, are equally important, if not more important than access to the services (Kruk, et al., 2018; Arsenault, Roder-DeWan, Kruk, 2019).

Improving the standard of TB care ensures that people with TB receive the care they deserve, and by doing so, encourages more people with TB to seek services in a timely manner. The *International Standards for Tuberculosis Care* describes a widely accepted level of care that all healthcare providers—public and private—should strive to achieve when treating and managing people with TB, are presumed to have TB, or are at an increased risk of developing TB (TB CARE I, 2014). These standards are intended to promote the engagement of all providers in delivering high-quality care to people with TB of all ages, and to empower people with TB to evaluate the quality of care they receive from healthcare providers. The standards offer a reference point to assess healthcare provider performance and quality of care and help identify current and expected levels of quality in healthcare delivery. Failure of providers or systems to adhere to the defined standards of diagnosis, care, and treatment of TB compromises the quality of services provided to people with TB.

[1] The PNLT defines special and vulnerable groups as: TB contacts, people living with HIV (PLHIV), prisoners, miners, refugees/conflict-displaced persons, healthcare workers, military and police, diabetics, cross-border commuters, street children and orphans, indigenous peoples, drug users (especially intravenous drugs) and tobacco smokers, sex workers, men who have sex with men, transgender people, and people living in university and boarding school settings (PNLT, 2015).

The *International Standards for Tuberculosis Care* are useful in guiding service providers to offer high-quality TB services, however, there are almost no tools or guidelines available for NTPs and other TB stakeholders to use to assess and monitor the quality of TB services at a programmatic level. The QTSA was designed to fill this methodological and knowledge gap.

The QTSA is a facility-based survey, like the Demographic and Health Survey and the Service Provision Assessment,[2] but specifically designed to assess the quality of TB services. QTSA resources include implementation guidelines and a set of standardized tools that employ several data collection methods (i.e. review of facility-based TB registers, interviews with healthcare providers, and patient interviews), to collect information that is used to generate indicators to assess and monitor the quality of TB services provided by the NTP.

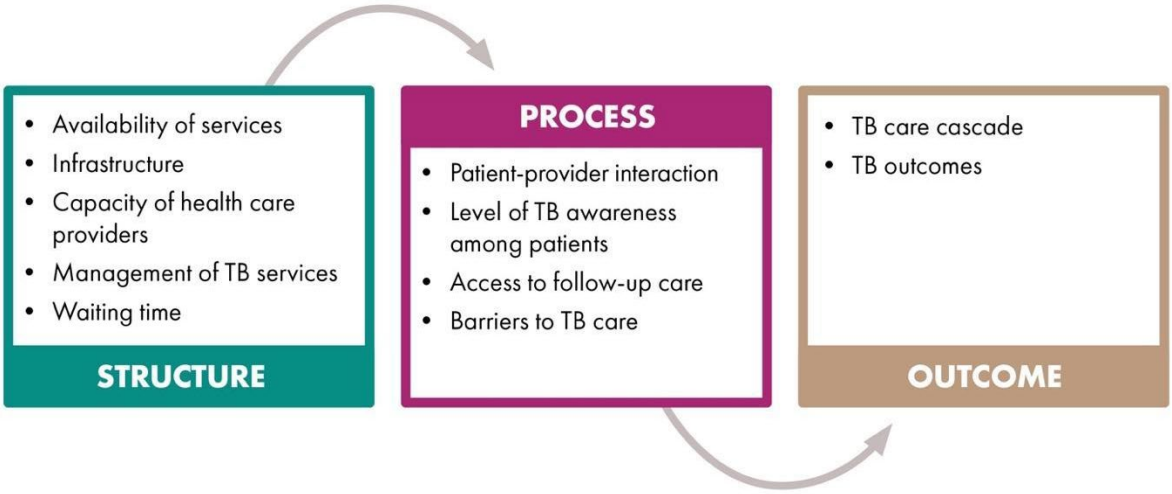
Conceptual Framework

There is growing evidence that quality of care is linked to health outcomes, and that targeted improvement in quality of care can enhance the use of TB services and, ultimately, improve TB outcomes over the long-term. However, 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 (Cazabon, et al., 2017). In this context, a framework and standards that can guide NTPs and other TB stakeholders to systematically measure and improve the quality of TB services is useful and fills an important knowledge gap.

The QTSA TB Quality of Care Framework, presented in Figure 1 and used to guide the QTSA in the DRC, illustrates a logical pathway that identifies and links the key components of high-quality TB care. The three components are: *structure,* or the resources available at a health facility, or more generally in the healthcare system; *process,* or the interaction between the healthcare system, including providers and patients; and *outcomes,* or the consequences of care (Donabedian, 2005). These components must be present and function properly to achieve desired TB outcomes.

[2] The Service Provision Assessment survey is a health facility assessment that provides a comprehensive overview of a country's health service delivery. For more information on the Service Provision Assessment, visit https://dhsprogram.com/methodology/Survey-Types/SPA.cfm

Figure 1. TB quality of care framework



Source: MEASURE Evaluation, adapted from Donabedian, 2005

This framework can be used to define and measure the key elements in each component, which together can generate information that policymakers and program managers can use to inform their analysis and decision making to improve the quality of TB services. The three components and elements of TB quality of care are described below.

Structure

Structure refers to the foundational elements and the environmental factors that facilitate or hinder the provision of high-quality TB services at the health facility level. This includes the physical infrastructure of the health facility; the availability and organization of specific TB services, as determined by the health facility type and level; the availability of and adherence to national TB standards and guidelines; appropriate human resources to provide services offered; staff training and competencies; the availability of drugs, medical equipment, and other supplies; adequate management and supervision structures and systems; and resources and funding for social support, such as payment schemes, incentives, and transportation reimbursement, to facilitate the delivery and receipt of TB services.

Process

Process refers to the steps and manner in which services and care are provided to people with TB visiting the health facility. It puts a spotlight on the interaction between TB service providers and patients, from both perspectives, during the delivery of services and the caregiving process. In other words, process qualifies “what is done” with “how it is done”. Process also refers to provider-focused procedures and events, such as supervision and training, that also affect their competence and behavior and have a downstream effect on people with TB health outcomes.

Outcome

Outcome refers to the results and effects of care. Outcomes are measured in terms of TB and related health outcomes and patient satisfaction. Depending on data needs, cases diagnosed and

notified can be disaggregated by multiple factors, including TB type (new, retreatment), site of disease (pulmonary, extrapulmonary), drug resistance status, HIV status, and sex and age group, to gain a better understanding of the types of people with TB accessing (and not accessing) TB services. Treatment outcomes, including treatment completion, cure, failure, loss to follow-up, and death while on TB treatment, provide insights on the NTP's ability to provide successful treatment services. Assessing patients' satisfaction or their reaction and responsiveness to the care provided by the healthcare system is a key aspect of assessing quality of care because it provides further insights on their subsequent health and care-seeking behavior.

Study Purpose and Objectives

Purpose

In the DRC, the PNLT wanted to assess the quality of TB services concurrently with the quality of TB data. Therefore, in 2022 a joint QTSA and data quality review (DQR) activity was planned and conducted to assess the quality of TB services and TB data quality in a random sample of TB diagnosis and treatment facilities in the country.

Although this technical report will focus on presenting the results of the QTSA, the objectives of the joint QTSA and DQR activity are presented below.

Objectives

The objectives of the QTSA and DQR study were to:

- Determine the availability of TB services (i.e., screening, diagnosis, treatment, care and follow-up, laboratory services).
- Assess the availability of facility infrastructure (as well as maintenance), skilled providers, commodities, and organizational structures that support TB service delivery.
- Assess TB providers' knowledge, skills, and ability to deliver appropriate TB services.
- Assess patient satisfaction with TB services.
- Examine the linkages among TB diagnosis, treatment initiation, and treatment outcomes.
- Assess the components and functionality of the TB information system to generate high-quality TB data. *(This objective was specific to the DQR and is further discussed in the DQR report.)*
- Review and validate indicator data for selected TB indicators for a specific reporting period. *(This objective was specific to the DQR and is further discussed in the DQR report.)*

DQR

The DQR was administered by the same data collection teams and at the same health facilities as were the QTSA tools and was conducted using the DQR method. The method and results from the DQR are presented in a separate report available here: https://www.tbdiah.org/resources/publications/tuberculosis-dqr-in-drc-report/

Methods

Study Design

The QTSA is a cross-sectional study that was conducted at 227 TB diagnostic and treatment facilities (both public and private sector) in the DRC. The results are representative at the national level.

Using a facility audit alongside provider and patient interviews, the study examined the availability and functionality of material and human resources at facilities, TB service providers' competencies and skills, the interactions between providers and TB patients, and patients' perception of TB services to evaluate the overall quality of TB services. Additionally, a review of registers for a specific period of time was conducted to assess the diagnosis and treatment outcomes of TB patients who had completed treatment. In the DRC, outcomes of DS-TB and DR-TB patients who completed treatment between January 1 and March 31, 2021, were reviewed.

A noteworthy aspect of the QTSA method is the thorough examination of the views and perceptions of people with TB in the evaluation of quality of services. We know that people with TB shun poor quality services despite proximity to those services. Thus, if people with TB perceive the quality of services to be good, logically we will see improvements downstream, namely in service utilization, treatment adherence and treatment outcomes.

Sampling Procedure and Sample

Overall, 229 health facilities were randomly selected using a multistage sampling procedure to achieve a nationally representative sample. Of the 229 facilities, 227[3] were included in the survey.

Due to recent migration of the NTP's information system to a new platform, data on TB case notification was incomplete and could not be used to stratify provinces and HZs. Therefore, TB treatment success was used in combination with data on case notification to identify and rank provinces. Provinces were then sorted and categorized based on these two variables into three strata (high, medium, and low) from which they could be randomly selected. Two provinces were randomly selected from each stratum for a total of six provinces out of 26 across the country (Figure 2).

In the second stage of HZ selection, the same method was used to identify and rank HZs in the selected provinces based on TB case notification and TSRs. Seven to 10 HZs were randomly selected from each province. The number of HZs varied based on the number of facilities required for the sample. Overall, 51 total HZs were selected.

The following six provinces and zones were sampled for the QTSA in the DRC:

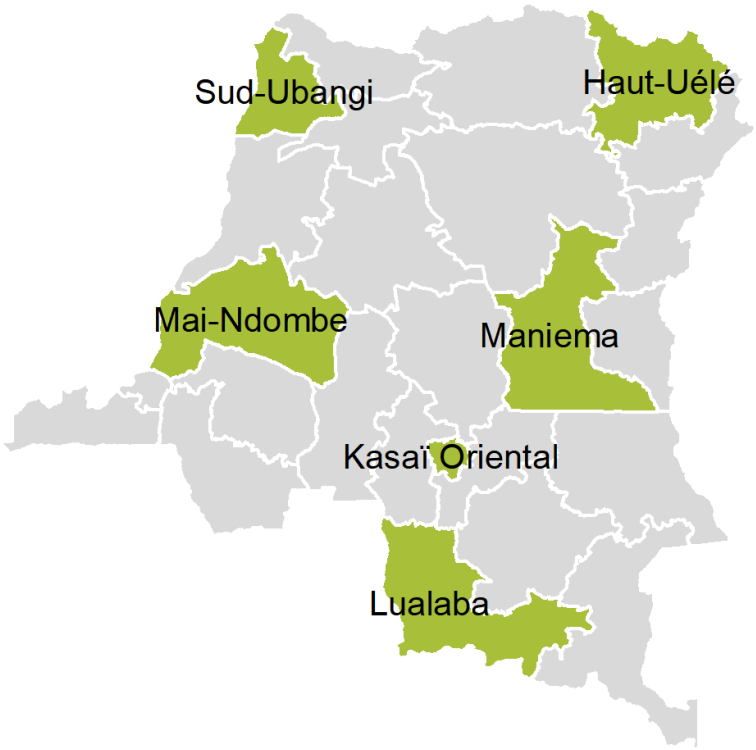
- Haut-Uélé (HZs: Dungu, Isiro, Makoro, Niangara, Pawa, Rungu, and Watsa)

[3] Two facilities were dropped from the original sample because it was subsequently determined that they did not provide TB services during the period of interest for the study.

- Kasaï-Oriental (HZs: Bipemba, Bonzola, Diulu, Kabeya Kamwanga, Kansele, Lukelenge, Miabi, Muya, Nzaba, Tshishimbi)
- Lualaba (HZs: Bunkeya, Dilala, Dilolo, Fungurume, Kanzenze, Kasaji, Lubudi, and Mutshatsha)
- Maï-Ndombe (HZs: Bokoro, Bolobo, Mimia, Mushie, Ntandembelo, Oshwe, and Yumbi)
- Maniema (HZs: Alunguli, Kalima, Kampene, Kasongo, Kibombo, Kunda, Lubutu, Lusangi, Obokote, and Tunda)
- Sud-Ubangi (HZs: Bangabola, Bokonzi, Bominenge, Bulu, Kungu, Mawuya, Ndage, Tandala, and Zongo)

In the third stage, all health facilities (i.e., a census) were selected given the small number of health facilities per HZ.

Figure 2. Map of provinces selected for the DRC QTSA



Service Providers

A total of 429 TB service providers delivering TB services at the sampled health facilities on the day of data collection were included in the study. The staff in charge of TB and TB-related services were also interviewed to see if there was more than one person delivering TB services. Each provider was individually administered a Provider Interview. In general, at small facilities, one or two staff delivering TB services were asked to respond to the Provider Interview. At larger sites, three or four providers among those present were randomly selected for the Provider Interview.

TB Patients

A total of 489 individuals with TB receiving services at the health facilities assessed were included in the study. The data collectors purposively selected a consecutive sample of three to five confirmed TB patients who were already on treatment and visiting the health facility on the day of data collection. If no (or insufficient) eligible patients were present at the health facility, they were called upon by health providers to come to the facility while the data collection team was present.

The patient inclusion criteria were as follows:

- Patients ages 15 or older
- Patients with pulmonary TB
- DS-TB patients who have been on treatment for at least two weeks or deemed not infectious
- DR-TB patients who have been on treatment for 6–8 months or are known culture converted

The patient exclusion criteria were as follows:

- DS-TB patients who have received less than two weeks of treatment
- Patients visiting the facility for the first time
- Patients who are too weak to participate
- Patients who refuse to be interviewed
- Patients under age 15
- Patients who are transferred-in and have spent less than one month receiving care at the facility

CHAs

CHAs who were present at the facility on the day of data collection were interviewed. Data collection teams notified facilities in advance of their arrival to increase the likelihood of a CHA being present. If none were present, service providers contacted CHAs to see if any were available for an interview. At least one CHA was interviewed per facility. The CHAs were administered the Community Actor Interviews and are separate and unique from the sample of health providers who were administered the Provider Interviews.

Individuals considered CHAs were any individuals identifying with the title of relais communautaire (RECO) or belonging to any of the following associations: Mobilisation communautaire (MOCO), Club des Amis Damien (CAD), Organisation à assise communautaire (OAC), or Ligue nationale antituberculeuse antilépreuse du Congo (LNAC). Most CHAs are unpaid volunteers, but it is possible for certain groups to pay their members.

Data Collection Instruments

The following QTSA tools were used to collect the required data:

Facility Audit: The Facility Audit was administered to the health facility in-charge, TB focal person, and other service providers engaged in the provision of TB services at the facility to determine the availability and functionality of the facility infrastructure, TB services offered, and equipment and resources available to serve people with TB with quality TB care. One Facility Audit was conducted at each sampled health facility.

Provider Interview: The Provider Interview was administered to service providers actively engaged in the provision of TB services, such as the TB focal person and/or other staff in charge of specific TB-related services, to understand the clinical processes and protocols applied during TB counseling, screening and diagnosis, treatment, and follow-up care. This tool evaluates the technical competence, knowledge, and practices of the service providers in the provision of clinical care and management of TB services. One or more Provider Interview(s) were conducted at each sampled health facility depending on the facility size, typically ranging from one to four interviews.

Patient Interview: The Patient Interview was administered to people with TB receiving diagnosis and treatment services at the facility to collect information about the client's experience as the recipient of care. This tool includes questions to assess the patient's perspective of the quality of TB-related services offered by the facility. One or more Patient Interview(s) were conducted at each sampled health facility depending on the facility size and patient load, typically ranging from one to five interviews.

Register Review: The Register Review involves the review and extraction of relevant TB data from the appropriate registers (e.g., laboratory registers, TB treatment registers, DR-TB treatment register, TB contact register) for a specific period of time to assess the services provided to TB patients and TB-related outcomes. One Register Review was conducted at each sampled health facility.

Community Actor Interview: In the DRC, the Community Actor Interview was developed in addition to the four standard QTSA tools listed above. This was administered to CHAs involved in the care of people with TB at the sampled health facilities. It provides data on the CHAs' perspectives of the quality of TB-related services offered by the facility and providers and the quality of community care available in the catchment area. One or more Community Actor Interview(s) was conducted at each sampled health facility depending on the facility size and patient load, typically ranging from one to five interviews.

The six tools used in the DRC for the joint QTSA-DQR can be found at https://www.tbdiah.org/resources/publications/quality-of-tuberculosis-services-assessment-in-congo-tools/

Survey Implementation

Selection of a Local Research Organization

TB DIAH selected Pont Santé Afrique (POSAF) as the local research organization charged with field implementation of the DRC QTSA/DQR in 2021 after a fair and open selection process. TB DIAH and POSAF worked closely throughout the entirety of the study.

Tool Adaptation

The standard QTSA tools were first translated into French by TB DIAH with support from a local consultant in the DRC. Then POSAF assembled a QTSA/DQR Steering Committee and led the adaptation of the QTSA/DQR tools to the DRC context. The customization of the tools took place in January and February 2022.

Pretest

The DRC QTSA/DQR tools were pretested in Kinshasa over a seven-day period in January 2022. The objective of the pretest was to verify that the questions were relevant and understood by respondents in the intended way, that the response options were comprehensive and appropriate, and that the sequencing of the questions was conducive to smooth data collection. To achieve this objective each tool was administered multiple times during the course of the pretest and improved iteratively after each administration.

The pretest team consisted of TB DIAH, POSAF, PNLT staff, QTSA/DQR steering committee members, and a selection of potential data collection team leads who were hired for the pretest as a way to assess their data collection and leadership skills.

The seven facilities that participated in the pretest were located in four HZs across Kinshasa. In eastern Kinshasa, four CDTs (Elonga, Lunda, Kikimi, Maréchal) located in two HZs (Masina II, Kikimi) participated. In central Kinshasa, one CDT (Libikisi) from Bandalungwa HZ participated. In western Kinshasa, two CDTs (Libondi, Siloé) from Bumbu HZ participated.

The changes made to each tool were mainly related to rewording some questions and answer options, making certain questions/answers more specific, and reorganizing the order of certain questions. All changes were reflected in both the English and French versions of the tools.

Training of Trainers

The training of trainers (TOT) for the collection of field data for the DRC QTSA was organized in Kinshasa over the course of nine days in late March 2022. The overall objective of the TOT was for QTSA provincial field supervisors to become proficient with the QTSA protocol, method, and tools, including the use of SurveyCTO for electronic data collection. Additionally, the TOT was intended to ensure the field supervisors could be responsible and capable of training, supervising, and leading their data collection teams.

The TOT included two field practice days, but was otherwise focused on didactic reading, review, and comprehension of the tools, practice using the tablets, role-play, and preparing logistics for the field work.

Training of Data Collectors

Two data collection teams were assigned to each of the six study provinces. Data collectors were selected from within each province following a competitive selection process, to guarantee knowledge of the geography, local customs, and local languages. Two data collection team supervisors for each province, with support from either a POSAF, PNLT, or QTSA/DQR steering committee staff member, organized and facilitated six provincial training workshops in late April 2022. Each workshop trained 10 data collectors (four data collectors per team, with one substitute for each team participating in the training).

In addition to training the data collectors, team members from POSAF, PNLT and the steering committee were responsible for facilitating contact with local authorities and coordinating the team leaders in the organization of the training, including identifying facilities not sampled in the QTSA where data collectors could practice administering the tools.

Data Collection and Management

Each province had a deployment plan, developed by the data collection teams and reviewed by POSAF prior to the teams' departure. The POSAF monitoring and evaluation (M&E) team monitored the deployment and movement of the field teams on a daily basis throughout the entire duration of data collection. The POSAF administration, finance, and logistics team also conducted daily monitoring and made recommendations for changes to improve logistics and the efficiency of field activities whenever necessary. Before team supervisors were deployed to the provinces, the POSAF communications team set up a communication system (telephone contacts, emails, and WhatsApp groups) allowing daily and effective liaison with the central POSAF team. Team supervisors also organized themselves to create WhatsApp groups by province to allow smooth coordination.

All local administrative and facility management authorities were informed either before the departure of the field teams from Kinshasa or upon their arrival in the provinces, and authorizations to access health facilities were obtained before the departure of the field teams from Kinshasa. Each data collection team traveled with printed copies of the tools and a system was set up for the team leads to access cash to pay for the teams' expenses over the course of the data collection period.

Data were collected electronically on tablets using SurveyCTO in the scheduled CDT, with each team interviewing at least one provider, and three patients and CHAs per facility. This method of data collection allowed for real-time data management through the use of data limits, skip logic, and required responses as the tools were being administered. Data were uploaded daily on TB DIAH's server.

