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Factors associated with persistent low internal active tuberculosis screening in tuberculosis treatment centers: An exploratory qualitative study in the Koshibanda Health Zone, Democratic Republic of the Congo

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ABSTRACT

Introduction
Internal active screening (IAS) for tuberculosis (TB) constitutes a critical strategy for improving case detection within healthcare facilities. Despite its integration into certain Tuberculosis Screening and Treatment Centers (TSTCs), the detection rate remains low in the Koshibanda Health Zone.

Purpose
To identify the factors explaining the persistence of low implementation of internal active tuberculosis screening in Tuberculosis Screening and Treatment Centers.

Methods
An exploratory qualitative study was conducted among 43 healthcare providers, including seven in-depth interviews and five focus group discussions. Four focus groups comprised seven participants each, while one included eight participants. Purposive sampling was employed until data saturation was achieved. Deductive thematic analysis was performed using ATLAS.ti version 9 software, based on an analytical framework inspired by the World Health Organization (WHO) health system building blocks. Methodological rigor was ensured through data source triangulation and independent coding procedures.

Results
The study, conducted in two TSTCs in the Koshibanda Health Zone among seven key informants and 36 healthcare providers, revealed varying levels of knowledge regarding internal active tuberculosis screening and its still-limited implementation. The major barriers identified included structural deficiencies, low prioritization of internal active screening due to excessive workload, and a persistent gap between knowledge and practice, resulting in predominantly opportunistic rather than systematic screening practices. Furthermore, dysfunctions in the referral and counter-referral system significantly limited patient follow-up and continuity of care.

Conclusion
Despite generally adequate knowledge of internal active tuberculosis screening among healthcare providers, its implementation in the TSTCs of the Koshibanda Health Zone remains constrained by structural limitations, insufficient prioritization of screening activities, and discrepancies between knowledge and practice. Strengthening diagnostic capacity, ensuring the availability of essential supplies, improving human resources, and reinforcing supportive supervision could substantially enhance early case detection and support tuberculosis control programs.

INTRODUCTION

Tuberculosis (TB) is an infectious disease caused by *Mycobacterium tuberculosis* and transmitted primarily through airborne droplets. Approximately one-quarter of the global population is estimated to harbor latent TB infection, with a risk of progression to active disease, particularly within the first two years following infection (Abayneh et al., 2020; Coverage, 2023). Despite major therapeutic advances, TB remains a leading cause of morbidity and mortality worldwide.

According to the World Health Organization (WHO), an estimated 10.8 million individuals developed TB in 2023, resulting in approximately 1.25 million deaths (World Health Organization [WHO], 2024). The African region bears a disproportionate share of this burden, driven by the high prevalence of HIV, widespread poverty, and persistent health system constraints.

The Democratic Republic of the Congo (DRC) is classified among the high TB burden countries, ranking ninth globally and second in Africa. The country faces a triple burden of drug-susceptible TB, drug-resistant TB, and TB/HIV co-infection. Despite sustained efforts by the National Tuberculosis Control Program (NTCP), approximately 30% of TB cases remain undiagnosed annually, reflecting a substantial diagnostic gap (NTCP, 2020; WHO, 2021).

To address this gap, the WHO recommends internal active screening (IAS), defined as the systematic screening of all patients attending health facilities, regardless of their reason for consultation. This approach aims to reduce diagnostic delays, interrupt transmission chains, and improve treatment outcomes (Lardizabal & Reichman, 2017). Evidence from East African settings suggests that integrating IAS into quality improvement initiatives can significantly enhance TB case detection.

However, despite its proven effectiveness in certain contexts, implementation remains inconsistent and insufficiently documented in many low-resource settings, including the DRC. In particular, health system constraints, provider-related factors, and organizational barriers affecting IAS implementation in peripheral health zones remain underexplored.

In the Koshibanda Health Zone, two Tuberculosis Screening and Treatment Centers (TSTCs) integrated IAS in July 2023. Nevertheless, the TB detection rate reached only 76% in 2024, below the national target of 90%. This discrepancy highlights the presence of local barriers limiting the effectiveness of the strategy and underscores the gap between global recommendations and field-level implementation.

Accordingly, this study aims to provide an integrated analysis of the factors associated with low IAS performance, focusing on:

- healthcare providers' characteristics,
- knowledge, attitudes, and practices,
- and structural and organizational constraints within the selected TSTCs.

