Implementing tuberculosis preventive therapy: a qualitative study

Dina Apriana[1]*, Sri Achadi Nugraheni[2], Antono Suryoputro[3]

[1]Master of Public Health, Diponegoro University, Semarang, Indonesia

[2]Department of Public Health Nutrition, Diponegoro University, Semarang, Indonesia

[3]Department of Health Administration and Policy, Diponegoro University, Semarang, Indonesia

*Correspondence:
dinaapri92@gmail.com

Abstract

Purpose: This study aims to analyze the implementation of tuberculosis preventive therapy (TPT) in Majalengka District using the Van Meter and Van Horn policy implementation model, focusing on inter-organizational communication, resources, implementer disposition, implementing agency characteristics, and economic-socio-political conditions. **Methods:** This qualitative study employed a case study approach involving six selected community health centers with the highest and lowest TPT coverage. Data were collected through in-depth interviews with six tuberculosis (TB) program managers, five triangulation informants, direct observations, and document reviews. Data were analyzed thematically, involving data reduction, presentation, and inductive conclusion drawing. **Results:** The study found that communication inconsistencies across national, provincial, and district levels led to information gaps at the community health center level. Implementation was hindered by limited human resources, diagnostic tools, and logistics, as well as the absence of clear internal regulations. However, proactive roles by TB program managers and cadres, supported by community-based outreach strategies, helped mitigate barriers. Social stigma, indirect costs, and low intersectoral coordination remained significant challenges. **Conclusion:** TPT implementation faced barriers such as inconsistent communication, limited resources, and unclear regulations. Effective TPT implementation requires coordination by the Ministry of Health, improved diagnostics by health facilities, empowerment of health workers and cadres, and strong support from local governments.

Keywords: policy implementation; tuberculosis elimination; tuberculosis preventive therapy

INTRODUCTION

Tuberculosis (TB) remains a public health problem in Indonesia, with more than 1 million new cases and around 134.000 deaths due to TB [1]. To combat TB, Indonesia targets elimination by 2030 through strategies outlined in Presidential Regulation No. 67 of 2021 on Tuberculosis Control, including tuberculosis preventive therapy (TPT) for those with latent TB infection, especially household contacts at risk of developing active TB [2]. Latent TB infection is a condition where a person is infected with Mycobacterium tuberculosis without symptoms and is not contagious, but still at risk of developing active TB, which can be prevented through TPT using specific drug regimens [3].

Although the effectiveness of TPT has been proven, its coverage in Indonesia remains far below the target of ≥80% [4-7]. According to data from the Indonesian Ministry of Health in 2023, the coverage of TPT for household contacts in Indonesia reached only 2.6% out of 13.4% of index cases [8]. In Majalengka District, a high TB burden area, TPT coverage also remains low at 15.5% out of 59.3% of index cases in 2024 [9]. This

indicates a gap between national policy and its implementation at the community healthcare level, particularly in community health centers.

Previous studies have shown that the success rate of TPT can be improved through patient-centered approaches, the use of short-course regimens, and the monitoring and management of side effects [10,11]. However, the implementation of TPT in various regions of Indonesia remains suboptimal due to inadequate performance of program implementers and management, limited availability of diagnostic tools, medications, and educational materials, as well as the absence of a clear service delivery pathway at the community healthcare level [12-14]. In addition, other barriers include low demand and acceptance from target populations, limited readiness of healthcare workers, difficulties in ruling out active TB before initiating TPT, and challenges in managing diagnostic tools and medication supplies [15].

Various previous studies indicate that although TPT coverage has been established as a key indicator for TB elimination, its implementation at the community healthcare level still faces numerous challenges. Most prior studies have not systematically analyzed the interplay of implementation factors using a policy-based framework, particularly in high TB-burden areas. The use of the Van Meter and Van Horn model, which incorporates six key variables: policy standards and objectives, resources, implementing agency characteristics, inter-organizational communication, economic-socio-political conditions, and implementer disposition, offers a structured lens to analyze policy execution.