In terms of meeting the objectives set, the results were very satisfactory:

- The Facility Audit was administered at 99 percent of the sites (227 planned facilities versus 229 expected).
- The Provider Interview was administered to 94 percent of the target (430 interviews versus 458 expected), representing an average of 2 Provider Interviews per facility.
- The Patient Interview was administered to 115 percent of the target (527 interviews versus 458 expected), representing an average of 2 Patient Interviews per facility.

- The Community Actor Interview was administered to 104 percent of the target (476 interviews versus 458 expected), representing an average of 2 Community Actor Interviews per facility.
- The Register Review was administered at 99 percent of the sites (227 planned facilities versus 229 expected).

Although it was very challenging for the data collection teams to reach certain facilities, they were able to visit 227 of the sampled 229 facilities within eight weeks. The two facilities that were not visited were in the Maï-Ndombe province. They were dropped from the sample because it was discovered that they had been miscategorized as CDTs and therefore were not eligible for the QTSA/DQR.

Informed consent was obtained from all participants before administering the tools. Once the data was captured electronically, 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 POSAF. 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.

Data Analysis

After the completion of data cleaning, and the finalization and locking of the data set, data analysis was performed using STATA v14 software. The preliminary findings from the assessment were presented in Kinshasa in November 2022 at a data validation and consensus meeting that assembled POSAF staff, PNLT leadership, QTSA/DQR steering committee members, TB stakeholders, and two TB DIAH staff. The purpose of the meeting was to validate the study results and discuss 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 PNLT. Feedback from stakeholders helped TB DIAH to finalize the analysis.

Disaggregation of the variables in the QTSA tools is reported in the Results section of this document. The recommendations from the data consensus meeting are presented in the Recommendations section of this report.

Ethical Review

The study was conducted following approval by both the John Snow, Inc. (JSI) ethical committee and the School of Public Health of Kinshasa (Ecole de santé publique de Kinshasa) in the DRC.

Results

This section presents the DRC QTSA findings, organized according to the QTSA conceptual framework and the data needs prioritized by the NTP. After a brief description of the characteristics of the health facilities, TB service providers, patients, and CHAs sampled, the findings on the structure-, process-, and outcome-related indicators are presented. When appropriate, the findings are stratified by the level of health facility (reference health center [RHC], hospital, etc.) and the location of the facility (urban, rural, peri-urban). Additional data are provided in tables in Appendix C.

1. Sample Characteristics

1.1. Facilities

In total, 227 health facilities were included in this assessment. About half (49.3%) were HCs at the primary level, followed by RHCs (18.9%) at the secondary level, and hospitals/hospital centers/clinics (31.7%) at the tertiary level (Table 1). About three-quarters of the facilities were located in rural areas, 18.1 percent were located in urban areas, and 7.5 percent were located in peri-urban areas. Most health facilities (61.7%) were managed by the government or public sector, and the remaining facilities were managed by mission or faith-based organizations, private for-profit organizations, military or paramilitary organizations, or some other entity (data not shown). Three-quarters of the sampled facilities offered both inpatient and outpatient services (data not shown).

Table 1. DRC QTSA facility characteristics

Facility Type	Facility Location						Total	
	Urban		Peri-urban		Rural			
	No.	%	No.	%	No.	%	No.	%
Hospital/hospital center/clinic	14	34.1	6	35.3	52	30.8	72	31.7
RHC	0	0	0	0	43	25.4	43	18.9
HC	27	65.9	11	64.7	74	43.8	112	49.3
Total	**41**	**100**	**17**	**100**	**169**	**100**	**227**	**100**

1.2. Staffing

Each facility in the assessment was asked to report the overall number of full-time and part-time staff at the facility, and the number of staff dedicated to TB (Table 2a). There was little variation in the median number of full-time TB clinical staff among the facility types and facility locations. However, it should be noted that the ranges for each of the facility types and locations varied greatly.

Table 2a. Health facility staffing

		Facility Type			Facility Location			All Facilities (n=429)
		Hospital (Tertiary)	RHC (Secondar	HC (Primy)	Urban	Peri-urbn	Rural	
All clinical staff	Median	49.5	17	9	10	17	15	14
	Range	[3–340]	[6–56]	[3–80]	[3–94]	[6–140]	[3–340]	[3–340]
Full-time TB clinical staff	Median	3	3	3	2	3	3	3
	Range	[1–112]	[0–10]	[0–22]	[1–27]	[2–11]	[0–112]	[0–112]
Part-time TB clinical staff	Median	2	0	1	2	1	1	1
	Range	[0–91]	[0–8]	[0–5]	[0–21]	[0–5]	[0–91]	[0–91]

1.3. Providers

A total of 429 healthcare providers (81% male and 19% female) were interviewed for the assessment (Table 2b).

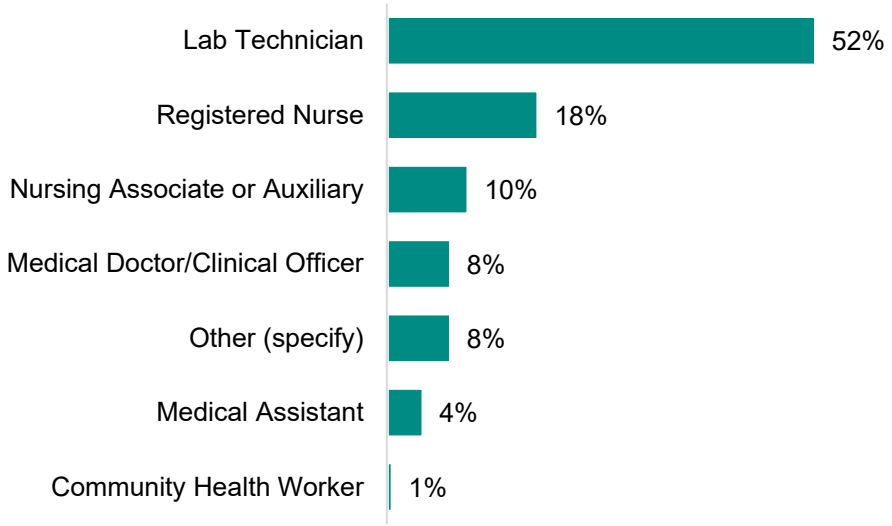
Table 2b. Healthcare provider demographic characteristics

(n=429)	No.	%
Provider sex		
Male	347	80.9
Female	82	19.1
Provider age		
18–24	8	1.9
25–34	70	16.3
35–44	158	36.7
45–54	124	28.9
55+	69	16.2

Among the providers interviewed, 66 percent reported that they were the TB focal point or designated TB staff at their facility. Approximately half of those interviewed (51.5%) described their current role as lab technician at the facility and 18.2 percent worked as registered nurses (Figure 3), and 66 percent of all providers interviewed stated working directly with patients. The large representation of lab technicians is explained by the fact that 74.2 percent of lab technicians are the designated TB staff at their facility, 78.7 percent are the manager or in-charge for clinical services, and they see or provide care for an average of 13.7 TB patients per week. Forty-seven of the lab technicians were at HCs, and only four out of the 221 lab

technicians interviewed did not see any TB patients in a typical week. About 60 percent of those interviewed had completed their A1 or A2 schooling levels, and 28 percent had received either a graduate, postgraduate, or doctoral degree (data not shown). The majority (98.1%) were at least 25 years old. Nearly all providers (85.6%) reported working 41 hours or more per week at the facility (data not shown).

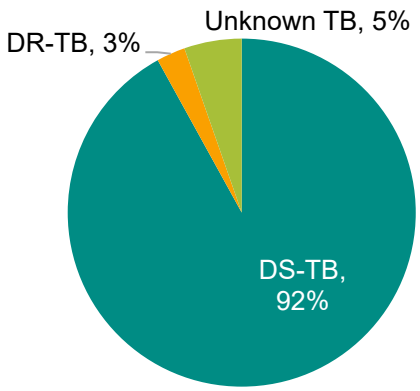
Figure 3. TB healthcare provider occupation (n=429)



1.4. Patients

Five hundred and twenty-four (524) patients were initially screened for the patient interview. Nearly all (92%) reported having DS-TB, 2.7 percent reported having DR-TB, and 5.3 percent did not know the type of TB they had (Figure 4).

Figure 4. TB patients, by self-reported TB diagnosis (n=524)



Subsequent analyses are restricted to the 489 patients who reported whether or not they had DR-TB or DS-TB. A little more than half (54.6%) of all patients stated that they were in the intensive phase of treatment and 41.3 percent were in the continuation phase; 3.7 percent did

not know what treatment phase they were in (data not shown). The characteristics of the patients interviewed are detailed in Table 3 below.

Table 3. Characteristics of patients interviewed, by type of TB

	Type of TB				Total	
	DS-TB		DR-TB			
	No.	%	No.	%	No.	%
Sex (n=489)						
Male	292	61.3	12	92.3	304	62.2
Female	183	38.4	1	7.7	184	37.6
Other	1	0.2	0	0	1	0.2
Age (n=483)						
18–24	53	11.1	0	0	53	10.8
25–34	90	18.9	3	23.1	93	19
35–44	134	28.2	3	23.1	137	28
45–54	90	18.9	2	15.4	92	18.8
55+	103	21.6	5	38.5	108	22.1
Highest education completed (n=489)						
No education	50	10.5	0	0	50	10.2
Primary education	184	38.7	6	46.2	190	38.8
Secondary education	228	47.9	7	53.8	235	48.1
Postsecondary education	14	2.9	0	0	14	2.9
Living setting (n=488)						
Urban	107	22.5	5	38.5	112	22.9
Peri-urban	31	6.5	1	7.7	32	6.5
Rural	338	71.0	6	46.2	344	70.3
Transportation used to reach facility* (n=489)						
Bicycle	39	8.2	1	7.7	40	7.4
Bus	4	0.8	0	0.0	4	0.7
Motorcycle (personal)	17	3.6	1	7.7	18	3.3
Taxi	9	1.9	0	0.0	9	1.7
Moto taxi	57	12.0	3	23.1	60	11.1
Walking	395	83.0	8	61.5	403	74.8
Other	4	0.8	1	7.7	5	0.9

Note: Only patients who knew whether they had DS-TB or DR-TB were accounted for in these totals (patients who responded “do not know” were excluded from the totals).

*Patients were able to select multiple forms of transportation

Nearly two thirds (62.2%) of patients were male, the majority (70.3%) resided in a rural setting, and about half (48.1%) completed a secondary education. The majority of patients (68.8%) were at least 35 years old. When asked about access to the facility, almost three-quarters (74.8%) of patients reported that they most often walked to get to the facility, followed by others who were using a moto taxi (11.1%). About seven percent of patients used a bicycle to reach the facility, 3.3 percent used a personal motorcycle, 1.7 percent used a taxi, and 0.7 percent used the bus (Table 3). The majority of patients (73.8%) stated that it took less than one hour to get to the facility

from their home using their usual method of transportation. A small percentage (5.1%) of patients reported it taking three hours or more to reach the facility (data not shown).

1.5. CHAs

A total of 473 CHAs (78.2% male and 21.8% female) were interviewed for the assessment. More than 90 percent reported that they were part of the RECO community group. Almost three-quarters (69.3%) of the CHAs had completed a secondary education, and almost 20 percent (19.5%) had a postsecondary education degree. The remaining 10.8 percent stated that they had completed a primary level of education, and only 0.4 percent reported having no education at all. The majority (81.2%) were at least 35 years old. When asked about their employment status, about half (50.7%) of the CHAs reported that they were self-employed, and 21.4 percent reported being employed full-time. The majority of the CHAs (87.9%) stated that they were either married or currently living with a partner but unmarried (Table 4).

Table 4. CHA characteristics

(n=473)	No.	%
Sex		
Male	370	78.2
Female	103	21.8
Age		
18–24	15	3.1
25–34	73	15.5
35–44	138	29.1
45–54	124	26.2
55+	123	25.9
CHA group		
RECO	449	94.9
MOCO	8	1.7
OAC	2	0.4
LNAC	4	0.8
TB ambassador	1	0.2
Former patient	1	0.2
Other	8	1.7
Highest education completed		
None	2	0.4
Primary	51	10.8
Secondary	328	69.3
Postsecondary	92	19.5
Marital status		
Never married	28	5.9
Currently living with a partner (unmarried)	29	6.1
Married	387	81.8
Separated	1	0.2

(n=473)	No.	%
Divorced	8	1.7
Widowed	20	4.2
Employment status		
Employed full-time	101	21.4
Employed part-time	72	15.2
Self-employed	240	50.7
Unemployed	48	10.1
Student	11	2.3

2. Structural Indicators

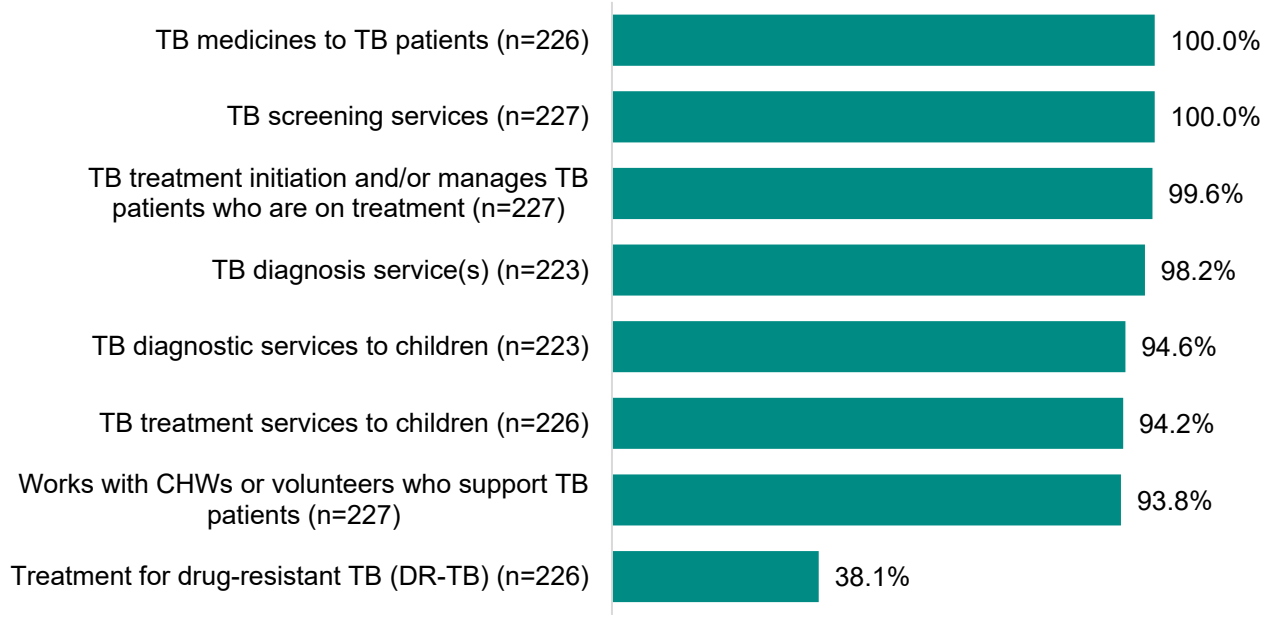
This section covers the factors that affect the context or environment in which TB care is provided to patients. In this study, structure was measured by the availability and management of TB services, physical infrastructure at the facility, the availability and condition of resources (i.e., equipment,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

2.1. Service Availability

2.1.1. General TB-Related Services

Staff at facilities were asked about the types of TB services they had provided at any time during the past 12 months (Figure 5). Nearly all facilities (98.2%) reported providing TB diagnosis services diagnosis, DS-TB treatment services to adults (99.6%), and DS-TB treatment to children (94.2%). Over a third of the facilities (38.1%) reported providing DR-TB treatment services. Of the 140 facilities that did not provide DR-TB treatment services, 14.3 percent reported referring patients elsewhere for DR-TB treatment (data not shown). A majority of facilities (93.8%) reported that they worked with CHAs or volunteers to support TB patients.

Figure 5. Overview of general TB services offered by health facilities

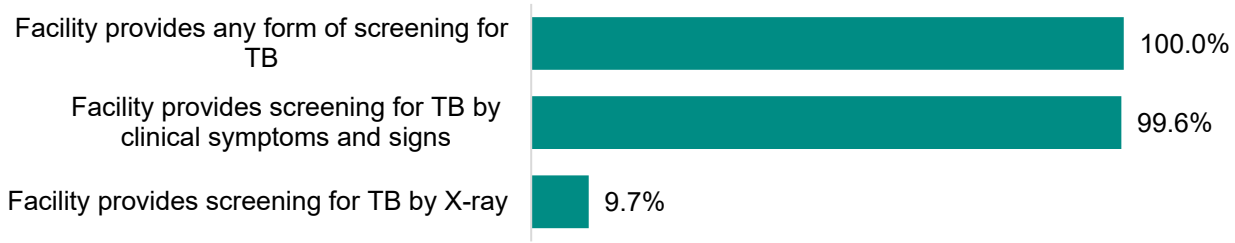


*Total number of respondents (N) varies by the type of services offered

2.1.2. TB Screening and Diagnosis

The facilities were asked to report what TB screening and diagnosis services they offered in the past year. All 227 facilities included in the assessment reported that they provided some form of screening for TB (Figure 6) and 98.2 percent reported providing some type of TB diagnosis (Figure 5). All but one facility indicated that they used clinical symptoms and signs to screen for TB (99.6%), whereas 9.7 percent reported that they provided screening using X-ray (Figure 6).

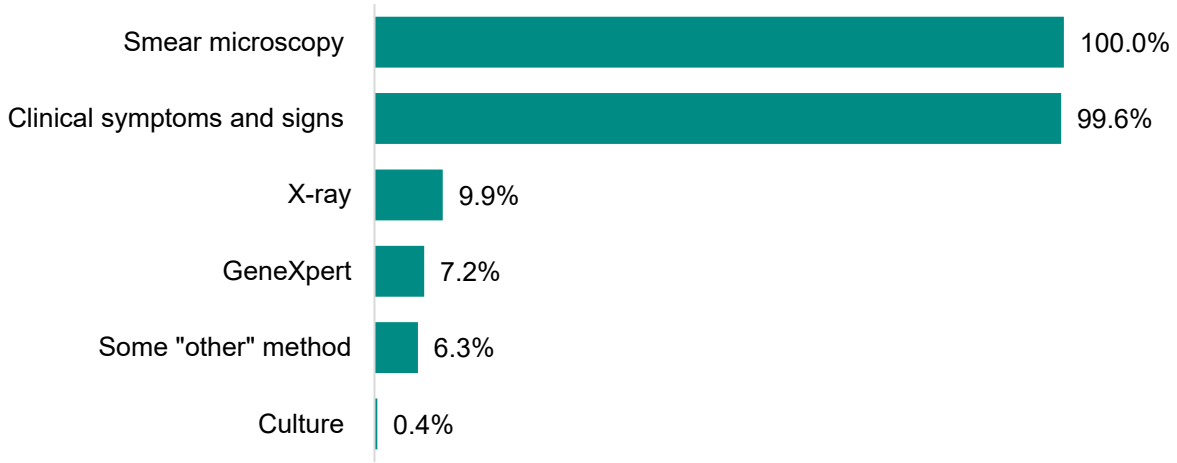
Figure 6. TB screening services offered by health facilities (n=227)



Of the 223 facilities that reported providing TB diagnosis services, 97.3 percent use an onsite lab for essential TB services and of these facilities, some also use an offsite lab. Seventy-two percent (n=161) used an offsite laboratory (data not shown). Among those which use an offsite lab, 37.9 percent use the offsite lab for smear microscopy (which could be related to lack of continuity of microscopy services due to supply and human resource shortages and other service-related factors), 65.2 percent for Xpert MTB/RIF or Ultra, 48.4 percent for first-line drug susceptibility

testing (DST) (other than Xpert), and 45.3 percent for second-line DST. These findings indicate that most facilities use both an onsite and offsite lab for different tests and services based on need. All facilities that provide TB diagnosis services reported using smear microscopy and all but one diagnosed TB by clinical symptoms and signs (99.6%). In contrast, only seven percent reported using GeneXpert as a diagnostic method and 9.9 percent reported using x-rays. Fewer than one percent were diagnosed with TB using culture (Figure 7).

Figure 7. Diagnostic methods used by health facilities that provided TB diagnostic services (n=223)



The national guidelines for TB diagnosis (algorithm) instruct the use of Xpert as the first-line test, but due to the unavailability of GeneXpert country-wide, smear microscopy is often used as a first-line test, followed by Xpert tests when the result is positive (Ministère de la santé and PNLT, 2022).