The study was guided by the following research question: What factors explain the persistence of low tuberculosis screening performance in the two TSTCs implementing internal active screening in the Koshibanda Health Zone?

METHODS

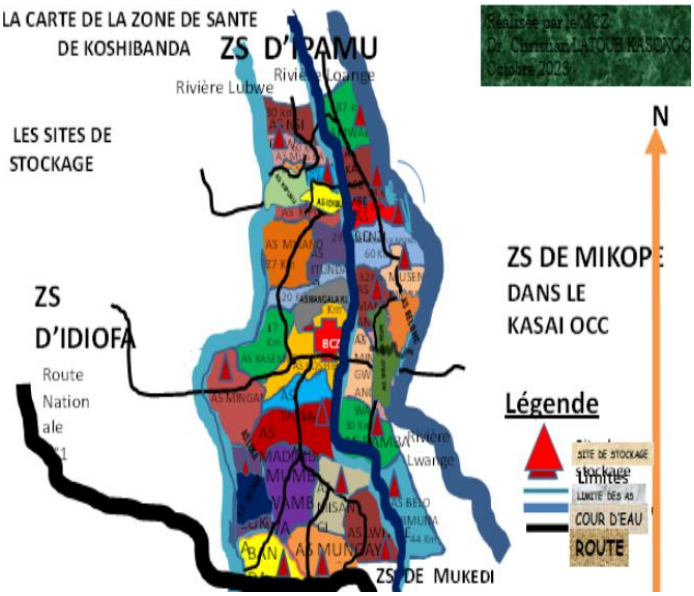
Study Design

An exploratory qualitative study was conducted to explore the factors associated with persistently low TB detection rates despite the implementation of a quality improvement approach.

Study Setting

The study was conducted from 25 October to 15 November 2025 in the Koshibanda Health Zone, Kwilu Province, western DRC. The zone covers 3,404 km² and has an estimated population of 274,454 inhabitants distributed across 33 health areas and 123 health facilities, including four TSTCs. Two TSTCs implementing the quality improvement approach were purposively selected.

Figure 1:
Map of the Koshibanda Health Zone.



Source: Koshibanda Health Zone.

Study Population

The study population consisted of healthcare providers involved in internal active TB screening activities.

Inclusion Criteria

Participants were included if they:

- worked in TSTCs trained or briefed on the quality improvement approach;
- were aged 18 years or older;
- had at least 12 months of experience in IAS implementation.

Exclusion Criteria

Healthcare workers with less than 12 months of continuous experience in IAS, or with service interruptions exceeding three months in the preceding year, were excluded.

Sampling and Sample Size

A purposive sampling strategy was used to recruit participants with relevant experience.

A total of 43 participants were included:

- 7 key informant interviews,
- 36 participants in five focus group discussions.

Sampling continued until data saturation was achieved.

Data Collection

Data were collected using semi-structured interview guides, focus group discussion guides, and documentary review. All interviews and discussions were audio-recorded with informed consent and transcribed verbatim.

Data Analysis

A deductive thematic analysis approach was employed. The process included transcription, data familiarization, coding using ATLAS.ti version 9, development of a coding framework aligned with study objectives, and grouping codes into categories and themes. Coding was independently performed by two researchers, with discrepancies resolved through consensus.

Trustworthiness

Methodological rigor was ensured through triangulation of data sources, standardized data collection tools, peer debriefing, audit trail documentation, and reflexivity throughout the research process.

Ethical Considerations

Ethical approval was obtained from the Ethics Committee of the Kinshasa School of Public Health (Approval No. ESP/CE/78B/2025). Written informed consent was obtained from all participants, and confidentiality and anonymity were strictly maintained.

RESULTS

Participant Characteristics

Forty-three participants were included: seven key informants and 36 healthcare providers participating in focus group discussions.

Key informants were exclusively male, with a median age of 45 years (IQR: 15). They included physicians (42.9%), nurses (42.9%), and laboratory technicians (14.3%), primarily occupying managerial or supervisory roles. Most had extensive professional experience, with 42.9% having more than 20 years of service.

Focus group participants had a median age of 39.4 years (IQR: 14). The majority were A1-level nurses (55.6%), with generally lower professional seniority compared to key informants.