This study aims to analyze the implementation of TPT in Majalengka District using the Van Meter and Van Horn policy implementation model. To date, no research in Indonesia has comprehensively applied this model in a high TB burden context. Most existing studies on TPT in Indonesia have primarily focused on medical or programmatic aspects, such as coverage, logistical challenges, or behavioral factors, without thoroughly examining TPT as part of national health policy or evaluating its systemic implementation at the local level. Therefore, this study seeks to fill that gap by providing a policy-oriented analysis of TPT implementation. The findings are expected to generate context-specific, evidence-based recommendations to strengthen TPT delivery in primary healthcare settings and support the achievement of the national TB elimination targets.

METHODS

This study employed a qualitative design using a case study approach to explore in depth the implementation of TPT in accelerating TB elimination efforts in Majalengka District. The study setting included 32 community health centers in Majalengka District. Subjects were selected using a purposive sampling technique, based on their roles and functions in TB program management. A total of six community health centers were selected: three with the highest and three with the lowest TPT coverage.

The research subjects consisted of primary and triangulation informants. The primary informants were TB program managers responsible for TPT implementation at the selected community health centers. The triangulation informants included five individuals: the Head of the Communicable Disease Prevention and Control (P2PM) Working Team at the District Health Office, the Head of a Community Health Center, the Head of the Penabulu Non-Governmental Organization (NGO), a TB health volunteer, and a household contact currently undergoing TPT.

Data collection was conducted from April to May 2025 in Majalengka District through in-depth interviews, direct observations, and document reviews. Interviews conducted offline at selected health centers (approximately 45–60 minutes) explored key themes from the Van Meter and Van Horn model. Observations assessed diagnostic tools, logistics, and infrastructure for TB services. Document reviews included policies, guidelines, reports, and coverage data to examine alignment between policy and practice and to complement primary data.

Data analysis was conducted using a thematic analysis approach, concurrently with the data collection process. The analysis involved three main stages: 1) data reduction, by filtering and selecting relevant information based on emerging themes; 2) data presentation, in the form of narrative descriptions; 3) conclusion drawing, conducted inductively and reviewed iteratively until data saturation was achieved. Data was organized and managed manually. Triangulation and member checking were conducted to ensure the trustworthiness of findings.

Data from observations were analyzed to identify patterns in resource availability and implementation gaps across sites, supporting and contextualizing interview findings.

Document reviews assessed alignment between policies and field practices by examining guidelines, reports, and supervision notes. All data sources, interviews, observations, and documents were thematically coded and triangulated, with member checking conducted to ensure credibility. This study received ethical clearance from the Health Research Ethics Committee of the Faculty of Public Health, Diponegoro University, Semarang, with approval number 128/EA/KEPK-FKM/2025.

RESULTS

The results of the study on TPT implementation are divided into several sub-variables, including inter-organizational communication, resources, implementer disposition, implementing agency characteristics, and economic-socio-political conditions. Table 1 shows the characteristics of key informants and triangulation informants involved in this study.

"There were times when the Ministry of Health held an online meeting on TB, followed by a separate meeting organized by the provincial level. This sometimes left us feeling confused."IT1

"There was also another meeting with different guidelines from the provincial level, stating that all contacts must first be screened, and if they show no symptoms, a TCM test is not necessary. However, pulmonary TB does not always present with symptoms. I often encounter patients who are close contacts of pulmonary TB cases but test positive on TCM."IU4

Observations confirmed communication gaps, with coordination meetings lacking stakeholder participation and incomplete follow-up on TPT. Information boards and internal memos were absent. Document review showed no updated guidelines or SOPs for TPT communication, with most documents still focused on DOTS and lacking district-level communication strategies

Table 1. Characteristics of key informants and triangulation informants in the study