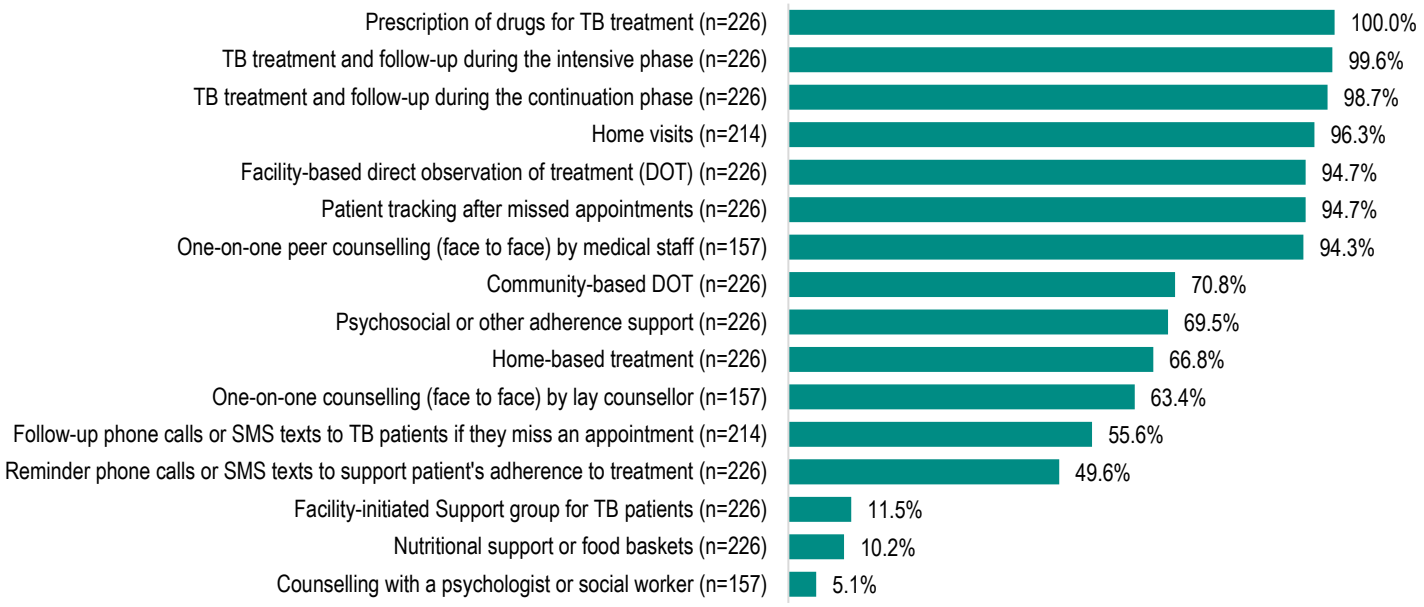
2.1.3. Treatment Services

The 226 facilities that provided treatment for TB were asked to describe the types of TB treatment and support services that they offered people with TB. Nearly all (99.6%) reported that they provided TB treatment and follow-up during the intensive phase of treatment, and 98.7 percent reported providing treatment and follow-up during the continuation phase (Figure 8). As mentioned previously, 38.1 percent of the facilities reported providing treatment for DR-TB. Home-based treatment was offered at 66.8 percent of the facilities, facility-based DOT was provided by 94.7 percent of the facilities, and community-based DOT was provided by 70.8 percent (Figure 8). Only 2.2 percent of the facilities offered video-based DOT (data not shown).

Psychosocial or other treatment adherence support was offered by 69.5 percent of the TB treatment facilities included in the assessment (Figure 8). When asked about specific psychosocial support services provided, 94.3 percent of these facilities reported offering one-on-one counseling (face-to-face) by medical staff (doctor or nurse) (Figure 8), and 62.4 percent reported offering one-on-one peer counseling (face-to-face) by a lay counselor (data not shown). Only 5.1 percent reported that they offered counseling with a psychologist or social worker (Figure 8).

Facilities were also asked to report services targeted at supporting treatment adherence. Nearly half (49.6%) of treatment facilities reported using reminder phone calls or text messages to support treatment adherence, and 94.7 percent followed up with patients who missed appointments. Among facilities following up with patients after missed appointments, 96.3 percent reported visiting patients in their home, and 55.6 percent reported following up via phone calls or text messages. Additional treatment support services included support groups for TB patients, which were offered at 11.5 percent of the facilities, and food baskets or other nutritional support, which were reported by 10.2 percent of treatment facilities (Figure 8).

Figure 8. TB treatment services and treatment support services offered by health facilities



*Total number of facilities (N) varies by the type of services offered

TB treatment facilities were asked about the use of treatment supporters for TB patients. Twenty-eight percent of the facilities reported that they allowed TB patients to take treatment without the supervision of a health professional, meaning that they received supervision from a family member or other contacts outside the facility. Of those facilities, about 52 percent reported that TB patients collected their medications on a monthly or bimonthly basis during the intensive phase of treatment. A majority of facilities (76.2%) reported that patients in the continuation phase of treatment typically collected their medications on a monthly or bimonthly basis. All facilities that allowed treatment without the supervision of a health professional reported monitoring the intervals at which patients should collect treatment. Seventy-eight percent reported that this was accomplished by checking the patient's empty drug blisters, 49.2 percent reported that it was monitored through patient cards, 20.6 percent reported that it was monitored by phone calls and through text messages, and 28.6 percent reported using some other method (Table 5).

Table 5. Treatment supervision practices used by facilities

	Facility Type						Facility Location						Total	
	Hospital (Tertiary)		RHC (Secondary)		HC (Primary)		Urban		Peri-urban		Rural			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
TB patients take treatment without the supervision of a health professional (n=226)	20	27.8	16	37.2	27	24.3	3	7.5	4	23.5	56	33.1	63	27.9
Frequency that most TB patients on TB treatment typically collected their medications during the intensive phase of treatment (n=63)														
Weekly	8	40	2	12.5	11	40.7	0	0	3	75	18	32.1	21	33.3
Twice a month	3	15	4	25	5	18.5	0	0	0	0	12	21.4	12	19
Monthly	7	35	8	50	6	22.2	1	33.3	0	0	20	35.7	21	33.3
Other frequency	2	10	2	12.5	5	18.5	2	66.7	1	25	6	10.7	9	14.3
Frequency that most TB patients on TB treatment typically collected their medications during the continuation phase of treatment (n=63)														
Weekly	3	15	1	6.3	6	22.2	1	33.3	3	75	6	10.7	10	15.9
Twice a month	1	5	2	12.5	4	14.8	0	0	0	0	7	12.5	7	11.1
Monthly	14	70	13	81.3	14	51.9	1	33.3	1	25	39	69.6	41	65.1
Other frequency	2	10	0	0	3	11.1	1	33.3	0	0	4	7.1	5	7.9
Facility monitors the intervals at which the patient should collect treatment (n=63)	20	100	16	100	27	100	3	100	4	100	56	100	63	100
Mechanisms used to monitor the intervals at which the patient should collect medication for treatment (n=63)														
Check empty blisters	15	75	12	75	22	81.5	2	66.7	2	50	45	80.4	49	77.8
Phone call	1	5	1	6.3	7	25.9	1	33.3	1	25	7	12.5	9	14.3
Text messages	1	5	1	6.3	2	7.4	0	0	0	0	4	7.1	4	6.3
Through the patient card	10	50	8	50	13	48.1	0	0	1	25	30	53.6	31	49.2
Other mechanism	9	45	6	37.5	3	11.1	1	33.3	1	25	16	28.6	18	28.6

2.1.4. Community-Based Services

Almost all (93.8%) facilities reported that they worked with CHAs to support TB patients (Appendix C, Table C8). These facilities were asked about the services provided by CHAs, and about the coordination and management of CHAs. More than 90 percent of the facilities reported that the CHAs provided education about TB in the community, screening for TB symptoms, referral for TB diagnosis, DOT, tracing or locating patients who missed follow-up visits, and bringing patients who missed follow-up visits back to the facility. Eighty-nine percent of the facilities with CHAs reported that they provided adherence counseling and contact tracing for confirmed TB patients. Last, 63.6 percent of the facilities with CHAs reported that the CHAs were responsible for the collection and transportation of specimens to a diagnostic laboratory and 68.1 percent reported that they were responsible for psychosocial support. Only 25 percent of the facilities reported that CHAs conducted HIV testing and counseling (data not shown).

The CHAs themselves were also asked to report the types of TB services that they provided in their communities. More than 85 percent of the CHAs who were interviewed in the assessment reported that they provided counseling treatment adherence, followed up with patients who missed appointments, and provided TB education. More than 60 percent of the CHAs reported that they provided psychosocial support, DOT, referred patients to health facilities for follow-up exams or visits, counseled and referred patients for HIV testing, carried out TB contact tracing, and referred the parents of children under five who had been in contact with a TB patient to a health facility for TPT (Appendix C, Table C8). More than 20 percent of the CHAs reported that they provided reminder phone calls or text messages to TB patients to support treatment adherence, follow-up phone calls or text messages to TB patients for missed appointments, TPT to children under five who were in contact with a TB patient, and reported adverse reactions to TB drugs to the health facility (Appendix C, Table C8).

The CHAs were asked about the types of training and supervision that they had received. At least 30 percent of the CHAs had received training on community DOT, identification and referral of presumptive TB patients; TB prevention, screening, treatment and follow-up; infection control, health education, and recording and reporting TB cases in the past 24 months. At least 20 percent of the CHAs had received training on those subjects more than 24 months ago. More than half (57.7%) of the CHAs reported that they had never received training on nutritional and mental health support to patients. Eighty-two percent of the CHAs said that they had received a supervision visit at some point, with 62 percent reporting that their most recent supervision visit was conducted within the past three months. Most CHAs (82.6%) reported that they met with staff from their health facility/nongovernmental organization or with Ministry of Health staff at least once a month (data not shown).

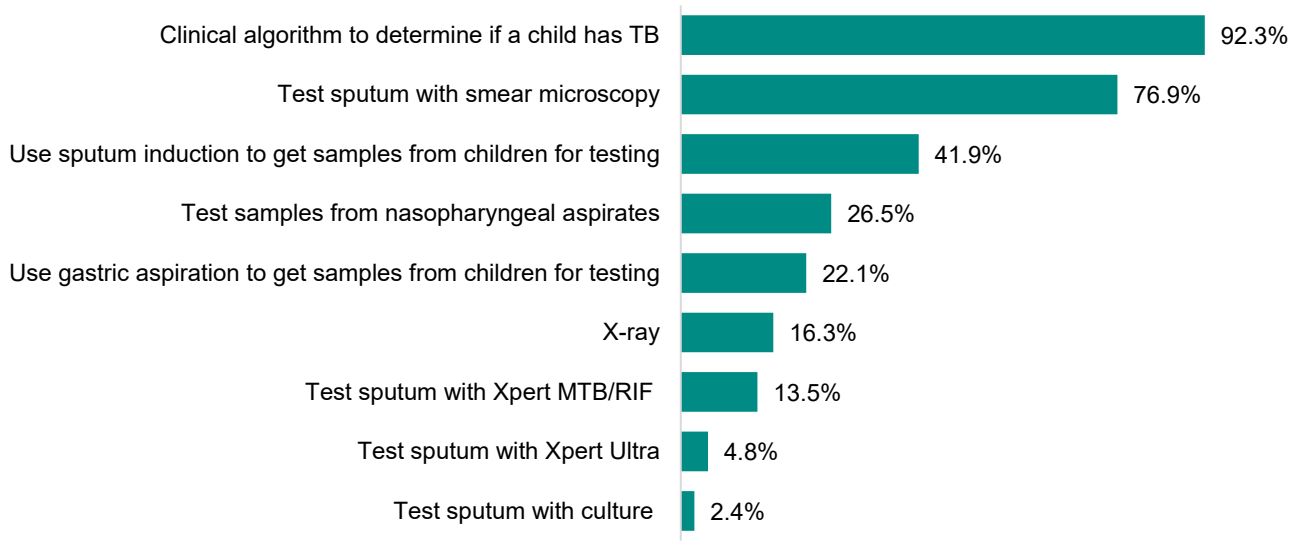
The facilities were asked to report the management and supervision practices in place for CHAs. Most facilities (86.9%) reported that they had a TB focal person at the facility who met regularly (i.e., monthly or quarterly) with the CHAs, and 81 percent reported that staff members at the facility conducted community-level supervision of the CHAs. About three-quarters (73.8%) of the facilities reported having an up-to-date list of CHAs who provided DOT, and 70.9 percent reported that the CHAs associated with the facility received TB-specific training. Only 21.7 percent of the facilities reported that they kept records of the performance of CHAs. On average,

facilities reported conducting 3.2 CHAs supervision visits in the past year, with little variation between facility location and facility type (data not shown).

2.1.5. Pediatric TB Services

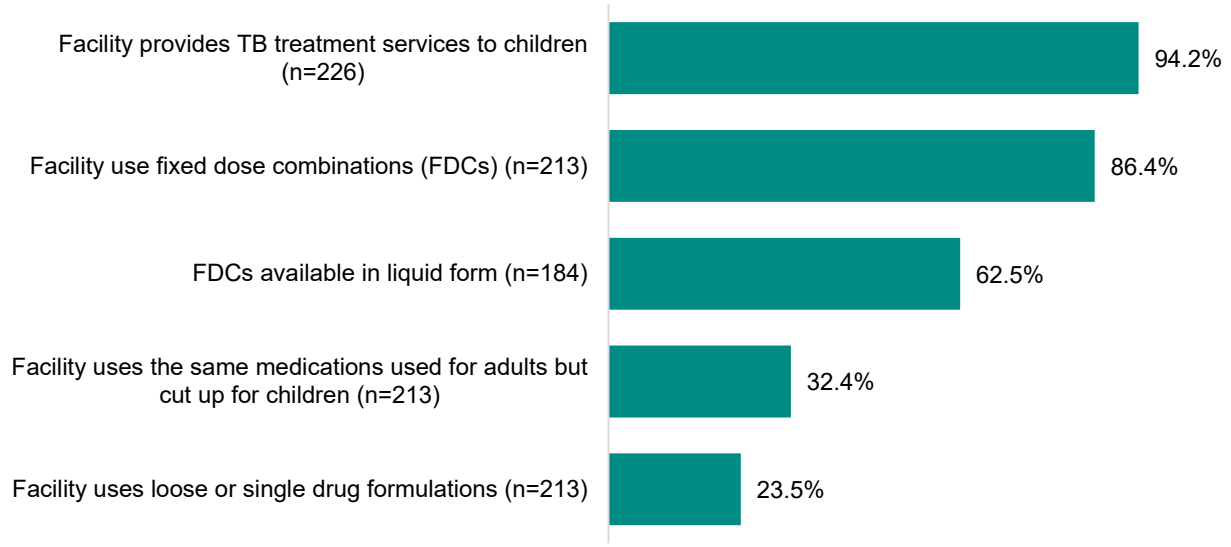
Two hundred and eight, or 94 percent of the facilities that reported offering TB treatment services, also reported providing pediatric TB treatment services (Figure 5). When asked how children with presumptive TB were evaluated, most of the facilities (92.3%) reported using a clinical algorithm to determine whether a child had TB or tested sputum with smear microscopy. Fewer than 20 percent of the facilities reported using x-ray, testing sputum with culture, Xpert MTB/RIF, or Xpert Ultra (Figure 9) to diagnose children with TB.

Figure 9. Methods used by health facilities to evaluate children with presumptive TB (n=208)



Most facilities that provided TB treatment for children (86.4%) reported using fixed-dose combinations. Among those facilities, 62.5 percent reported having fixed-dose combinations available in liquid form. About one-quarter of the facilities (23.5%) reported using loose or single drug formulations. Approximately one-third (32.4%) of the facilities offering TB treatment for children stated that they used the same medications used for adults but cut up the pills for children (Figure 10). Most pediatric TB treatment facilities (89.7%) reported that they determined dosage based on the child's weight, and 8.5 percent reported that the dosage for children was fixed in the kit (data not shown).

Figure 10. Pediatric TB treatment procedures used by health facilities



*Total number of facilities (N) varies by the type of services offered

2.1.6. TB/HIV Services

Over half (53.1%) of the facilities reported that they provided any HIV-related services, including counseling, testing, care, or treatment. When asked which type of HIV-related services were offered, more than 90 percent reported that they provided HIV testing and counseling for presumptive and confirmed TB patients, recency testing for HIV, HIV care and treatment for TB/HIV coinfected patients, and TPT. Nearly all (95.8%) of the facilities that reported providing HIV care and treatment to TB/HIV coinfected patients stated that they provided cotrimoxazole preventive therapy for those individuals, whereas only 27.1 percent reported conducting viral load testing. Of the facilities that reported providing TPT, 97.9 percent stated that they provided isoniazid (INH) (6, 9, 12 months, or continuous), 13.2 percent provided 3HP (rifapentine and INH), and 26.5 percent provided Q-TIB (cotrimoxazole, isoniazid, and vitamin B6) (Appendix C, Table C1). Over ninety percent (91.7%) of facilities that provided TB-HIV services provided ART. Of facilities providing ART, 72.7 percent stated that they screen for symptoms of anti-TB and antiretroviral drug interactions.

2.2. Laboratory Services

The assessment of laboratory infrastructure provided information about the availability of TB diagnostic tests required by the PNLT TB diagnosis algorithm, including equipment and reagents, as well as maintenance and human resources that are critical to ensure a functioning TB diagnostic network. The first section below examines the 97.3 percent of facilities that had an onsite laboratory to diagnose TB, followed by a section presenting data for the 72 percent of facilities that used an offsite laboratory (most facilities used both laboratory services).

2.2.1. Facilities with an Onsite Laboratory

2.2.1.1. Availability of Laboratory Equipment

Facilities that reported having an onsite laboratory were asked about the availability and functionality of supplies, equipment, and reagents. Almost all (96.2%) were equipped with a functional light microscope on the day of the assessment. For facilities that used a Ziehl-Neelsen test for acid fast bacilli, 92.7 percent had carbol fuchsin stain available, 85.4 percent had sulfuric acid available, and 95.8 percent had methyl blue stain (data not shown).

Three-quarters of the relevant facilities had a functional fluorescence microscope available, and 41.7 percent had auramine stain for the fluorescence microscope. Among facilities that had GeneXpert onsite, 90 percent had a functional GeneXpert module available, and 77.8 percent had a functional and unexpired Xpert MTB/RIF cartridge. Sixty-four percent of the relevant facilities had a functional biosafety hood or cabinet available on the day of the assessment (data not shown).

2.2.1.2. Specimen Transport

It took an average of 7.9 hours for specimens to be received at the laboratory. Peri-urban facilities reported the highest average, at 14.5 hours. Facilities reported that it took an average of 26.6 hours to receive specimen results from the onsite laboratory, with minimal differences between facility type and location (Table 6).

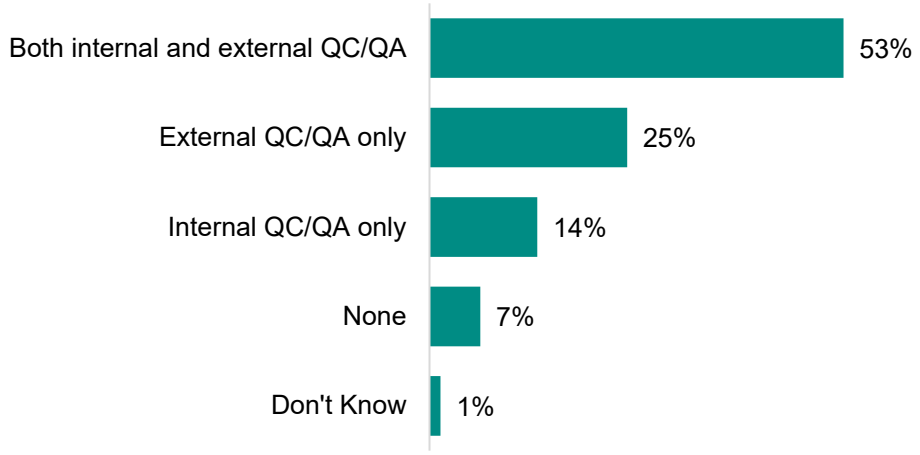
Table 6. Specimen transport among facilities with onsite laboratories

		Facility Type			Facility Location			
		Hospital (Tertiary)	RHC (Secondary)	HC (Primary)	Urban	Peri-urban	Rural	Total
Average number of hours it took to receive specimens at the laboratory (n=214)	Mean	8.2	9.1	7.4	6.9	14.5	7.5	7.9
	Range	[0–48]	[0–24]	[0–48]	[0–24]	[1–30]	[0–48]	[0–48]
Average number of hours it took to receive specimen results from the laboratory (n=217)	Mean	24	30.2	26.9	25.2	27.4	26.9	26.6
	Range	[0–72]	[0–48]	[0–72]	[0–48]	[2–48]	[0–72]	[0–72]

2.2.1.3. Quality Assurance and Quality Control

The 217 facilities with an onsite laboratory were asked about quality control (QC) and quality assurance (QA) procedures for smear microscopy used in their laboratories. More than half (53%) reported using both internal and external QC/QA practices, whereas 25.3 percent relied on external QC/QA only, and 13.8 percent reported using internal measures only. Overall, 7.9 percent of the facilities reported that they either did not know what QC/QA practices were used or that none were used at their facility (Figure 11).

Figure 11. Smear microscopy QC and QA types used for facilities with onsite laboratories (n=217)



Of the facilities that reported implementing QC/QA measures, 61.5 percent maintained records of the results from the QC/QA procedures, and 73.1 percent had guidelines and procedures available for internal and/or external QC/QA for the specimens being assessed at the facility (data not shown).

2.2.2. Facilities with an Offsite Laboratory

2.2.2.1. Diagnostic Testing Availability

When asked to report the types of TB diagnostic tests performed by the offsite lab, more than half of the facilities (65.2%) reported using an offsite lab to perform Xpert MTB/RIF or Ultra testing. About half used an offsite lab to perform other first-line DST (48.4%) and second-line DST (45.3%). Moreover, 37.9 percent used an offsite laboratory to perform smear microscopy (Table 7).