Knowledge of Internal Active Screening

Understanding of the Concept

Understanding of IAS varied considerably. Some participants demonstrated accurate knowledge of IAS as systematic screening of all patients:

> *"Internal active screening means actively searching for suspected TB cases within the health facility."*

However, many participants equated screening only with symptomatic patients:

> *"All patients presenting with cough should be screened."*

Implementation Knowledge

Although IAS was widely recognized, its application remained largely theoretical and inconsistently implemented:

> *"We are supposed to screen all patients, but in practice, we often limit it to symptomatic cases."*

Attitudes Toward IAS

IAS was generally assigned low priority in routine clinical workflows:

> *"It is not a priority… other services come first."*

Motivation among healthcare providers was limited, largely due to lack of incentives:

> *"Low pay, low motivation."*

Nevertheless, participants acknowledged the importance of IAS for improving TB detection.

Screening Practices

IAS was not systematically implemented. Only a small proportion of providers reported universal screening, while most relied on symptom-based approaches:

> *"We mainly screen patients with cough because of time constraints."*

Barriers included workload, staff shortages, supply stock-outs, and weak referral systems:

> *"We do not have enough time or staff to screen every patient."*

Structural and Material Constraints

The absence of on-site GeneXpert testing was a major barrier, requiring sample referral over long distances:

> *"GeneXpert is more than 70 km away, making sample transport difficult."*

Frequent shortages of reagents and consumables were also reported:

> *"We often experience stock-outs of laboratory reagents."*

Staff shortages further exacerbated workload pressures:

> *"We are only three doctors for the entire hospital."*

Major Barriers

The most frequently reported barriers included:

- absence of GeneXpert (100%);
- weak referral and feedback systems (93%);
- recurrent stock-outs (81%);
- staff shortages and workload overload.

Table 1:
Summary of Themes, Subthemes, and Illustrative Quotes

Theme	Subtheme	Illustrative Quote
Knowledge	Correct understanding	"Actively searching for suspected TB cases."
	Partial understanding	"Everyone who coughs should be screened."
Attitudes	Low prioritization	"It is not considered a major priority."
	Demotivation	"Little pay, little work."
Practices	Non-systematic screening	"We mainly screen those who are coughing."
	Practical constraints	"Because of limited time and staff shortages."
Structural Conditions	Absence of GeneXpert	"The GeneXpert machine is 70 km away."
	Supply shortages	"Frequent shortages of reagents."
Barriers	Organizational	"No feedback system."
	Technical	"No access to GeneXpert."
	Human resources	"Insufficient staff."

DISCUSSION

This study reveals a significant gap between WHO recommendations for internal active TB screening and its implementation in the Koshibanda Health Zone. The

findings suggest that this gap is driven by interconnected systemic, organizational, and behavioral constraints.

The heterogeneous understanding of IAS reflects insufficient appropriation of guidelines rather than their absence. Misinterpretation of screening as symptom-based is largely attributable to limited continuous training and inadequate supervisory support, consistent with findings from other African contexts (Zulu et al., 2022).

Low prioritization of IAS reflects competing clinical demands and resource constraints, leading providers to deprioritize non-incentivized activities. This aligns with evidence on the challenges of integrating vertical programs into routine health systems (Der et al., 2022).

Symptom-based screening represents a pragmatic adaptation to structural limitations but reduces detection of asymptomatic or paucisymptomatic cases, particularly among people living with HIV (Divala et al., 2022; Brisset et al., 2013).

From a health systems perspective, constraints were observed across all WHO building blocks: human resources, diagnostics, supply chain, governance, and financing (WHO, 2024; Chauffour et al., 2024). These interacting weaknesses collectively undermine effective implementation of IAS.

The absence of GeneXpert highlights inequities in diagnostic access, while supply chain failures reflect systemic weaknesses in procurement and logistics (Majamanda et al., 2025; Williams et al., 2022; Ajudua et al., 2025). Organizational fragmentation and weak feedback systems further compromise continuity of care.

Overall, these findings demonstrate that improving IAS implementation requires a comprehensive health system strengthening approach rather than isolated interventions.

CONCLUSION

Persistent low implementation of internal active TB screening in the Koshibanda Health Zone is primarily driven by systemic and organizational constraints rather than insufficient provider knowledge.

The key barriers include workload pressure, supply shortages, lack of GeneXpert access, inadequate staffing, and weak referral systems. Addressing these constraints requires integrated health system strengthening, improved supervision, and enhanced provider motivation. A systemic and coordinated approach is essential to improve TB case detection and strengthen control efforts in similar resource-limited settings.

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