No	Code	Age (years)	Educational background	Position/group	Years of service
1.	IU1	32	Diploma III in Midwifery	Midwife at Community Health Center	3
2.	IU2	39	Diploma III in Midwifery	Midwife at Community Health Center	15
3.	IU3	35	Diploma III in Nursing	Nurse at Community Health Center	3
4.	IU4	45	Bachelor and Professional Degree in Nursing	Nurse at Community Health Center	20
5.	IU5	30	Diploma III in Nursing	Nurse at Community Health Center	3
6.	IU6	43	Bachelor and Professional Degree in Nursing	Nurse at Community Health Center	14
7.	IT1	53	Bachelor Degree in Epidemiology	Head of the Communicable Disease Prevention and Control Working Team	3
8.	IT2	54	Bachelor Degree in Public Health	Head of Community Health Center	3
9.	IT3	29	Bachelor Degree in Islamic Education	Head of Penabulu NGO	1
10.	IT4	53	Senior High School	TB Community Health Cadre	9
11.	IT5	20	Senior High School	Household Contact	-

Inter-organizational communication

The delivery of information regarding TPT is still centralized at the TB program managers in community health centers, while the heads of community health centers have not been fully informed. At both the district and community health center levels, most information is obtained from the central and provincial governments through online platforms (Zoom), which often coincide with other program agendas and service activities. The consistency of information communicated across government levels (national, provincial, and district) has not been optimally maintained. This issue was revealed by several informants in relation to inter-organizational communication occurring in the field.

"Information from the District Health Office was mostly communicated to program managers rather than to the heads of community health centers."IT2

Resources

Human resources involved in the implementation of TPT primarily rely on the TB program managers at the community health centers. Other healthcare workers are often not involved due to heavy workloads and the lack of an official task distribution within the community health centers. In terms of facilities, the availability of TPT medications is currently sufficient, although it was minimal during the initial phase of implementation. However, supporting diagnostic tools, such as chest X-ray, tuberculin skin test, and molecular rapid tests, as well as appropriate service spaces, are still inadequate in many areas.

Funding for TPT at the community health centers level mainly comes from the Health Operational Assistance (BOK) and external partners such as the Global Fund. Still, it does not fully cover all necessary activities. At the district level, there is no specific allocation for TPT from the Regional Government

Budget (APBD), and the available funding is mostly used for administrative activities such as data validation meetings and evaluations. Both key informants and triangulation informants confirmed these limitations in resources.

> *"Actually, the TB program is quite broad despite its specificity. Moreover, TPT is relatively new, making it challenging for the government to keep up. The workload is very high while human resources are limited, as there are still many other tasks that need to be completed."IU3*

> *"The medication is not available and remains very limited. Therefore, we have to make choices based on the availability of drug stock."IU6*

> *"There are indeed activities funded by the BOK (Operational Health Assistance), but the number of cases exceeds the limits set by the BOK provisions."IU5*

> *"There are no specific activities for TPT. We have never held any events that specifically address TPT. However, during regular meetings, we continue to support program operations and discuss all matters related to TB."IT1*

Observations confirmed that TPT responsibilities were centered on TB program managers, with minimal support from other staff due to unclear task division. Many health centers lacked proper infrastructure and key diagnostic tools. Document reviews showed no specific budgets or guidelines for TPT, with most documents still focused on DOTS, reflecting limited institutional support at both facility and district levels.

Implementer disposition

Some TB program managers at the puskesmas already understand the standards and objectives of TPT. This is partly because not all implementers have educational backgrounds or professional roles in clinical service areas, such as nursing. Nevertheless, the attitude of most implementers is generally positive and proactive, as reflected in their willingness to serve, persuasive approaches, and initiative in conducting home visits and monitoring target groups. However, other healthcare workers still tend to display a passive attitude, often waiting for instructions to be involved.

Compliance with standard operating procedure (SOP) has not been entirely consistent, mainly due to limited supervision, lack of ongoing training, inadequate monitoring systems, and insufficient diagnostic tools. Despite these challenges, practical adherence is still maintained through home visits,

driven by the initiative of implementers and community health cadres. These findings on implementers' disposition are based on statements from several informants.