Table 7. Offsite laboratory testing services used by health facilities with offsite laboratories

	Facility Type						Facility Location						Total (n=161)	
	Hospital (Tertiary)		RHC (Secondary)		HC (Primary)		Urban		Peri-urban		Rural			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Smear microscopy	14	27.5	13	54.2	34	39.5	2	5.4	9	52.9	50	46.7	61	37.9
Xpert MTB/RIF or Ultra	34	66.7	14	58.3	57	66.3	33	89.2	10	58.8	62	57.9	105	65.2
First-line DST (other than Xpert)	20	39.2	9	37.5	49	57	31	83.8	8	47.1	39	36.4	78	48.4
Second-line DST	19	37.3	8	33.3	46	53.5	30	81.1	8	47.1	35	32.7	73	45.3

2.2.2.2. Specimen Transport

Fewer than half of the facilities (40.4%) that used an offsite laboratory reported having access to a specimen transport service. These facilities reported that, on average, specimen transportation to the laboratory occurred every 3.8 days. Compared to other facility types, HCs and rural facilities reported even longer wait times between specimen collection and transportation to an offsite lab. The assessment also looked at the turnaround time for receiving specimen results from offsite laboratories. On average, it took about 11.6 days for facilities to receive results from the offsite laboratory. The turnaround time was slightly longer for peri-urban facilities and hospitals/hospital centers/clinics (Table 8).

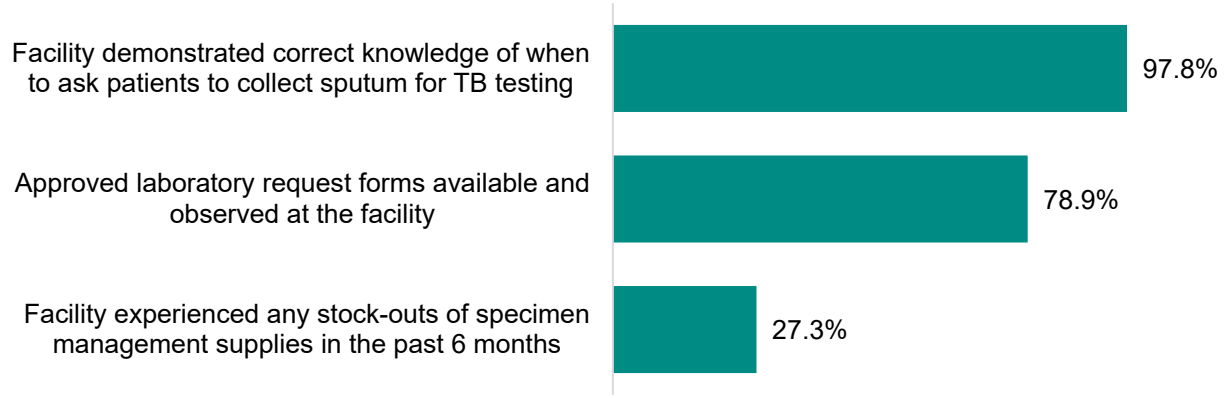
Table 8. Specimen transport among facilities with offsite laboratories

		Facility Type			Facility Location			
		Hospital (Tertiary)	RHC (Secondary)	HC (Primy)	Urban	Peri-urban	Rural	Total
Average frequency (in days) that specimen transportation to the laboratory occurred (n=121)	Mean	2.4	1.7	4.9	3.4	2.7	4.4	3.8
	Range	[0–10]	[0–2]	[0–90]	[0– 20]	[0–9]	[0–90]	[0–90]
Average number of days it took to receive the results from the offsite laboratory (n=143)	Mean	13.2	10.5	11.2	11.6	14.2	11.1	11.6
	Range	[0–40]	[2–30]	[0–40]	[0– 30]	[0–40]	[0–40]	[0–40]

2.2.3. Specimen Management Procedures and Equipment (All Facilities)

All 227 facilities included in the assessment were asked to describe their sputum collection and processing. Nearly all facilities (97.8%) demonstrated correct knowledge when asked about the timing and manner/process (e.g., before eating and drinking) for patients to provide sputum for TB testing (Figure 11). Standard operating procedures for specimen collection were only observed at 31.7 percent of the health facilities (data not shown). In assessing the availability of sputum collection supplies, 27.3 percent reported that they had experienced stockouts of any supplies in the six months before the assessment. About three-quarters of all facilities (78.9%) had laboratory request forms observed at the facility on the day of the assessment (Figure 12).

Figure 12. Specimen management procedures and equipment reported by health facilities (n=227)



Facility laboratory registers were assessed to determine the turn-around time for results of diagnostic smears and Xpert. Between January 1 and March 31, 2021, 86 percent of diagnostic smear results were received within two days of being submitted to the laboratory. During the same time period, 24.4 percent of Xpert test results were received from the laboratory within the day that the tests were submitted.

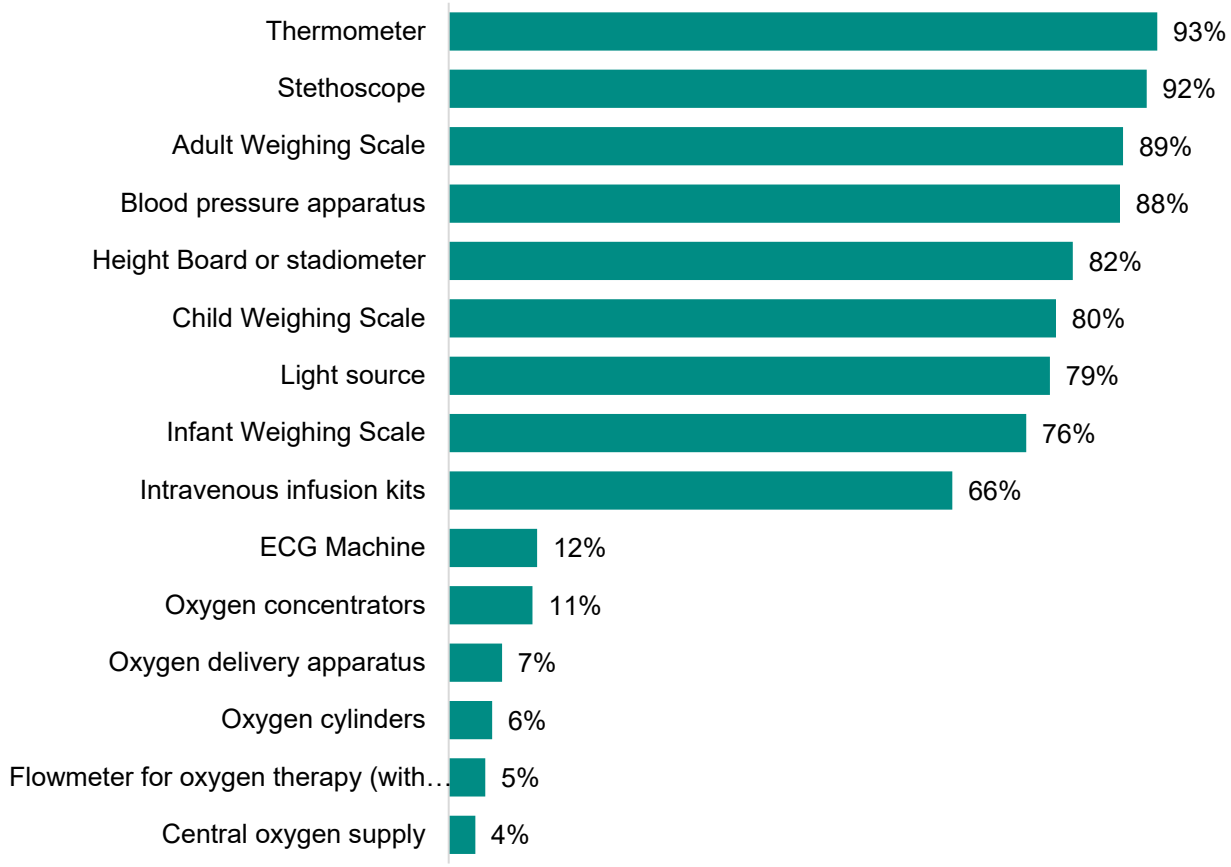
2.3. Availability of General Equipment and TB Drugs

Facilities were assessed on the availability of general medical equipment and drugs that allow them to readily deliver basic health and TB-related services. The findings are reported in the text and figures below.

2.3.1. General Equipment

More than two-thirds of the 227 health facilities included in the assessment had at least one functional piece of the following medical equipment: thermometer (93%), stethoscope (91.6%), adult weighing scale (88.5%), blood pressure apparatus (88.1%), measuring tape-height board or stadiometer (81.9%), child weighing scale (79.7%), light source (78.9%), infant weighing scale (75.8%), and intravenous infusion kit (66.1%). As shown in Figure 13, fewer than 12 percent of the facilities had an oxygen concentrator, oxygen cylinder, central oxygen supply, flowmeter for oxygen therapy (with humidification), or oxygen delivery apparatus available. Among the facilities that provided DR-TB treatment, only 11.6 percent had an electrocardiogram machine available on the day of the assessment (Figure 13). Moreover, only 2.3 percent of DR-TB treatment facilities had audiometry equipment available as a result of injectables being replaced by newer regimen, aligned with a very low use of injectables (<2%) (data not shown).

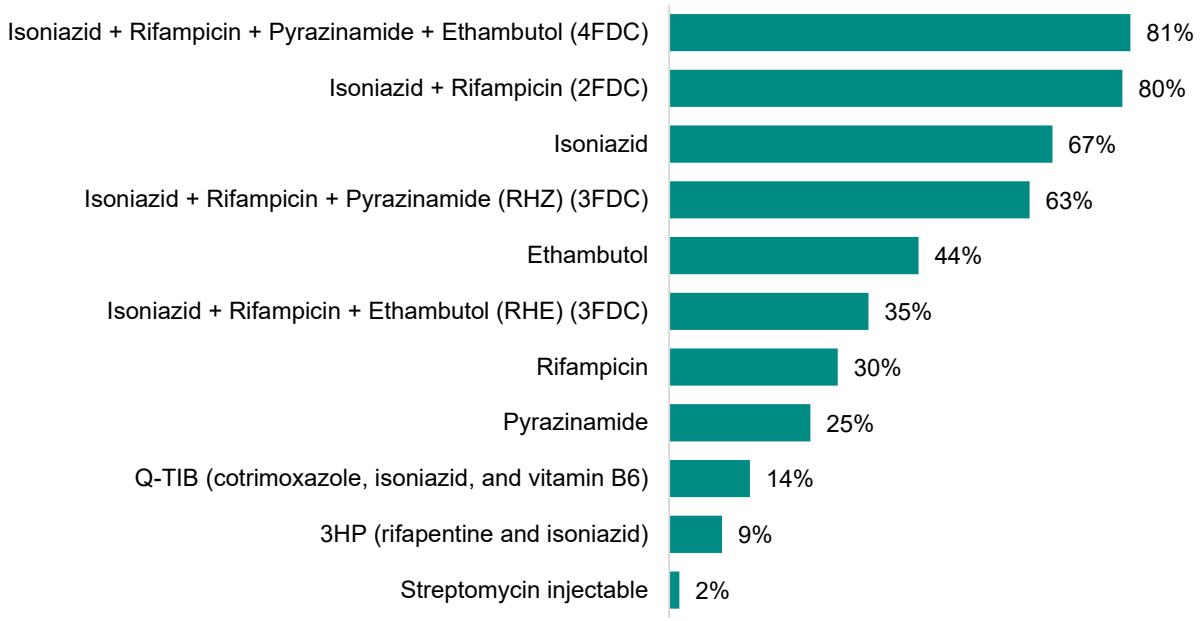
Figure 13. Availability of functional basic equipment at the time of the assessment (n=227)



2.3.2. Availability of TB Drugs

An uninterrupted supply of TB drugs is critical to a facility's ability to provide the full course of TB treatment and ensure successful outcomes. The survey assessed the availability and validity (i.e., drugs were not expired or damaged) of first-line TB drugs at all facilities providing TB treatment. As shown in Figure 14, various TB drugs were available in 1.8 percent to 81 percent of the 227 treatment facilities on the day of the assessment. More than half (56.6%) of the treatment facilities reported maintaining a buffer stock of anti-TB medications, but 38.9 percent reported experiencing a stockout of any anti-TB medicine in the six months leading up to the assessment (data not shown).

Figure 14. Availability of unexpired TB drugs at the health facilities (n=226)



2.4. Management

2.4.1. Availability of Guidelines/Protocols

All facilities were assessed on the availability of TB policies, protocols, and guidelines. Flowcharts/algorithms on TB screening and diagnosis, and guidelines for diagnosis of TB among children and adolescents were observed at about two-thirds of the health facilities. TB/HIV guidelines were observed at 70.9 percent of the facilities and national TB program guidelines (the PATI) were observed at 81.1 percent of the facilities. About one-quarter of the facilities (26.4%) had TB posters on walls, leaflets, brochures, and/or pamphlets (i.e., educational materials about TB) in local languages for distribution (Table 9).

Table 9. Availability of TB policies, protocols, and guidelines

	Facility Type						Facility Location						Total (n=227)	
	Hospital (Tertiary)		RHC (Secondary)		HC (Primary)		Urban		Peri-urban		Rural			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Flowcharts or algorithms on TB screening	52	72.2	27	62.8	72	64.3	33	80.5	14	82.4	104	61.5	151	66.5
Guidelines for diagnosis and treatment of TB among children and adolescents	53	73.6	22	51.2	75	67	34	82.9	13	76.5	103	60.9	150	66.1

	Facility Type						Facility Location						Total (n=227)	
	Hospital (Tertiary)		RHC (Secondary)		HC (Primary)		Urban		Peri-urban		Rural			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
PATI	62	86.1	32	74.4	90	80.4	36	87.8	17	100	131	77.5	184	81.1
TB/HIV guidelines	50	74.6	21	53.8	73	75.3	36	87.8	13	81.3	95	65.1	144	70.9
TB posters on walls, leaflets, brochures, and/or pamphlets in local languages for distribution	14	19.4	3	7	43	38.4	17	41.5	8	47.1	35	20.7	60	26.4

Sixty-five percent of the facilities that provided TB diagnosis services had flowcharts or algorithms on TB diagnosis and three-quarters had algorithms for GeneXpert. About one-quarter of the TB diagnosis facilities had guidelines on the use of chest X-ray for TB screening and diagnosis whereas less than one percent had a manual or guidelines on smear microscopy. Between 60 percent and 70 percent of DR-TB treatment facilities had guidelines on the use of short regimens for DR-TB treatment, guidelines on clinical management of DR-TB, or an essential drug/medicines list. A little over a third (36.1%) of the treatment facilities had a training manual for DOT providers or CHAs (data not shown).

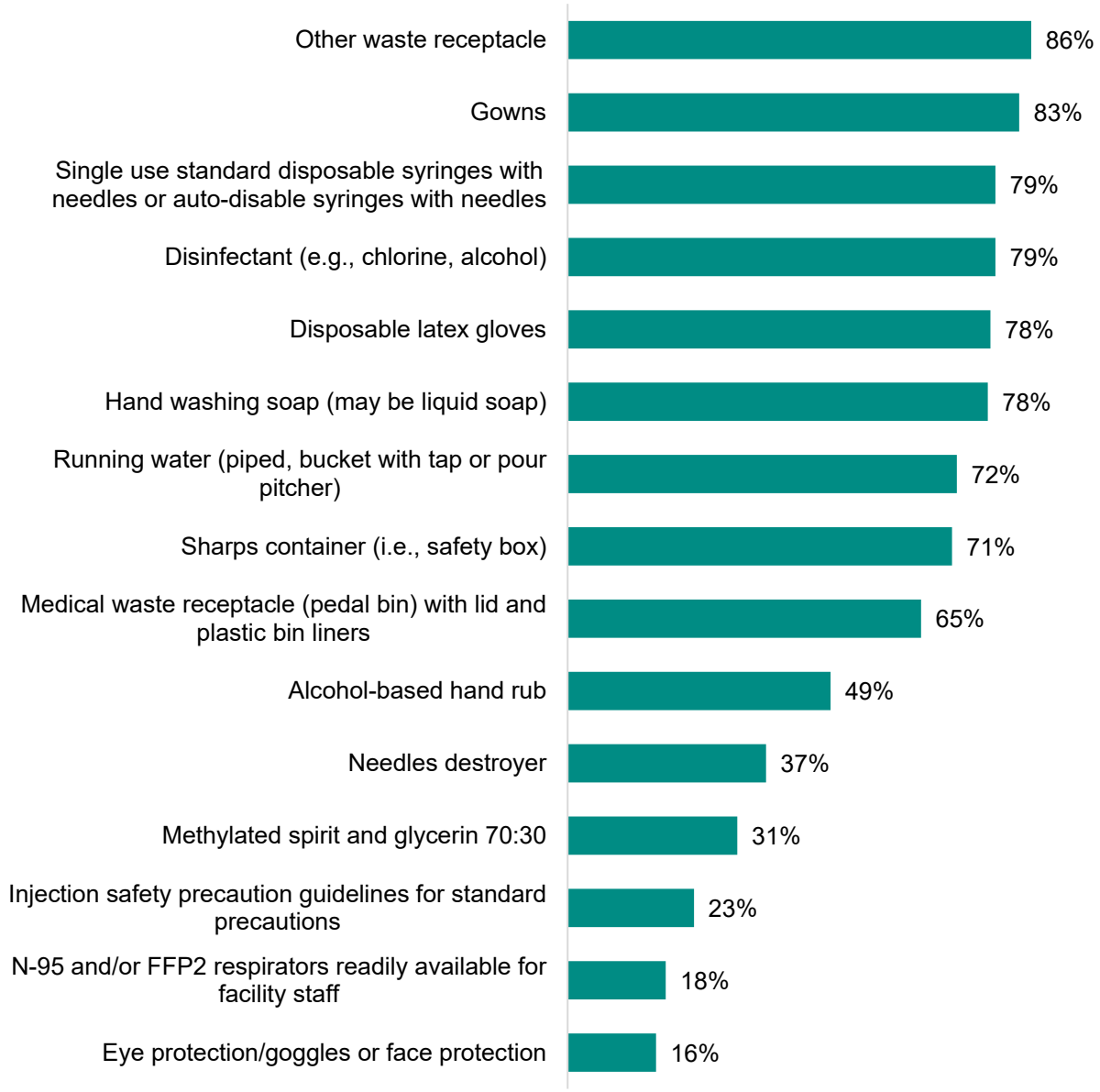
2.5. Infection Prevention and Control

Given the high risk for transmission of TB in healthcare settings, it is critical for facilities to adhere to infection prevention and control (IPC) practices. As part of the assessment, study facilities were asked about the availability of IPC commodities and infrastructure and the IPC practices at the facility.

2.5.1. Infrastructure

More than 83 percent of the 227 facilities were found to have a waste receptacle and gowns available in the examination areas at the time of the assessment. Between 70 percent and 80 percent of the facilities had running water, hand washing soap, a sharps container, disposable latex gloves, disinfectant, and single-use standard disposable syringes with needles or auto-disable syringes with needles. A medical waste receptacle with a lid and plastic bin liner was found at 65.2 percent of the facilities and alcohol-based hand rub was found at 48.5 percent of the facilities. Fewer than 40 percent of the facilities had eye protection/goggles or face protection, injection safety precaution guidelines for standard precautions, a needles destroyer, methylated spirits and glycerin 70:30, and N-95 and/or FFP2 respirators for facility staff (Figure 15). Little difference in availability of these commodities was observed between the types of facilities and locations (Appendix C, Table C2).

Figure 15. IPC materials available at the health facility (n=227)



2.5.2. Practices

Nearly all facilities (99.1%) reported routinely asking patients about cough when entering the facility and 77.5 percent reported implementing cough triage for patients at the facility. Surgical masks were available for presumptive and confirmed TB patients at just 24.2 percent of the facilities. However, of those facilities with surgical masks available, 89.1 percent reported that surgical masks were worn by presumptive and confirmed TB patients. Nearly half (46.3%) of the facilities had a cough monitor who assisted with separating coughing patients and 53.3 percent reported having a staff member designated as an IPC focal point. Just 30 percent of the facilities reported having a separate waiting area to isolate potentially infectious individuals (Table 10).

Thirty-seven percent of providers stated, when prompted, that they turn on fans to exhaust air outside the room or blow air in the direction away from others while treating TB presumptive or confirmed cases, and it was observed in 51.5 percent of facilities that sputum collection took place in a well-ventilated area.

Table 10. IPC practices

	Facility Type						Facility Location						Total (n=227)	
	Hospital (Tertiary)		RHC (Secondary)		HC (Primary)		Urban		Peri-urban		Rural			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Staff member designated as an IPC focal point	41	56.9	14	32.6	66	58.9	37	90.2	10	58.8	74	43.8	121	53.3
Patients routinely asked about cough when entering the facility	70	97.2	43	100	112	100	40	97.6	16	94.1	169	100	225	99.1
Cough triage implemented	61	84.7	19	44.2	96	85.7	37	90.2	16	94.1	123	72.8	176	77.5
Separate waiting area to isolate potentially infectious individuals	30	41.7	8	18.6	30	26.8	8	19.5	7	41.2	53	31.4	68	30
Cough monitor assisting with separation	38	52.8	9	20.9	58	51.8	26	63.4	9	52.9	70	41.4	105	46.3
Surgical masks available for presumptive and confirmed TB patients	25	34.7	5	11.6	25	22.3	3	7.3	7	41.2	45	26.6	55	24.2
Surgical masks worn by presumptive and confirmed TB patients (n=55)	21	84	4	80	24	96	3	100	6	85.7	40	88.9	49	89.1

2.5.3. Screening of Healthcare Providers

Each facility was asked about TB screening practices in place for health facility staff. About half (50.7%) of the facilities reported that they had a system in place to screen and evaluate facility staff for TB disease. Among those facilities, one-third (33%) reported that they had staff members who were diagnosed with active TB disease in the two years before the assessment. When comparing screening practices across the three facility types, HCs were more likely to have a screening system in place than RHCs. In addition, rural facilities were less likely to have a screening system than urban or peri-urban facilities. Nearly half (45.2%) of the hospitals/hospital centers/clinics reported having staff members who had been diagnosed with active TB, whereas one-quarter of the HCs and one-third of RHCs reported a staff member testing positive (Table 11).

Table 11. TB screening practices among facility staff

	Facility Type						Facility Location						Total	
	Hospital (Tertiary)		RHC (Secondary)		HC (Primary)		Urban		Peri-urban		Rural			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
System in place to screen and evaluate facility staff for TB disease (n=227)	42	58.3	9	20.9	64	57.1	29	70.7	12	70.6	74	43.8	115	50.7
Facility has staff members who have been diagnosed with active TB disease in the past 2 years (n=115)	19	45.2	3	33.3	16	25	9	31	3	25	26	35.1	38	33

2.6. Provider Capacity to Provide TB Services

2.6.1. Facility and Provider-Reported Training

To document the providers' capacity to deliver quality TB care, the QTSA assessed which TB training and refresher training had been received by providers in the two years leading up to the survey. Healthcare providers themselves were also directly asked about TB training that they had personally received in the past two years. Overall, both providers and health facilities reported low rates of training. In most cases, providers reported lower rates of training than the facilities did. Just over half of the facilities reported that their staff had received training on TB diagnosis based on clinical assessment, TB diagnosis via sputum tests using smear microscopy, prescription of anti-TB drugs, management of TB/HIV coinfection, and TB case management. No more than half of the providers reported receiving training on any of the topics asked about in the assessment (data not shown).

2.6.2. Supervision

When asked about supervision received by the facility, about three-quarters (72.8%) of the facilities reported receiving a supervisory visit from someone at an upper-level office in the past three months. Of the facilities that had received a supervisory visit, more than 90 percent reported that during the supervision, the pharmacy was assessed for drug stockouts, expired medicines, etc.; the laboratory was assessed; TB data was assessed for completeness, quality, and/or timeliness; and TB data was used to discuss the performance of the health facility. About three-quarters of the facilities reported that a supervisory checklist was completed, and that the supervisor provided a record of written comments or suggestions from the visit (Table 12).

Table 12. Facility-reported supervision

	Facility Type						Facility Location						Total	
	Hospital (Tertiary)		RHC (Secondary)		HC (Primary)		Urban		Peri-urban		Rural			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Supervisors from any upper-level office conducted a supervisory visit in the past 3 months (n=227)	63	87.5	28	65.1	98	87.5	32	78.1	17	100.0	140	82.8	189	83.3
Activities performed during the last supervisory visit to the facility (n=189)														
Assess the pharmacy	56	88.9	26	92.9	91	92.9	30	93.7	16	94.1	127	90.7	173	91.5
Assess the laboratory	56	88.9	26	92.9	89	90.8	30	93.7	15	88.2	126	90.0	171	90.5
Assess TB data	58	92.1	27	96.4	92	93.9	31	96.8	16	94.1	130	92.8	177	93.7
Discuss the performance of the facility based on TB data	58	92.1	21	75.0	93	94.9	30	93.7	17	100.0	125	89.3	172	91.0
Complete the supervisory checklist	46	73.0	20	71.4	83	84.7	29	90.6	14	82.4	106	75.7	149	78.8
Provide a record of written comments or suggestions from their visit	46	73.0	18	64.3	79	80.6	28	87.5	12	70.6	103	73.6	143	75.7

3. Process Indicators

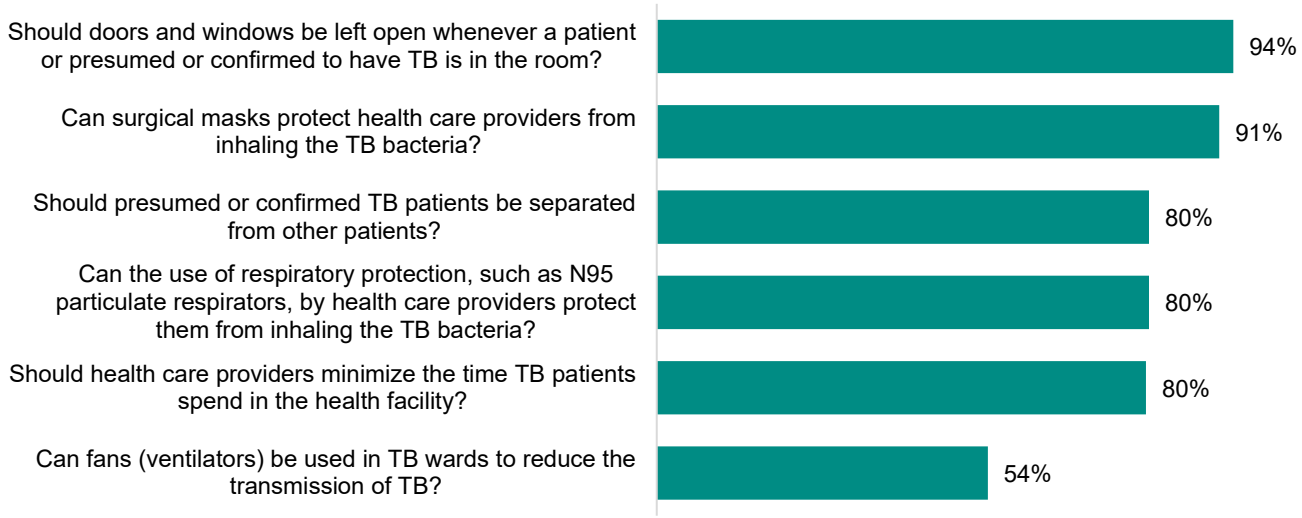
3.1. Provider Knowledge and Practices

Providers' knowledge and practices were assessed through the Provider Interviewer, which was administered to individual TB providers, and through the Facility Audit, which asked TB focal points questions related to knowledge and practices.

3.1.1. Provider Knowledge

TB providers were assessed on their knowledge of TB IPC using targeted questions. Overall, healthcare providers had a high level of knowledge about TB IPC, with every question except one being answered correctly by more than 80 percent of the 429 respondents. Only around half (54%) of the respondents knew that the use of fans (ventilators) could reduce transmission (when prompted). However, more than 90 percent of the respondents knew that doors and windows should be left open when a presumed/confirmed TB patient was in the room and 80 percent of respondents knew that N-95 particulate respirators can be used to protect healthcare providers from inhaling TB bacteria (Figure 16).

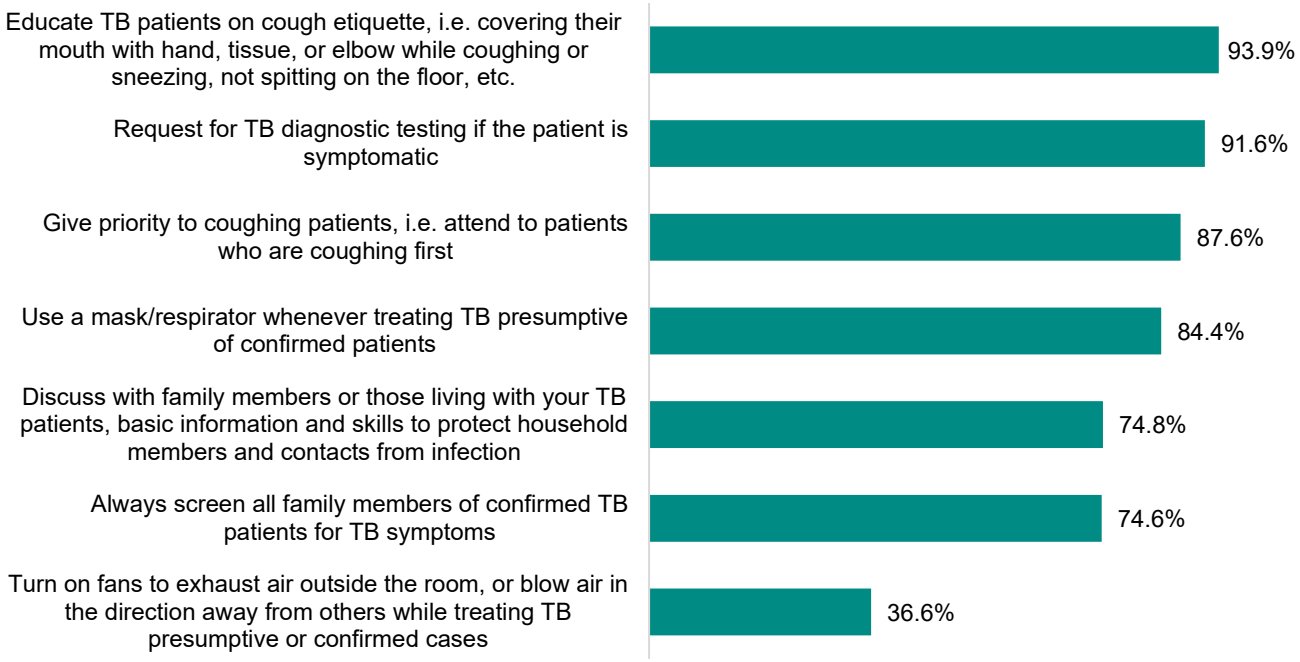
Figure 16. Provider knowledge of TB care procedures (n=429)



3.1.2. Provider-Reported Practices

TB providers were assessed on what IPC practices they used when they were with a presumed or confirmed TB patient. More than three-quarters of the respondents indicated that they used a mask/respirator when caring for presumptive or confirmed TB patients; attended to patients who were coughing before others; educated TB patients on cough etiquette; requested TB diagnostic testing if the client was symptomatic; always screened all family members of confirmed TB patients for TB symptoms; and discussed with family members basic information and skills to protect them and other contacts from infection. Fewer than half (36.6%) of the providers stated that they turned on fans to exhaust air outside the room or blow air in the direction away from others when treating presumptive/confirmed TB patients (Figure 17).

Figure 17. Provider reported IPC practices when caring for presumptive or confirmed TB patients (n=429)



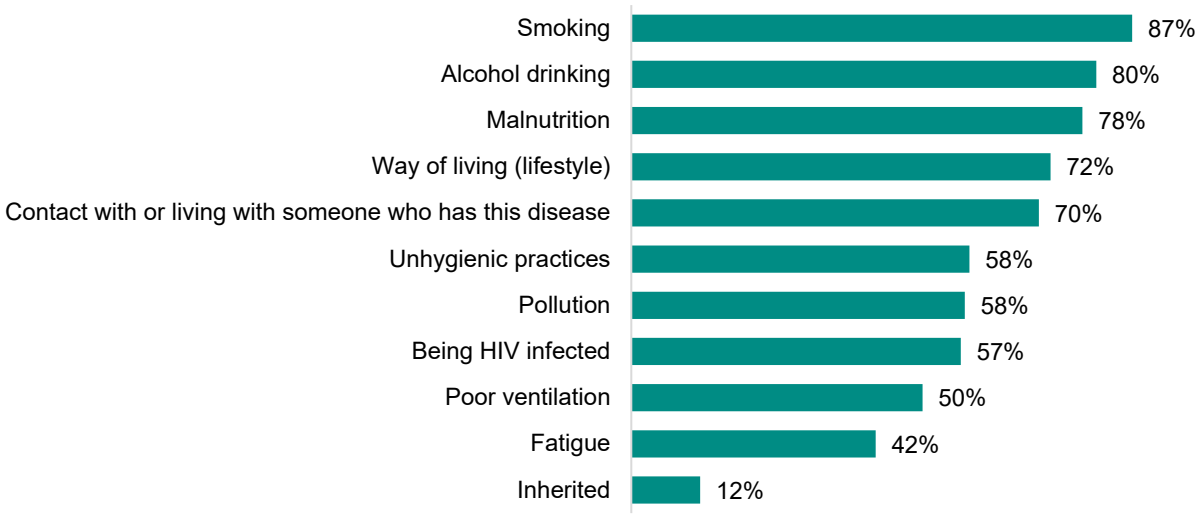
3.2. Knowledge of TB among Patients

Patients' knowledge of TB was assessed through a series of questions which asked patients to list TB risk factors, modes of transmission, and drug side effects. Respondents were first asked to give their answers unprompted and then were prompted with any remaining answers that they did not initially mention. Responses were further disaggregated by the type of TB diagnosis (DR-TB vs. DS-TB).

3.2.1. Risk Factors

More than 70 percent of the 489 patients surveyed mentioned lifestyle, smoking, drinking alcohol, malnutrition, and contact or living with someone who had TB as risk factors for the disease. Between 50 and 70 percent of the patients stated fatigue, unhygienic practices, poor ventilation, pollution, and being HIV infected as risk factors. Fewer than 15 percent of patients mentioned genetics as a risk factor (Figure 18). There was minimal variation in the responses from patients with DR-TB compared with patients with DS-TB (Appendix C, Table C3).

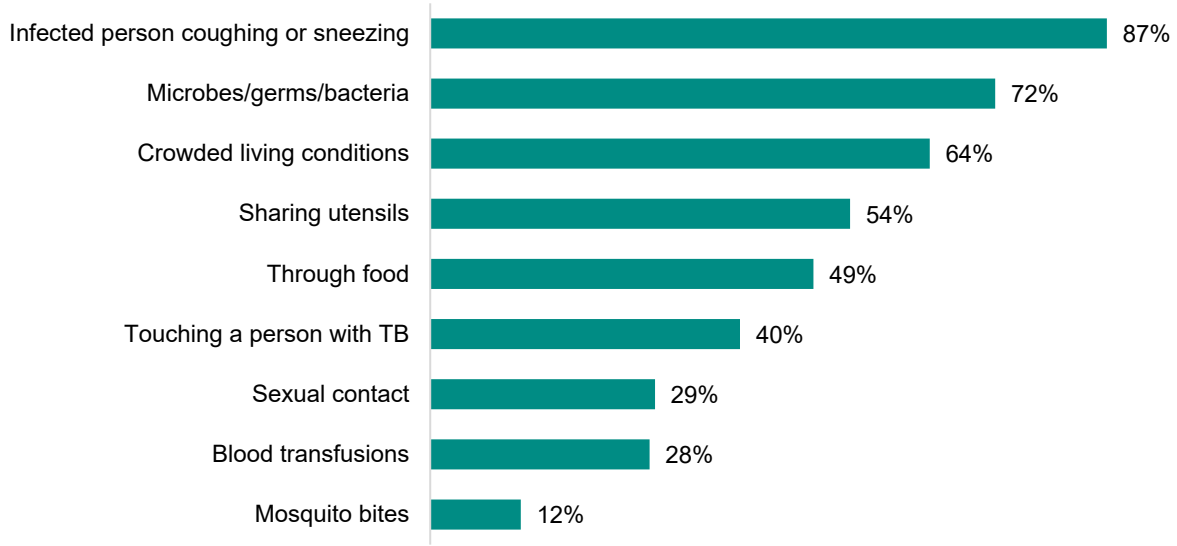
Figure 18. Patient knowledge on risk factors associated with TB (n=489)



3.2.2. Transmission

The majority of patients had a high level of knowledge about TB transmission, with more than three-quarters reporting that microbes/germs/bacteria and coughs or sneezes from an infected person were possible modes of transmission. More than half of the patients stated that TB can be transmitted through crowded living conditions, sharing utensils, and food. A smaller proportion identified blood transfusions (28.1%), touching a person with TB (39.7%), mosquito bites (11.6%), and sexual contact (28.8%) as modes of TB transmission (Figure 19).

Figure 19. Patient knowledge on TB transmission (n=489)



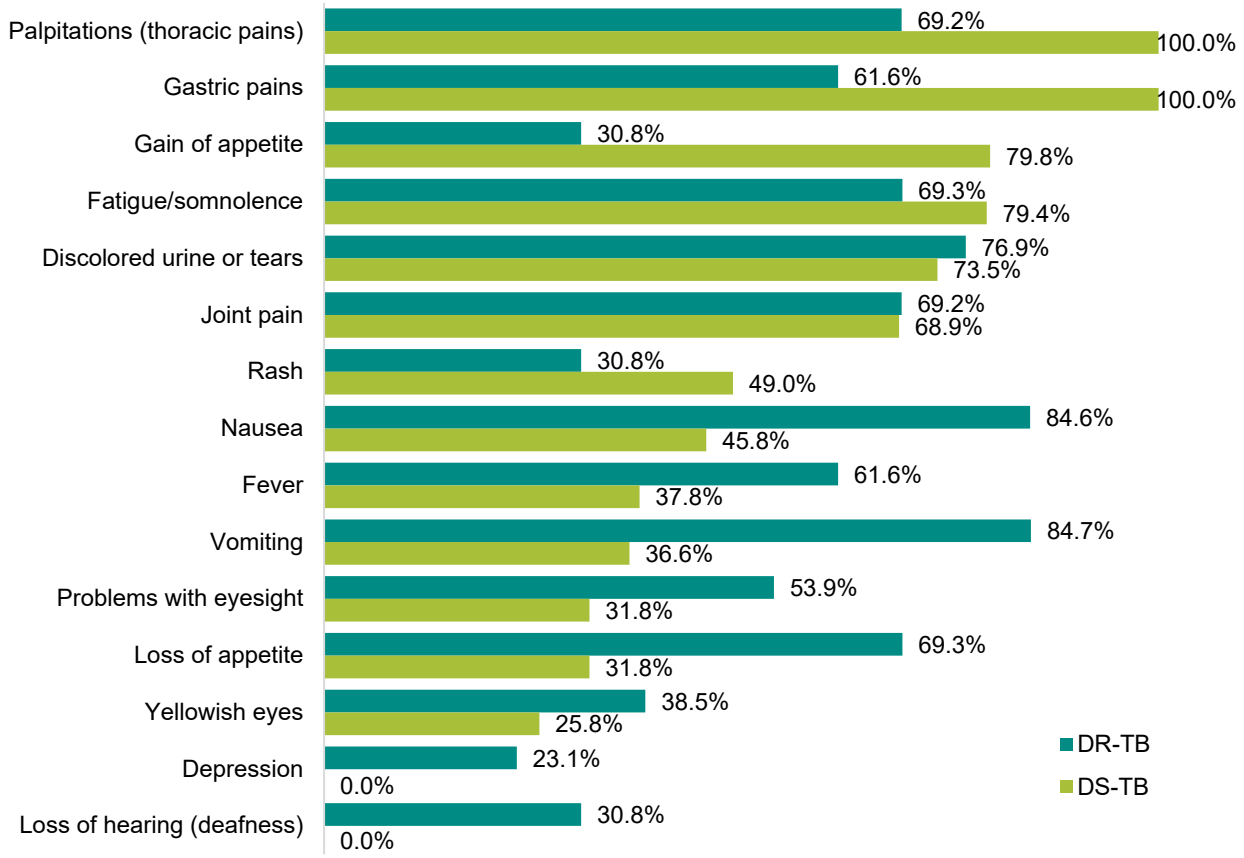
3.2.3. Symptoms

Results showed that patients had an overall high level of knowledge about TB symptoms. More than three-quarters of patients correctly identified all TB symptoms included in the assessment tool. At least 90 percent of patients reported chronic cough for more than three weeks, unexplained weight loss, and tiredness or fatigue as symptoms. However, although more than half of the individuals surveyed responded positively when prompted about night sweats and persistent shortness of breath, fewer than 30 percent did so unprompted (Appendix C, Table C4).

3.2.4. Side Effects of TB Drugs

Patients generally stated multiple possible side effects from TB drugs. The most common side effect reported by both DS-TB and DR-TB patients was fatigue or somnolence (69.3% of DR-TB patients and 79.4% of DS-TB patients) and discolored urine or tears (76.9% of DR-TB patients and 73.5% of DS-TB patients) as shown in Figure 20. Several differences in reported side effects were apparent between DS-TB and DR-TB patients, with DR-TB patients identifying more side effects overall. Most DS-TB patients reported palpitations (100%), gastric pains (100%) and increased appetite (79.8%) making these the most reported side effects among DS-TB patients, whereas more than 80 percent of DR-TB patients reported nausea and vomiting, making these the two most commonly reported side effects among DR-TB patients.

Figure 20. Patient knowledge on side effects of TB drugs (n=489)



3.2.5. Stigma and Discrimination

Understanding patients' perceived stigma and discrimination about TB is an important aspect of assessing the quality of care that patients receive. In the interview, patients were asked a series of questions about how they were treated by others at the health facility on a Likert scale, with one being "strongly disagree" and five being "strongly agree". More than 90 percent of patients "agreed" or "strongly agreed" that they felt welcome at the health facility, healthcare providers treated them with respect, and providers treated them the same way that they were treated when they received care for other illnesses. However, a high percentage also indicated unpleasant interactions, such as healthcare providers turning their faces away when speaking to them (86.5%); people at the facility showing discriminatory attitudes toward them because of their disease (87.7%); and feeling distressed, intimated, or offended when interacting with healthcare providers at the facility (87.6%) (Appendix C, Table C5). Comparing DS-TB and DR-TB patients, no significant differences were found in how patients felt that they were treated at the health facility. Although patients who visited urban or peri-urban facilities were more likely to feel more welcomed, respected, and treated the same way that they were treated when they received care for other illnesses, they also agreed more often to questions about experiences with healthcare

providers turning their faces away when speaking to them; people at the facility showing discriminatory attitudes toward them because of their disease; and feeling distressed, intimidated, or offended when interacting with healthcare providers at the facility (data not shown).

3.3. Patient-Provider Interactions

3.3.1. Patient Perspective

Patients were asked about their interactions with healthcare providers during facility visits. More than 85 percent of the patients stated that the provider explained details related to their care in a way that they could understand, listened to their opinions and ideas on the best way to follow the treatment, discussed their status or progress with them at every scheduled appointment, gave them a chance to ask questions about anything that concerned them, and listened carefully. About three-quarters of patients (74.5%) reported that providers told them how TB can affect their everyday life. Over 80 percent said they usually had enough time to discuss their health needs with the provider (82%), their worries about the disease were seriously addressed by the provider (84.8%), and they thought that they had enough privacy during the examination (80.5%). Over half (58.4%) of the patients stated that they were worried that other patients could hear their conversation with the provider, and 69.7 percent stated that the provider explained how to cope with their problems (Table 13).

Table 13. Patient-reported interactions with healthcare providers

	Type of TB				Total	
	DS-TB		DR-TB			
	Yes*	%	Yes	%	Yes	%
Do the healthcare providers usually explain things in a way you can understand?	445	93.9	11	84.6	456	93.6
Do the healthcare providers listen to your opinion and ideas on the best way to follow your treatment?	440	93.6	12	92.3	452	93.6
Do the healthcare providers at this facility discuss your status or progress with you at every scheduled appointment?	395	85.9	11	84.6	406	85.8
Do you think the healthcare providers give you a chance to ask questions about anything that concerns you?	405	86.4	12	92.3	417	86.5
Do you usually have enough time to discuss your health needs with the healthcare providers?	380	81.9	11	84.6	391	82
Do the healthcare providers tell you how this disease can affect your everyday life?	347	74.6	9	69.2	356	74.5
Do the healthcare providers at this facility address your worries about your disease seriously?	386	84.8	11	84.6	397	84.8
Do the healthcare providers listen carefully to you?	426	91	12	92.3	438	91.1
Do the healthcare providers explain how to cope with your problems?	316	69.9	8	61.5	324	69.7
Do you worry that other patients can hear your conversation with your healthcare providers?	275	58.1	9	69.2	284	58.4
Do you think you have enough privacy during the examination?	379	80.1	12	92.3	391	80.5

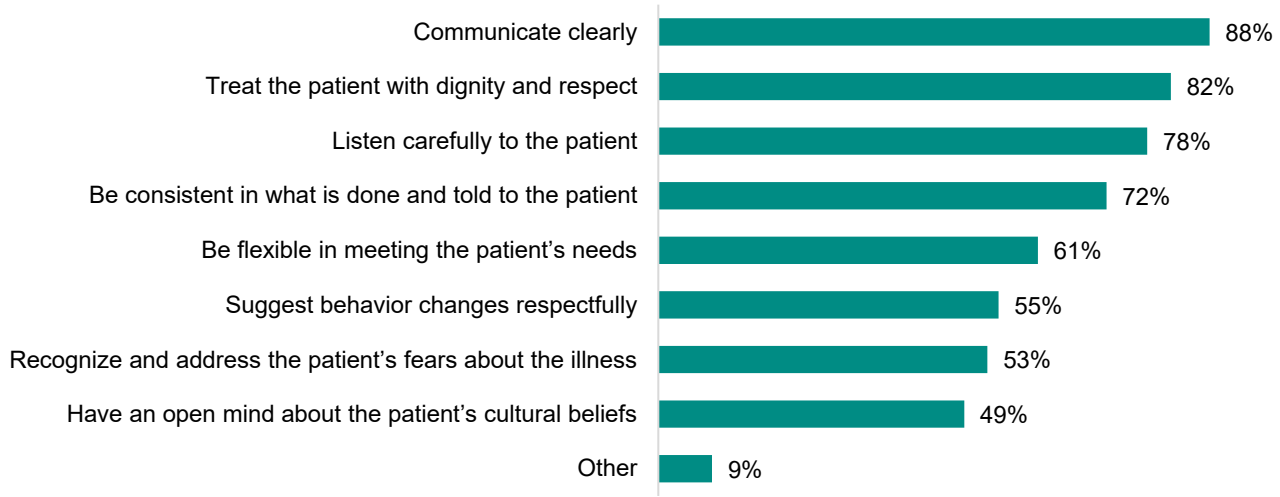
Note: Only patients who knew whether they had DS-TB or DR-TB were accounted for in these totals (patients who responded “do not know” were excluded from the totals). *Refers to the number of “Yes” responses.

During the patient interviews, patients were also asked about the information that providers shared with them. They were first asked unprompted without any answer options given to them, and then prompted with answer options that they initially did not provide. More than 80 percent of the patients (prompted and unprompted) noted that they had received information on TB transmission, cough hygiene, that TB could be cured, how long the treatment would last, the importance of taking medicines regularly, the importance of taking medicines through the end of the treatment period, and when to come back for the next visit. More than 75 percent of patients stated that they were given information on the need for sputum tests throughout treatment (77.9%) and side effects of TB treatment (77.2%). More than 60 percent of patients reported that they had received information on the danger signs of TB (64.5%) and what to do if they had side effects from the medicine (67.5%). Despite an overall reported high percentage of verbal information being given to patients by providers, only 22.3 percent of patients said that they had received materials on TB from the health facility (Appendix C, Table C6).

3.3.2. Provider Perspective

Providers were asked, unprompted, what they did to build trust and establish good rapport with patients. More than 80 percent of the 429 providers surveyed stated that they communicated clearly with patients and treated patients with dignity and respect. At least half of the providers reported that they listened carefully to patients, were consistent in what was done and what they told patients, were flexible in meeting the patients' needs, suggested behavior changes respectfully, and recognized and addressed patients' fears about the illness. Slightly less than half (49%) of providers said that they had an open mind about the patients' cultural beliefs (Figure 21). Urban, peri-urban, and rural providers gave similar responses, with a higher percentage of rural providers answering yes for each question (data not shown).

Figure 21. How TB providers establish rapport with patients (n=429)



Providers were also surveyed about what they asked patients during the initial assessment to determine the patients' understanding of TB. Overall, 60 percent or more of the providers stated that they asked their patients about their general knowledge of TB, their ability to follow the TB

treatment plan and their previous medical/psychosocial history. In some cases, differences were observed in the responses given by providers at the three different facility types. For instance, more than 40 percent of providers at HCs (52.5%) and hospitals/hospital centers/clinics (42%) asked patients about potential barriers to treatment (lack of transportation and TB medications being too expensive, etc.), whereas only 24.7 percent of providers at RHCs asked for the same information. Similarly, 60 percent of providers at HCs and 47.6 percent of providers at hospitals/hospital centers/clinics, but less than 30 percent of providers at RHCs, asked about patients' attitudes and beliefs about TB (Table 14).

Table 14. Provider-reported interactions with patients

	Facility Type						Total (n=428)	
	Hospital (Tertiary)		RHC (Secondary)		HC (Primary)			
	No.	%	No.	%	No.	%	No.	%
As part of the initial patient assessment to determine their understanding of TB, what do you ask the patient to tell or explain to you?								
Patient's previous medical and psychosocial history	87	60.8	38	44.7	152	76	277	64.7
Attitudes/beliefs toward TB	68	47.6	22	25.9	120	60	210	49.1
Knowledge of TB	114	79.7	57	67.1	171	85.5	342	79.9
Ability to follow the TB treatment plan	93	65	37	43.5	143	71.5	273	63.8
Potential barriers to treatment (lack of transportation, TB medications will be too expensive, etc.)	60	42	21	24.7	105	52.5	186	43.5
Resources, (e.g., family, other social support, finances)	59	41.3	26	30.6	110	55	195	45.6
Other	7	4.9	5	5.9	8	4	20	4.7

Providers were also assessed on the type of information or topics they discussed with patients (unprompted). Results disaggregated by provider occupational category are included in Appendix C, Table C7. More than three-quarters reported that they discussed general TB information (test results, what the test results meant, how TB is spread to others, and that TB can be cured), the need for a treatment supporter, how long treatment will last, the treatment phase they were in, treatment status or progress, how the medications should be taken (dosage, frequency, etc.), the importance of taking medications for the full course of treatment, options available for treatment support (e.g., DOT), and possible side effects of TB medication. Almost three-quarters of the providers reported telling patients what to do if they ran out of their medication (74.4%) and what to do if they experienced side effects from TB medication (74.1%) (Table 15).

Table 15. Provider-reported topics discussed with patients (unprompted)

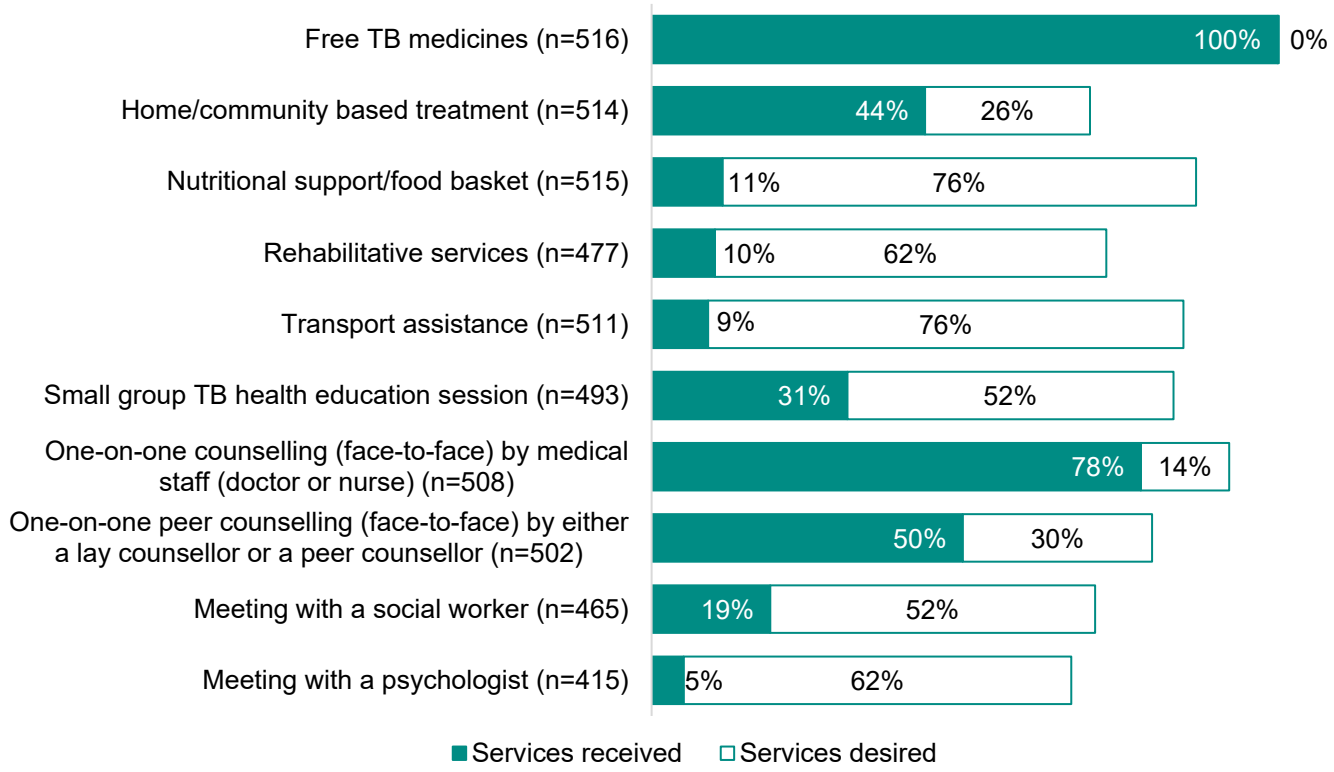
	Facility Type						Total (n=429)	
	Hospital (Tertiary)		RHC (Secondary)		HC (Primary)			
	No.	%	No.	%	No.	%	No.	%
General TB Information								
Test results	124	86.1	64	75.3	176	88	364	84.8
What the test results mean	115	79.9	55	64.7	170	85	340	79.3
How TB is spread to others	128	88.9	72	84.7	183	91.5	383	89.3
That TB can be cured	130	90.3	68	80	190	95	388	90.4
TB Treatment Information								
The need for a treatment supporter	110	76.4	52	61.2	164	82	326	76
How long treatment will last	127	88.2	72	84.7	187	93.5	386	90
The treatment phase they are in	112	77.8	51	60	167	83.5	330	76.9
Treatment status or progress	107	74.3	49	57.6	168	84	324	75.5
How the medications should be taken, (dosage, frequency, etc.)	124	86.1	71	83.5	175	87.5	370	86.2
Importance of taking medications for the full course of treatment	122	84.7	65	76.5	179	89.5	366	85.3
Options available for treatment support, (e.g., DOT)	110	76.4	51	60	162	81	323	75.3
What to do if they run out of their medication	109	75.7	56	65.9	154	77	319	74.4
Possible side effects of TB medication	113	78.5	52	61.2	176	88	341	79.5
What to do if they experience side effects from the TB medication	108	75	53	62.4	157	78.5	318	74.1

3.4. Patient Satisfaction

3.4.1. Desired Versus Received Services

Patients were asked to indicate the TB services they desired versus the services they actually received during their treatment. All patients who wanted free TB medicines received them, and 78 percent of patients who indicated that they wanted one-on-one counseling (face-to-face) with medical staff received it. However, there were wide discrepancies between the other services patients desired and those they actually received. The biggest discrepancies were in transport assistance; 84.8 percent of patients expressed a desire but only 9 percent were actually given assistance. Similarly, there were big differences regarding nutritional support and food baskets, rehabilitation services, and meeting with a psychologist (Figure 22).

Figure 22. Comparison of TB services received vs. desired by TB patients

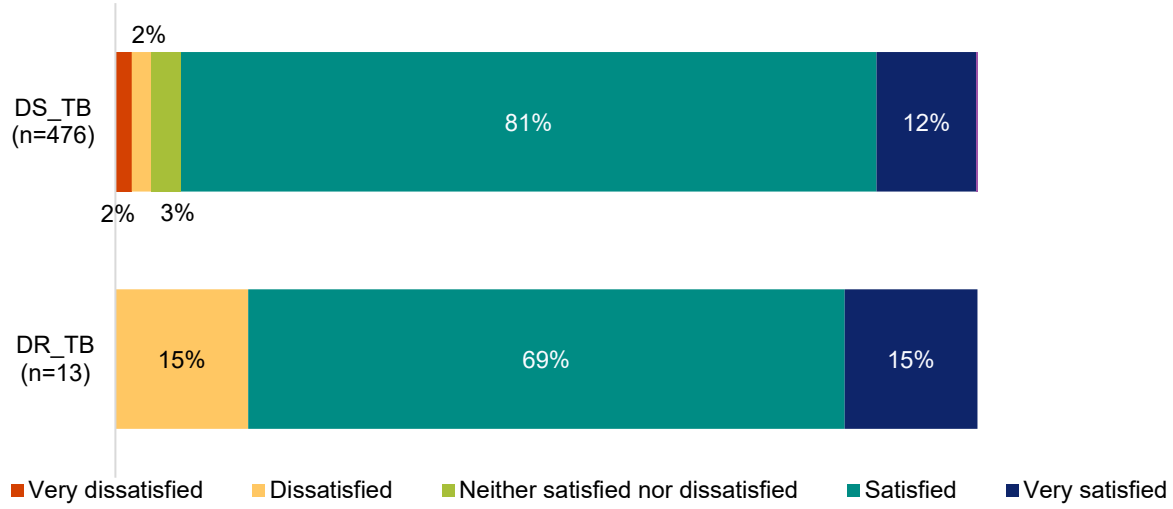


Note: Total number of respondents (N) varies by the type of services offered

3.4.2. Overall Satisfaction

Patients were also asked about their overall satisfaction with the treatment services that they had received using a Likert scale, with one being "very dissatisfied" to five being "very satisfied". The results showed a high level of patient satisfaction despite many patients not receiving all the services that they desired. Around 85 percent of patients overall were either satisfied or very satisfied with the services that they had received. More DS-TB patients indicated that they were satisfied (92.3% vs. 84.6%), whereas more DR-TB patients indicated that they were dissatisfied (15.4% vs. 4.2%) (Figure 23).

Figure 23. Overall patient satisfaction with TB care received at facility, by patient type



4. Outcome Indicators

The following section presents findings on the TB cascade of care and TB outcome indicators. Data collected through the patient interviews and register reviews provided information on TB prevention and treatment outcomes.

4.1. Care-Seeking, Diagnosis, and Treatment Initiation

Nearly two-thirds (63.6%) of patients waited more than two weeks after experiencing TB signs and symptoms to seek care at a health facility. Overall, 69.2 percent of patients indicated receiving test results confirming TB within two days of testing. Only 7.3 percent waited more than one week after being tested to receive their results. After being diagnosed, 79.2 percent of patients reported that they initiated treatment within two days (data not shown).

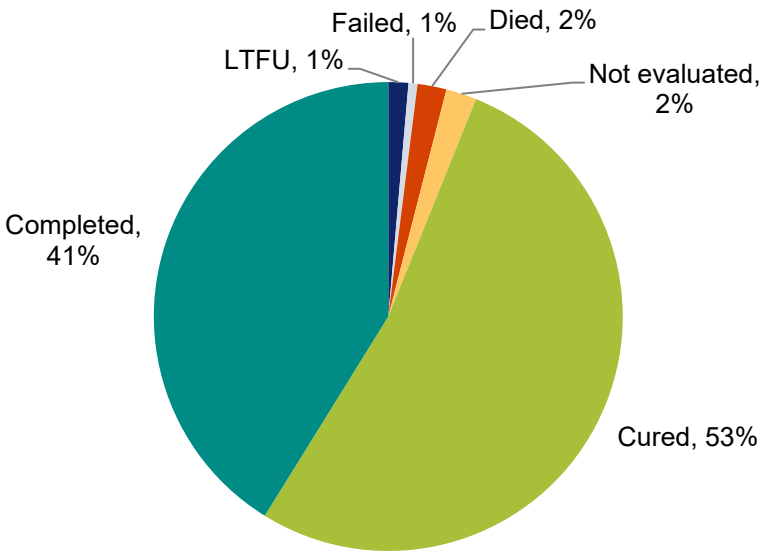
Patients were also asked about the availability and role of treatment supporters. The majority of patients (62.4%) reported that a health worker at the facility supervised their treatment whereas 29.7 percent mentioned a family member playing that role. The remaining patients were supported by others, such as a health worker in the community (data not shown).

4.2. DS-TB Outcomes

The treatment outcomes for DS-TB were assessed using the TB Treatment Register. Data for all DS-TB patients who started TB treatment between January 1, 2021, and March 31, 2021, and had an outcome recorded were reviewed and included in the calculation.

As shown in Figure 24, 53 percent of the 5,157 DS-TB patients were cured, and 41 percent completed treatment, giving a TSR of 94 percent. One percent each were recorded as having treatment failure or being lost to follow-up (LTFU). Two percent of patients died and another two percent were not evaluated. Appendix B provides definitions for each treatment outcome.

Figure 24. Treatment outcomes for DS-TB patients (n=5,157)

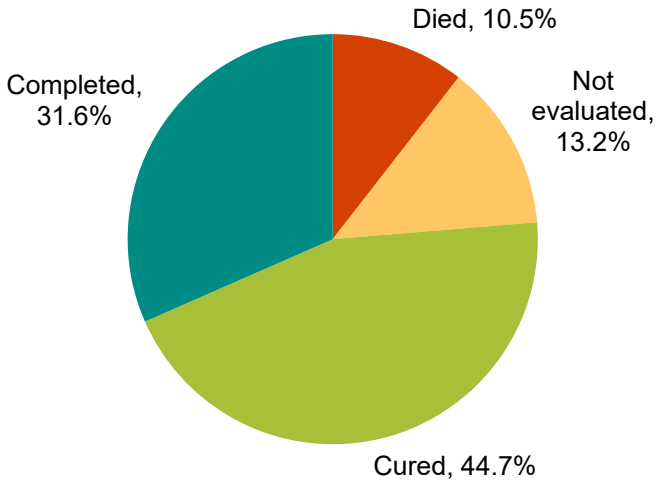


4.3. DR-TB Outcomes

TB treatment outcomes for DR-TB were assessed using the DR-TB Patient Treatment Register. Data for all DR-TB patients who started TB treatment between January 1, 2021, and March 31, 2021, and had an outcome recorded were reviewed and included in the calculation.

As Figure 25 shows, 45 percent of the 76 patients treated for DR-TB were recorded as cured, in addition to the 32 percent of patients recorded as completing DR-TB treatment. Eleven percent of patients were recorded as having died during treatment, and the remaining 13 percent were not evaluated and did not have an outcome recorded.

Figure 25. Treatment outcomes for DR-TB patients (n=76)



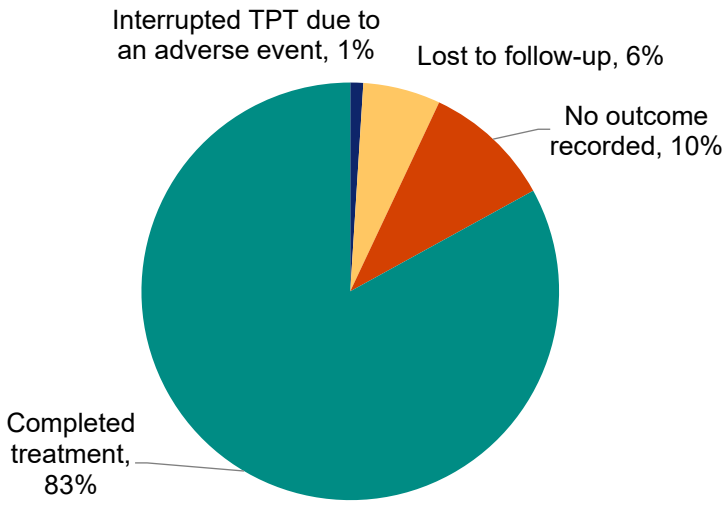
4.4. TPT Outcomes

Outcomes for TPT were assessed for child contacts under the age of 15 and people living with HIV (PLHIV) using the TPT Register. Data for all child contacts and PLHIV who started TB treatment between January 1, 2021, and March 31, 2021, and had an outcome recorded were reviewed and included in the calculation.

4.4.1. TPT Outcomes for Child Contacts

The majority of the 545 children who initiated on TPT were recorded as having completed the six-month regimen (83%). About 10 percent of children had no outcome recorded, and 6 percent were LTFU. A very small proportion of children were recorded as having stopped TPT due to an adverse event (1%) and dying during treatment (0.2%) (Figure 26).

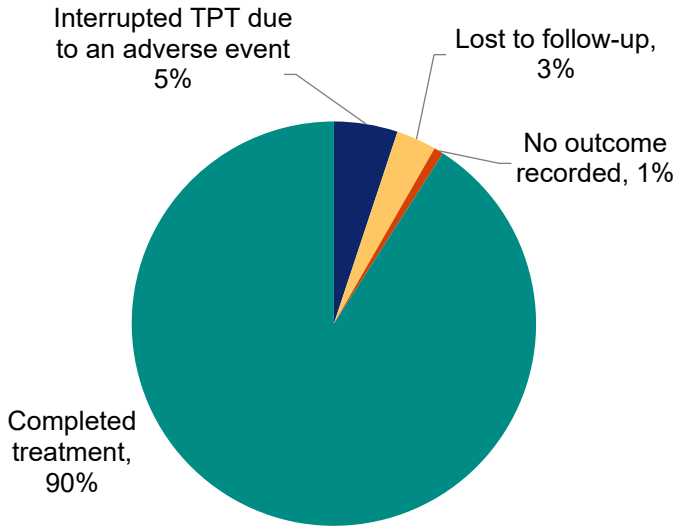
Figure 26. TPT outcomes for child contacts (n=545)



4.4.2. TPT Outcomes for PLHIV

Most of the 535 PLHIV who initiated on TPT were recorded as having completed treatment (90.1%). Five percent were listed as having stopped TPT due to an adverse event, and 3.2 percent of PLHIV were recorded as having been LTFU. A small percentage of PLHIV either died during treatment (0.4%) or no outcome was recorded (0.7%) (Figure 27).

Figure 27. TPT outcomes for PLHIV (n=535)



Successes, Challenges, and Limitations

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

Successes

An important success of the QTSA was the collaboration with POSAF, who was an instrumental partner in training the data collection teams on the QTSA tools and overseeing the data collection process. Very few studies of this scale are implemented in the DRC due to the challenges unique to the rural DRC context. The Yuki CDT in the Oshwe HZ (Maï-Ndombe province) had not received provincial supervision in 15 years due in large part to poor or impassable roads, an absence of villages along the route, and long travel time from nearby cities but were able to be included in the QTSA, which speaks to the success of the planning, organization and training for the survey. The success of the QTSA is due in large part to the dedication of the field investigators and the investment and engagement of local authorities.

Months of preparation for the data collection by TB DIAH and POSAF, under the guidance of the PNLT and USAID Mission and support from other partners, focused on ensuring that the assessment could proceed under difficult conditions, including challenges such as lack of electricity and connectivity in many parts of the country and potentially unsafe travel routes and poor transportation infrastructure.

This careful planning allowed for data collection team leads to be well-equipped to handle potential challenges. For example, security issues in areas of Maniema necessitated negotiations between local representatives and the Mai-Mai rebel leader to secure safe passage for the data collection teams. In Sud-Ubangi, an attempted assassination of the Bogosse HZ head doctor (*médecin chef de zone)* resulted in increased security by provincial authorities, which aided the data collection team in reaching the sampled CDTs.

Furthermore, to make sure that the assessment would be well tailored to the parts of the country visited, the sampled zones for the data collection areas were thoroughly studied so that all the materials would be available in the languages spoken by the people with TB visiting those facilities and adapted to the hurdles posed by the transportation methods. Indeed, one of the advantages conferred by the electronic data collection is that the teams could collect data on their tablets in real time using the SurveyCTO application, which was linked to the TB DIAH server. Data collection teams found this digital tool beneficial in terms of speed, efficiency, user-friendliness, data security, and above all, ease of mobility in view of the often-precarious travel conditions, which for all teams was mostly done on motorcycle, and for some teams by boat.

The data collection teams were well-trained and prepared. Their collaboration with provincial authorities was critical to the success of the QTSA. Provincial partners' involvement included the training of data collectors, mobilization of respondents in sampled facilities, contacting TB focal points, and assisting in making source documentation needed for data collection available. Facilities were sent reminders of the upcoming QTSA visit so as to ensure the availability of respondents (providers, patients, and community actors) and the needed source documents.

Local political and administrative authorities were invaluable in conflict zones (e.g., Maniema province), helping to integrate collection teams into the communities and ensuring their safety.

Challenges

Time required to conduct the study: Although the QTSA data collection was completed within eight weeks, 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 more than one year, which was longer than expected. Data verification and cleaning also took longer than anticipated. 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 TB-related 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.

Access issues: Accessing health facilities to collect data in remote parts of the DRC, which were often only reachable by dirt path or waterway, presented serious challenges to the data collection teams. Some sites were so remote that they had not received an outside visit in a decade. Most of the roads traveled were in very poor condition and travel times were long.

Security concerns: Civil unrest, domestic terrorism, and political instability were causes for concern in some settings and were challenges specific to the DRC.

Poor infrastructure: Across the six provinces, many data collection teams faced issues related to the lack of electricity (and therefore Internet connectivity), including at some of the lodging spots, which made it difficult and sometimes impossible for the data collection teams to submit collected data on a daily basis as per the data collection protocol.

Limitations

Since the QTSA relies on self-reported practices of TB providers, there is the possibility that the providers may have overstated the true incidence of how often they implement “correct” practices and/or their practices to build rapport and trust with people with TB receiving care at the health facilities assessed, in an effort to make a favorable impression in the study. Some parts of the patient interview tool were designed to mirror the provider interview tool, to allow the study team to cross-check practices reported by providers against practices reported by patients.

The patients targeted for interviews were primarily those who came to the facility on the day of the assessment. The study’s design used this method to eliminate bias that would have resulted if providers were asked to recruit patients. Nevertheless, it still left room for potential selection bias since the team was not able to interview patients who did not frequent health facilities, such as those who received treatment at the community level, those who had stopped treatment, or

those considered LTFU. The patients 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.

Moreover, recall bias may have occurred during patient interviews. The data collection team solicited information about patients' experiences with TB services. However, patients may not remember the sequence and content of counseling and clinical evaluation sessions in the course of diagnosis and treatment, especially given the long time needed to complete TB treatment. For this reason, the Patient Interview included a limited number of questions focused on each patient's satisfaction and perception of the care they received. Additionally, it was often difficult for the data collection teams to meet 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 and often the providers selected the patients who were called, which may have introduced bias.

One last possible bias related to the Patient Interview was the potential for desirability or courtesy bias as 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 where they were surrounded by the service providers from whom they normally received services. It is possible that patients may have conveyed an image of quality that was better than reality. Patients could feel inclined to say positive things about the services they had received because they may have feared that negative feedback would threaten their continued receipt of services at the facility. To minimize this bias, data collectors were trained to assure patients that they were free to express their opinions honestly, without fear of losing access to services at the facility. It was also encouraged, during data collection training, that Patient Interviews take place in areas removed from the care units (for example, an unoccupied outdoor area or an empty waiting room). Investigators also emphasized the importance of keeping patients' responses confidential to minimize the sharing of opinions and experiences beyond the interview. Further studies using qualitative methods are recommended to delve deeper into the issues of stigma and discrimination.

Finally, and more broadly, generalizability measures the degree to which results from a sample can be extended to a population as a whole. The sampling design for this study required that the sample be selected from populations in such a way that the sample matched the characteristics of the population as closely as possible. The results of the closely matched samples were nationally representative and could be used to generate national estimates.

Recommendations

In November 2022, TB DIAH and POSAF jointly organized a data validation and consensus meeting with the PNLT and other TB stakeholders in the DRC, during which the preliminary results of the QTSA/DQR were presented, followed by the joint establishment of key recommendations. The recommendations can be summarized in eleven categories as follows:

1. Availability of complete, accurate, and timely data

TB registers are not available in many facilities and there is widespread lack of standardization data collection practices and reporting tools. These tools also require frequent updates to align with the indicators that the country is expected to report per global guidance (e.g., WHO). Although the tools may be updated at the central level, it is important to note that there is often a gap between what is available at the central level and what is actually being used in the field. The recommendation is to standardize and streamline the use of TB data collection and reporting tools by training facility personnel on their proper use, making the tools readily available, developing tools that can stay in good physical condition over the course of their use, and re-equipping facilities with up-to-date information and copies of registers and reporting forms when the tools undergo modifications.

2. Human resources

The medical workforce in the DRC is aging. The new generation of medical professionals are not comprehensively trained and have not yet taken over from older professionals. There is concern that there is not enough overlap between more senior and younger professionals to ensure the transfer of knowledge and institutional memory. Indeed, the QTSA data indicate that 45 percent of providers are older than 45 years old whereas those younger than 34 years old represent only 18.2 percent of the providers interviewed. Furthermore, the robustness of medical training is lacking in many parts of the country. The recommendation is to strengthen the medical training programs and schools and to develop more mentorship opportunities in the field, such as pairing senior physicians with early career doctors and building robust mentor-mentee relationships for nurses at the facility level, to enable a smoother and more complete transfer of knowledge and succession.

3. Localization

Many TB staff working in more remote areas have little if any access to training, supervision, coaching, and guidance. Training workshops and activities are heavily centralized. The PNLT would benefit from a decentralized, localized approach to managing human resources and skill building. The recommendation is to equip the zonal level with the resources they need to oversee and lead skill building of their medical personnel more autonomously without relying on the central level.

4. Patient knowledge

The DRC QTSA revealed gaps in patients' knowledge of TB. The recommendation is to better train providers in what information should be communicated to patients throughout the cascade of care, from screening and diagnosis through treatment initiation and completion.

5. Adherence to algorithms and standard operating procedures

TB diagnosis algorithms and standard operating procedures (SOPs) for laboratories are not being followed or only being loosely followed. More than two-thirds of facilities (68.3%) were unable to produce SOPs for specimen collection and just 15 percent of facilities had received new or revised diagnostic, lab, and/or treatment algorithms, protocols, or procedures since the onset of COVID-19. Providers at half of the facilities visited (49.3%) had received training on TB screening algorithms in the last 24 months. The QTSA validation meeting participants recommended stronger enforcement and adherence to PNLT algorithms and SOPs for the laboratory for early detection of TB and drug resistance.

6. Equipment

Basic infrastructure is lacking in many facilities, including running water and electricity, and laboratory and pharmacy equipment and supplies are missing at many sites. Diagnostic tools in particular, (microscopes, GeneXpert, and X-ray machines) are very limited in quantity. Microscopy is available at only 27.5 percent of hospitals and 39.5 percent of HCs, and a little more than half (54.2%) of RHCs. Just over half of RHCs (58.3%), and peri-urban (58.8%) and rural (57.9%) CDTs had access to GeneXpert. Second-line DST was available at only one-third of hospitals (37.3%), RHCs (33.3%), and rural CDTs (32.7%). Fewer than 10 percent of CDTs screened for TB by X-ray or diagnosed TB by X-ray or GeneXpert. The recommendation is that the PNLT should work with their provincial and HZ staff to provide the equipment needed by CDTs. In the context of Ebola and COVID-19, facilities must also have adequate personal protective equipment for providers and clients. For example, only 24.2 percent of the facilities had surgical masks available for confirmed and presumptive TB patients.

7. Access to TB resources in peripheral facilities

Related to the localization and equipment issues outlined above, health facilities at the peripheral level receive notably fewer materials and supplies than do facilities in central, well-connected, urban areas. There were concerns highlighted in the QTSA, with as many as 55 percent of TB data collection tools being improvised. The PNLT should ensure that standardized and updated tools are available in sufficient quantities and consistently used across the country and not just in urban hubs. This applies to the availability of registers, data collection forms, and job aids, but also to the drug supply chain as drug stockouts were more likely at the peripheral level. This issue is related to training providers in forecasting, quantification, and supply management so staff know how and when to order TB medications and supplies.

8. Person-centered care

The way in which TB services are currently implemented does not sufficiently focus on the client receiving care for TB. The QTSA data validation meeting participants stressed the importance of creating a climate that promotes person-centered care, namely, in patient-provider interactions, and with support from CHAs. This is related to the frequency and quality of provider training (including refresher training) and supervision visits, and further enabling providers to learn new techniques, including from their peers, and apply those techniques with their own clients. Facility supervisors, in turn, should be more engaged in monitoring the quality of patient-

provider interactions, and offering providers feedback, strategies, and approaches for improving person-centered TB care.

9. Gender

In the DRC, women are still largely underrepresented in the medical field. The QTSA data revealed that only 19.1 percent of healthcare providers and 21.8 percent of CHAs interviewed were women. Increasing young women's access to medical education and supporting them to follow a career in medicine (by providing all other crucial support they may need, including scholarships, mentorship, and shadowing/internship opportunities, etc.) could enable DRC to start seeing a more gender balanced medical workforce, and in so doing, perhaps enable more female clients to health facilities, including people with TB, to feel more comfortable seeking diagnosis and treatment services.

10. Treatment success rates (TSR)

There is a need to highlight the importance of following TB patients throughout the cascade of care and ensure that recommended bacteriological tests are done at the end of treatment to evaluate outcomes. The QTSA findings indicate a 94 percent TSR for DS-TB patients, which matches the national reported TSR of 94 percent (WHO, 2021), and a 77 percent TSR for DR-TB. The following is a breakdown of the TSR by cure and treatment completion: of the DS-TB patients, 41 percent completed their treatment, and 53 percent were cured. For the cured and completed treatment, the corresponding percentages for DR-TB were 45 percent and 32 percent, respectively. Furthermore, the QTSA findings show that 13 percent of DR-TB cases in the DRC have no outcome assigned at the end of treatment. Treatment for DR-TB often has toxic side effects which can lead to treatment interruption and incomplete therapy, which can in turn increase the risk of treatment failure and result in disease relapse, further transmission, and the development of further drug resistance.

11. Partners coordination

Partners involved in TB activities in the DRC should improve their coordination, speak with each other more frequently to work efficiently, reduce redundancies, and learn from each other's experiences, challenges, and best practices. At the central and provincial levels, partners should work together and coordinate with the PNLT to form functional M&E task forces to better align their goals and objectives, as well as to share findings that can be mutually beneficial.

Conclusion

The DRC QTSA results highlighted strengths and weaknesses in the quality of the PNLT services. The study showed strengths in terms of availability of services, laboratory infrastructure, drug availability, provider knowledge and counseling of patients, patient knowledge and satisfaction, and DS-TB treatment success for the facilities where registers were available and complete. The study also identified programmatic gaps, for example, diagnostic delays, sub-optimal DR-TB treatment outcomes, lack of training, and limited availability of educational materials and complete registers at facilities. These findings, combined with the recommendations drafted during the data validation meeting, presented above, provide evidence of the key elements that the PNLT should target to improve the availability of high-quality TB care services across the DRC and optimize patient treatment outcomes.

Following the completion of the DRC QTSA, data from the study are being used to develop a new National Strategic Plan and to inform the PNLT's Global Fund applications. Both USAID and the Global Fund have drawn on QTSA results to inform their activities—the Tuberculosis Implementation Framework Agreement (TIFA) in the case of USAID and provider skill building in the case of the Global Fund.

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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.

SurveyCTO allowed for real-time data management as the tools were being administered at the facility level. 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 data management team so that the data set 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 and difficult weather and access conditions.

The data management team conducted spot checks during the data collection period. One spot check was done per data collection team. During the spot checks, the implementation of protocols and the administration of the tools were assessed. The data management team had a checklist to assess the implementation of protocols and observed the datasets submitted by the team supervisors as well as the quality of individual data for each of the data collectors, since each data collector was in charge of one of the QTSA tools. The spot checks were also a means through which the data management team 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 data management team. 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 TB DIAH and the POSAF team on the progress of data collection. It contained the number of health facilities visited, the number of interviews (provider, patient, and community actor) 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 TB DIAH to make necessary changes to the tool(s), and to clarify the protocols for certain questions to ensure clean and comparable 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 data management team member 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 DOT facility and whose treatment outcome is unknown.

Source: Adapted from WHO, 2013

Appendix C. Additional Tables

Table C1. TB/HIV services provided by facilities, by facility type and location

	Facility Type						Facility Location						Total	
	Hospital (Tertiary)		RHC (Secondary)		HC (Primary)		Urban		Peri-urban		Rural			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Facility provides any HIV-related services (e.g., counseling, testing, care, or treatment) (n=227)	67	93.1	39	90.7	97	86.6	41	100	16	94.1	146	86.4	203	89.4
HIV-related services offered														
HIV testing and counseling for presumptive TB patients (n=203)	65	97	38	97.4	97	100	41	100	16	100	143	97.9	200	98.5
HIV testing and counseling for confirmed TB patients (n=203)	66	98.5	39	100	97	100	41	100	16	100	145	99.3	202	99.5
Recency testing for HIV (n=202)	66	100	39	100	97	100	41	100	16	100	145	100	202	100
HIV care and treatment services to TB/HIV coinfected patients (n=203)	65	97	38	97.4	89	91.8	40	97.6	15	93.8	137	93.8	192	94.6
Cotrimoxazole preventive therapy for TB/HIV coinfected patients (n=192)	62	95.4	37	97.4	85	95.5	40	100	15	100	129	94.2	184	95.8
Viral load testing for TB/HIV coinfected patients (n=192)	28	43.1	5	13.2	19	21.3	7	17.5	6	40	39	28.5	52	27.1
ART for TB/HIV coinfected patients (n=192)	61	93.8	32	84.2	83	93.3	40	100	14	93.3	122	89.1	176	91.7
Screening for symptoms of anti-TB and antiretroviral drug interactions (n=176)	46	75.4	16	50	66	79.5	37	92.5	11	78.6	80	65.6	128	72.7
TB preventive therapy (TPT) (n=203)	63	94	34	87.2	92	94.8	41	100	16	100	132	90.4	189	93.1

	Facility Type						Facility Location						Total	
	Hospital (Tertiary)		RHC (Secondary)		HC (Primary)		Urban		Peri-urban		Rural			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
INH (6, 9, 12 months or continuous) (n=189)	61	96.8	33	97.1	91	98.9	41	100	16	100	128	97	185	97.9
3HP (Rifampicin and INH) (n=189)	8	12.7	2	5.9	15	16.3	0	0	6	37.5	19	14.4	25	13.2
Q-TIB (cotrimoxazole, isoniazid, and vitamin B6) (n=189)	17	27	7	20.6	26	28.3	2	4.9	7	43.8	41	31.1	50	26.5

Table C2. IPC materials available at the health facility, by facility type and location

	Facility Type						Facility Location						Total (n=227)	
	Hospital (Tertiary)		RHC (Secondary)		HC (Primary)		Urban		Peri-urban		Rural			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Running water (piped, bucket with tap or pour pitcher)	55	76.4	32	74.4	76	67.9	32	78	14	82.4	117	69.2	163	71.8
Hand washing soap (may be liquid soap)	62	86.1	27	62.8	87	77.7	28	68.3	14	82.4	134	79.3	176	77.5
Alcohol-based hand rub	42	58.3	14	32.6	54	48.2	27	65.9	9	52.9	74	43.8	110	48.5
Medical waste receptacle (pedal bin) with lid and plastic bin liners	43	59.7	25	58.1	80	71.4	25	61	13	76.5	110	65.1	148	65.2
Other waste receptacle	62	86.1	39	90.7	93	83	38	92.7	16	94.1	140	82.8	194	85.5
Sharps container (i.e., safety box)	55	76.4	27	62.8	79	70.5	30	73.2	15	88.2	116	68.6	161	70.9
Disposable latex gloves	56	77.8	30	69.8	91	81.3	32	78	13	76.5	132	78.1	177	78
Disinfectant (e.g., chlorine, alcohol)	57	79.2	28	65.1	94	83.9	38	92.7	15	88.2	126	74.6	179	78.9

	Facility Type						Facility Location						Total (n=227)	
	Hospital (Tertiary)		RHC (Secondary)		HC (Primary)		Urban		Peri-urban		Rural			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Single use standard disposable syringes with needles or auto-disable syringes with needles	57	79.2	30	69.8	92	82.1	37	90.2	13	76.5	129	76.3	179	78.9
Gowns	62	86.1	29	67.4	98	87.5	38	92.7	14	82.4	137	81.1	189	83.3
Eye protection/goggles or face protection	17	23.6	3	7	17	15.2	7	17.1	4	23.5	26	15.4	37	16.3
Injection safety precaution guidelines for standard precautions	22	30.6	4	9.3	27	24.1	17	41.5	8	47.1	28	16.6	53	23.3
Needles destroyer	31	43.1	11	25.6	41	36.6	18	43.9	8	47.1	57	33.7	83	36.6
Methylated spirit and glycerin 70:30	30	41.7	9	20.9	32	28.6	11	26.8	8	47.1	52	30.8	71	31.3
N-95 and/or FFP2 respirators readily available for facility staff	14	19.4	10	23.3	17	15.2	5	12.2	2	11.8	34	20.1	41	18.1

Table C3. Patients' knowledge of TB risk factors, by type of TB

	Type of TB				Total (n=489)	
	DS-TB		DR-TB			
	No.	%	No.	%	No.	%
Way of living (lifestyle)						
No	71	14.9	2	15.4	73	14.9
Yes, prompted	213	44.7	3	23.1	216	44.2
Yes, unprompted	132	27.7	6	46.2	138	28.2
Don't know	60	12.6	2	15.4	62	12.7
Total	**476**	**100**	**13**	**100**	**489**	**100**
Smoking						
No	23	4.8	1	7.7	24	4.9
Yes, prompted	140	29.4	6	46.2	146	29.9
Yes, unprompted	271	56.9	6	46.2	277	56.6
Don't know	42	8.8	0	0	42	8.6

	Type of TB				Total (n=489)	
	DS-TB		DR-TB			
	No.	%	No.	%	No.	%
Total	**476**	**100**	**13**	**100**	**489**	**100**
Drinking alcohol						
No	48	10.1	1	7.7	49	10
Yes, prompted	133	27.9	5	38.5	138	28.2
Yes, unprompted	248	52.1	7	53.8	255	52.1
Don't know	47	9.9	0	0	47	9.6
Total	**476**	**100**	**13**	**100**	**489**	**100**
Fatigue						
No	202	42.4	3	23.1	205	41.9
Yes, prompted	139	29.2	7	53.8	146	29.9
Yes, unprompted	58	12.2	2	15.4	60	12.3
Don't know	77	16.2	1	7.7	78	16
Total	**476**	**100**	**13**	**100**	**489**	**100**
Malnutrition						
No	63	13.2	4	30.8	67	13.7
Yes, prompted	194	40.8	3	23.1	197	40.3
Yes, unprompted	178	37.4	6	46.2	184	37.6
Don't know	41	8.6	0	0	41	8.4
Total	**476**	**100**	**13**	**100**	**489**	**100**
Unhygienic practices						
No	115	24.2	6	46.2	121	24.7
Yes, prompted	225	47.3	6	46.2	231	47.2
Yes, unprompted	54	11.3	1	7.7	55	11.2
Don't know	82	17.2	0	0	82	16.8
Total	**476**	**100**	**13**	**100**	**489**	**100**
Poor ventilation						
No	153	32.1	4	30.8	157	32.1
Yes, prompted	210	44.1	8	61.5	218	44.6
Yes, unprompted	28	5.9	0	0	28	5.7
Don't know	85	17.9	1	7.7	86	17.6
Total	**476**	**100**	**13**	**100**	**489**	**100**
Pollution						
No	111	23.3	6	46.2	117	23.9
Yes, prompted	225	47.3	6	46.2	231	47.2
Yes, unprompted	50	10.5	1	7.7	51	10.4
Don't know	90	18.9	0	0	90	18.4
Total	**476**	**100**	**13**	**100**	**489**	**100**
Being HIV infected						
No	90	18.9	2	15.4	92	18.8

	Type of TB				Total (n=489)	
	DS-TB		DR-TB			
	No.	%	No.	%	No.	%
Yes, prompted	204	42.9	9	69.2	213	43.6
Yes, unprompted	63	13.2	2	15.4	65	13.3
No response	119	25	0	0	119	24.3
Total	**476**	**100**	**13**	**100**	**489**	**100**
Contact with or living with someone who has this disease						
No	78	16.4	2	15.4	80	16.4
Yes, prompted	250	52.5	8	61.5	258	52.8
Yes, unprompted	83	17.4	3	23.1	86	17.6
No response	65	13.7	0	0	65	13.3
Total	**476**	**100**	**13**	**100**	**489**	**100**
Inherited/genetic						
No	256	53.8	9	69.2	265	54.2
Yes, prompted	42	8.8	2	15.4	44	9
Yes, unprompted	13	2.7	1	7.7	14	2.9
No response	165	34.7	1	7.7	166	33.9
Total	**476**	**100**	**13**	**100**	**489**	**100**

Note: Only patients who knew whether they had DS-TB or DR-TB were accounted for in these totals (patients who responded “do not know” were excluded from the totals).

Table C4. Patients’ knowledge on TB symptoms, by type of TB

	Type of TB				Total (n=489)	
	DS-TB		DR-TB			
	No.	%	No.	%	No.	%
Chronic cough (more than 3 weeks)						
No	16	3.4	0	0	16	3.3
Yes, prompted	86	18.1	0	0	86	17.6
Yes, unprompted	367	77.1	13	100	380	77.7
Don't know	7	1.5	0	0	7	1.4
Total	**476**	**100**	**13**	**100**	**489**	**100**
Coughing up mucus or phlegm						
No	60	12.6	0	0	60	12.3
Yes, prompted	230	48.3	8	61.5	238	48.7
Yes, unprompted	160	33.6	4	30.8	164	33.5
Don't know	26	5.5	1	7.7	27	5.5
Total	**476**	**100**	**13**	**100**	**489**	**100**
Blood-streaked mucus or sputum						
No	131	27.5	1	7.7	132	27
Yes, prompted	218	45.8	10	76.9	228	46.6
Yes, unprompted	98	20.6	2	15.4	100	20.4
Don't know	29	6.1	0	0	29	5.9
Total	**476**	**100**	**13**	**100**	**489**	**100**
Unexplained weight loss						
No	19	4	0	0	19	3.9
Yes, prompted	236	49.6	8	61.5	244	49.9

	Type of TB				Total (n=489)	
	DS-TB		DR-TB			
	No.	%	No.	%	No.	%
Yes, unprompted	203	42.6	4	30.8	207	42.3
Don't know	18	3.8	1	7.7	19	3.9
Total	**476**	**100**	**13**	**100**	**489**	**100**
Loss of appetite						
No	62	13	1	7.7	63	12.9
Yes, prompted	217	45.6	7	53.8	224	45.8
Yes, unprompted	178	37.4	4	30.8	182	37.2
Don't know	19	4	1	7.7	20	4.1
Total	**476**	**100**	**13**	**100**	**489**	**100**
Fever and/or chills						
No	54	11.3	2	15.4	56	11.5
Yes, prompted	197	41.4	6	46.2	203	41.5
Yes, unprompted	208	43.7	4	30.8	212	43.4
Don't know	17	3.6	1	7.7	18	3.7
Total	**476**	**100**	**13**	**100**	**489**	**100**
Night sweats						
No	78	16.4	3	23.1	81	16.6
Yes, prompted	248	52.1	7	53.8	255	52.1
Yes, unprompted	119	25	2	15.4	121	24.7
Don't know	31	6.5	1	7.7	32	6.5
Total	**476**	**100**	**13**	**100**	**489**	**100**
Persistent shortness of breath						
No	75	15.8	0	0	75	15.3
Yes, prompted	238	50	8	61.5	246	50.3
Yes, unprompted	134	28.2	4	30.8	138	28.2
Don't know	29	6.1	1	7.7	30	6.1
Total	**476**	**100**	**13**	**100**	**489**	**100**
Tiredness or fatigue						
No	41	8.6	0	0	41	8.4
Yes, prompted	213	44.7	7	53.8	220	45
Yes, unprompted	211	44.3	4	30.8	215	44
No response	11	2.3	2	15.4	13	2.7
Total	**476**	**100**	**13**	**100**	**489**	**100**
Pain in the chest or back						
No	40	8.4	0	0	40	8.2
Yes, prompted	208	43.7	7	53.8	215	44
Yes, unprompted	206	43.3	5	38.5	211	43.1
No response	22	4.6	1	7.7	23	4.7
Total	**476**	**100**	**13**	**100**	**489**	**100**
Other						
No	303	63.7	8	61.5	311	63.6
Yes, prompted	18	3.8	0	0	18	3.7
Yes, unprompted	90	18.9	4	30.8	94	19.2
No response	65	13.7	1	7.7	66	13.5
Total	**476**	**100**	**13**	**100**	**489**	**100**

Note: Only patients who knew whether they had DS-TB or DR-TB were accounted for in these totals (patients who responded “do not know” were excluded from the totals).

Table C5. Patients' perspective on stigma and discrimination, by type of TB

	Type of TB				Total (n=489)	
	DS-TB		DR-TB			
	No.	%	No.	%	No.	%
Overall, I feel welcome in this health facility.						
Strongly agree	168	35.3	6	46.2	174	35.6
Agree	289	60.7	7	53.8	296	60.5
Neither agree nor disagree	8	1.7	0	0	8	1.6
Disagree	8	1.7	0	0	8	1.6
Strongly disagree	3	0.6	0	0	3	0.6
Total	**476**	**100**	**13**	**100**	**489**	**100**
Overall, healthcare providers here treat me with respect.						
Strongly agree	141	29.6	4	30.8	145	29.7
Agree	314	66	9	69.2	323	66.1
Neither agree nor disagree	9	1.9	0	0	9	1.8
Disagree	9	1.9	0	0	9	1.8
Strongly disagree	3	0.6	0	0	3	0.6
Total	**476**	**100**	**13**	**100**	**489**	**100**
Overall, the healthcare providers are friendly to me.						
Strongly agree	101	21.2	3	23.1	104	21.3
Agree	253	53.2	7	53.8	260	53.2
Neither agree nor disagree	69	14.5	2	15.4	71	14.5
Disagree	35	7.4	1	7.7	36	7.4
Strongly disagree	18	3.8	0	0	18	3.7
Total	**476**	**100**	**13**	**100**	**489**	**100**
Overall, the healthcare providers treat me the same way I am treated when I receive care for other illnesses.						
Strongly agree	101	21.2	3	23.1	104	21.3
Agree	340	71.4	10	76.9	350	71.6
Neither agree nor disagree	26	5.5	0	0	26	5.3
Disagree	7	1.5	0	0	7	1.4
Strongly disagree	2	0.4	0	0	2	0.4
Total	**476**	**100**	**13**	**100**	**489**	**100**
Healthcare providers here turn their face away when speaking with me.						
Strongly agree	151	31.7	5	38.5	156	31.9
Agree	262	55	5	38.5	267	54.6
Neither agree nor disagree	14	2.9	0	0	14	2.9
Disagree	39	8.2	3	23.1	42	8.6
Strongly disagree	10	2.1	0	0	10	2
Total	**476**	**100**	**13**	**100**	**489**	**100**
People at this facility show discriminatory attitudes toward me because of my disease.						
Strongly agree	156	32.8	6	46.2	162	33.1
Agree	262	55	5	38.5	267	54.6
Neither agree nor disagree	16	3.4	1	7.7	17	3.5

	Type of TB				Total (n=489)	
	DS-TB		DR-TB			
	No.	%	No.	%	No.	%
Disagree	31	6.5	1	7.7	32	6.5
Strongly disagree	11	2.3	0	0	11	2.2
Total	**476**	**100**	**13**	**100**	**489**	**100**
Overall, I feel distressed, intimidated, or offended when interacting with healthcare providers at this facility.						
Strongly agree	165	34.7	6	46.2	171	35
Agree	251	52.7	6	46.2	257	52.6
Neither agree nor disagree	19	4	1	7.7	20	4.1
Disagree	32	6.7	0	0	32	6.5
Strongly disagree	9	1.9	0	0	9	1.8
Total	**476**	**100**	**13**	**100**	**489**	**100**

Note: Only patients who knew whether they had DS-TB or DR-TB were accounted for in these totals (patients who responded “do not know” were excluded from the totals).

Table C6. Information given by providers to patients, by type of TB

During your visits to this health facility, what information about this disease and its treatment was shared with you by the health workers?	Type of TB				Total	
	DS-TB		DR-TB			
	No.	%	No.	%	No.	%
How the disease is spread to others						
No	57	12	4	30.8	61	12.5
Yes, prompted	172	36.1	2	15.4	174	35.6
Yes, unprompted	239	50.2	7	53.8	246	50.3
No response	8	1.7	0	0	8	1.6
Total	**476**	**100**	**13**	**100**	**489**	**100**
Cough hygiene, (i.e., how to reduce the risk of making others sick by covering your mouth when you cough)						
No	48	10.1	2	15.4	50	10.2
Yes, prompted	189	39.7	4	30.8	193	39.5
Yes, unprompted	232	48.7	7	53.8	239	48.9
No response	7	1.5	0	0	7	1.4
Total	**476**	**100**	**13**	**100**	**489**	**100**
That this disease can be cured						
No	15	3.2	0	0	15	3.1
Yes, prompted	196	41.2	7	53.8	203	41.5
Yes, unprompted	263	55.3	6	46.2	269	55
No response	2	0.4	0	0	2	0.4
Total	**476**	**100**	**13**	**100**	**489**	**100**
How long your treatment will last						
No	27	5.7	1	7.7	28	5.7
Yes, prompted	165	34.7	7	53.8	172	35.2
Yes, unprompted	277	58.2	5	38.5	282	57.7
No response	7	1.5	0	0	7	1.4

During your visits to this health facility, what information about this disease and its treatment was shared with you by the health workers?	Type of TB				Total	
	DS-TB		DR-TB			
	No.	%	No.	%	No.	%
Total	**476**	**100**	**13**	**100**	**489**	**100**
Danger signs of the disease getting worse						
No	153	32.3	4	30.8	157	32.2
Yes, prompted	220	46.4	6	46.2	226	46.4
Yes, unprompted	85	17.9	3	23.1	88	18.1
No response	16	3.4	0	0	16	3.3
Total	**474**	**100**	**13**	**100**	**487**	**100**
The importance of taking the medicines regularly						
No	26	5.5	2	15.4	28	5.7
Yes, prompted	236	49.6	9	69.2	245	50.1
Yes, unprompted	210	44.1	2	15.4	212	43.4
No response	4	0.8	0	0	4	0.8
Total	**476**	**100**	**13**	**100**	**489**	**100**
Side effects of the medicine						
No	95	20	4	30.8	99	20.3
Yes, prompted	265	55.8	7	53.8	272	55.7
Yes, unprompted	103	21.7	2	15.4	105	21.5
No response	12	2.5	0	0	12	2.5
Total	**475**	**100**	**13**	**100**	**488**	**100**
What to do if you have side effects from the medicine						
No	140	29.4	4	30.8	144	29.4
Yes, prompted	248	52.1	9	69.2	257	52.6
Yes, unprompted	73	15.3	0	0	73	14.9
No response	15	3.2	0	0	15	3.1
Total	**476**	**100**	**13**	**100**	**489**	**100**
The need for the sputum tests at given points during your treatment						
No	89	18.7	5	38.5	94	19.2
Yes, prompted	246	51.7	5	38.5	251	51.3
Yes, unprompted	127	26.7	3	23.1	130	26.6
No response	14	2.9	0	0	14	2.9
Total	**476**	**100**	**13**	**100**	**489**	**100**
The importance of taking the medicines through the end of treatment						
No	20	4.2	4	30.8	24	4.9
Yes, prompted	273	57.4	6	46.2	279	57.1
Yes, unprompted	176	37	3	23.1	179	36.6
No response	7	1.5	0	0	7	1.4
Total	**476**	**100**	**13**	**100**	**489**	**100**
When to come back for the next care visit for this disease						
No	45	9.6	1	7.7	46	9.5
Yes, prompted	238	50.7	9	69.2	247	51.2

During your visits to this health facility, what information about this disease and its treatment was shared with you by the health workers?	Type of TB				Total	
	DS-TB		DR-TB			
	No.	%	No.	%	No.	%
Yes, unprompted	170	36.2	3	23.1	173	35.9
No response	16	3.4	0	0	16	3.3
Total	**469**	**100**	**13**	**100**	**482**	**100**
Do you have materials (e.g., pamphlets) from the health facility to remind you of the treatment information given by the provider or other facility staff?						
No	366	77.5	11	84.6	377	77.7
Yes	106	22.5	2	15.4	108	22.3
Total	**472**	**100**	**13**	**100**	**485**	**100**

Note: Only patients who knew whether they had DS-TB or DR-TB were accounted for in these totals (patients who responded "do not know" were excluded from the totals).

Table C7. Provider-reported topics discussed with patients (unprompted), by provider type

	Provider Type														Total (n=429)	
	Community Health Actor		Medical Assistant		Medical Doctor/Clinical Officer		Nursing Associate		Lab Technician		Registered Nurse		Other			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No	%
General TB Information																
Test results	3	100	17	89.5	24	72.7	39	92.9	187	84.6	65	83.3	29	87.9	364	84.8
What the test results mean	3	100	15	78.9	19	57.6	35	83.3	177	80.1	64	82.1	27	81.8	340	79.3
How TB is spread to others	3	100	18	94.7	25	75.8	40	95.2	199	90	70	89.7	28	84.8	383	89.3
That TB can be cured	3	100	19	100	26	78.8	41	97.6	203	91.9	66	84.6	30	90.9	388	90.4
TB Treatment Information																
The need for a treatment supporter	3	100	14	73.7	19	57.6	37	88.1	173	78.3	63	80.8	17	51.5	326	76
How long treatment will last	3	100	19	100	25	75.8	41	97.6	206	93.2	66	84.6	26	78.8	386	90
The treatment phase they are in	3	100	13	68.4	14	42.4	38	90.5	180	81.4	60	76.9	22	66.7	330	76.9
Treatment status or progress	3	100	13	68.4	14	42.4	36	85.7	179	81	58	74.4	21	63.6	324	75.5
How the medications should be taken, (dosage, frequency, etc.)	3	100	17	89.5	25	75.8	41	97.6	193	87.3	66	84.6	25	75.8	370	86.2
Importance of taking	3	100	17	89.5	25	75.8	40	95.2	192	86.9	62	79.5	27	81.8	366	85.3

	Provider Type														Total (n=429)	
	Community Health Actor		Medical Assistant		Medical Doctor/Clinical Officer		Nursing Associate		Lab Technician		Registered Nurse		Other			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
medications for the full course of treatment																
Options available for treatment support, (e.g., DOT)	3	100	14	73.7	13	39.4	35	83.3	176	79.6	56	71.8	26	78.8	323	75.3
What to do if they run out of their medication	3	100	16	84.2	18	54.5	34	81	168	76	56	71.8	24	72.7	319	74.4
Possible side effects of TB medication	3	100	16	84.2	17	51.5	36	85.7	186	84.2	59	75.6	24	72.7	341	79.5
What to do if they experience side effects from the TB medication	1	33.3	16	84.2	17	51.5	31	73.8	176	79.6	57	73.1	20	60.6	318	74.1

Table C8. Community-based TB services provided by CHAs

	Facility Type						Facility Location						Total	
	Hospital (Tertiary)		RHC (Secondary)		HC (Primary)		Urban		Peri-urban		Rural			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Facility works with community volunteers who support TB patients (n=227)	59	81.9	43	100	111	99.1	41	100	15	88.2	157	92.9	213	93.8
TB services provided by CHAs														
Education about TB in the community (n=213)	54	91.5	38	88.4	107	96.4	40	97.6	15	100	144	91.7	199	93.4
Screening for TB symptoms (n=213)	56	94.9	41	95.3	108	97.3	40	97.6	15	100	150	95.5	205	96.2
Referral for TB diagnosis (n=213)	56	94.9	42	97.7	108	97.3	40	97.6	15	100	151	96.2	206	96.7
Collection and transportation of specimens to a diagnostic laboratory (n=151)	25	59.5	8	33.3	63	74.1	33	89.2	14	93.3	49	49.5	96	63.6
Transportation of specimens to a diagnostic library (n=151)	27	64.3	10	41.7	69	81.2	33	89.2	15	100	58	58.6	106	70.2
Direct observation of treatment (DOT) (n=158)	38	86.4	24	85.7	83	96.5	37	97.4	9	90	99	90	145	91.8

	Facility Type						Facility Location						Total	
	Hospital (Tertiary)		RHC (Secondary)		HC (Primary)		Urban		Peri-urban		Rural			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Adherence counselling (n=213)	53	89.8	36	83.7	100	90.1	39	95.1	13	86.7	137	87.3	189	88.7
Trace or locate clients who miss follow-up visits (n=213)	54	91.5	34	79.1	106	95.5	40	97.6	14	93.3	140	89.2	194	91.1
Bring back clients who miss follow-up visits (n=213)	55	93.2	32	74.4	105	94.6	40	97.6	14	93.3	138	87.9	192	90.1
Contact tracing for confirmed TB patients (n=213)	53	89.8	31	72.1	103	92.8	40	97.6	15	100	132	84.1	187	87.8
Psychosocial support (n=213)	43	72.9	19	44.2	83	74.8	37	90.2	10	66.7	98	62.4	145	68.1
HIV testing and counseling (n=213)	19	32.2	6	14	28	25.2	5	12.2	5	33.3	43	27.4	53	24.9

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