> *"In fact, we are the ones who take the initiative to learn, as I am still new to the role and also a midwife."IU2*

> *"They don't want to participate, even though I've invited them many times."IU4*

> *"Yes, I always come here and not to other places because I am directly connected with the program manager."IT4*

> *"I don't have the SOP yet. There has also been no socialization from the District Health Office."IU1*

> *"According to the regulations, TCM should not be used for asymptomatic patients. The challenge is that available diagnostic tools are still limited. Sometimes, we are considered to be violating the SOP by the provincial authorities."IT1*

Observations showed that while some TB managers were proactive, other health workers had minimal involvement in TPT due to unclear task distribution. Most centers lacked a specific SOP for TPT, and documents such as training materials or memos were also unavailable, indicating weak institutional support for consistent implementation.

Implementing agency characteristics

The absence of a formal organizational structure or a specific decree (SK) for a dedicated TPT team indicates weak institutional legitimacy. Responsibility for TPT implementation largely remains with the DOTS (Directly Observed Treatment, Short-course) service managers, without a clearly written division of tasks. Although TPT implementation follows national guidelines, it is not yet supported by internal regulations or specific technical instructions at the community health center level.

TPT implementation norms are often adapted to local conditions and carried out flexibly as a response to limitations in human resources and logistics (medications and diagnostic tools). Coordination and communication among implementers tend to be informal yet functional, demonstrated by active collaboration across implementers, including TB program managers and community health cadres. However, these relationships are not yet supported by a well-structured operational system. The characteristics of the implementing agency are

described through statements expressed by key informants and triangulation informants.

"During the recent accreditation, only the decree (SK) for the DOTS program was used."IU5

"Any decree (SK) that is issued still places the responsibility primarily on the program manager."IT1

"For the implementation of TPT, we adjust the standards. Due to logistical limitations such as the unavailability of Mantoux tests and TCM, we carry out the program flexibly as long as it continues to run."IT1

"I have a communication group with the community health volunteers (kader). After conducting home visits, they report directly to me, for example: "the close contacts are A, B, and C." Then I process the data and prepare the medication."IU4

Observations showed that TPT is managed without a dedicated team and remains part of the general TB workflow. No written guidelines or formal task divisions were found, with implementation relying on informal coordination. Document review confirmed the absence of specific SK or technical guidelines for TPT, and internal documents rarely mentioned it, indicating limited institutional support and operational clarity.

Economic, social, and political conditions

The implementation of TPT is not significantly hindered by direct costs, as services and medications are provided free of charge. However, indirect costs remain a challenge, particularly in accessing services in hard-to-reach areas. Despite this, outreach strategies such as home visits and medication delivery by community health cadres have been employed to overcome these barriers.

Social stigma within the community remains a significant obstacle. This condition often leads patients to conceal their treatment status, which negatively affects treatment adherence and the overall effectiveness of the program. Efforts to address this issue include interpersonal approaches, education, the use of non-stigmatizing terminology, and the active involvement of health cadres.

Political support from local governments is still limited, as reflected in the absence of specific regulations, policies, and budget allocations for TPT implementation. The program's execution continues to rely heavily on national policies and technical initiatives at the puskesmas level. The economic, social, and political conditions in Majalengka District regarding the implementation of TPT are based on information from key informants and triangulation informants.

"Sometimes the challenge lies in transportation. However, the solution is usually that the medication is delivered by the community health volunteer."IU5

"Most cases are actually not found through visits to the health center, but rather through reports from the community to the health volunteers (kader). Because people feel ashamed if others know they have TB, they tend to hide their condition."IT3

"From a policy perspective, there is currently no specific policy for that. This year, due to a change in the regent, we submitted a proposal, but were told it couldn't be specifically for TB. It had to cover infectious diseases in general."IT1

"It's the health volunteer who delivers the medication, so the patient and their family stay at home. We never go to the health center."IT5

Observations revealed that despite free TPT services, indirect barriers like transportation and remote access still limit service use. Health cadres help overcome this through home visits and medication delivery. Stigma remains a challenge, with patients preferring discreet treatment. Document review showed no specific budget or local regulations for TPT, highlighting reliance on national policies and weak local political support.

DISCUSSION

The findings of this study indicate that the success of TPT implementation largely depends on the strength of communication, institutional structure, and the availability of resources. Although national policies such as the TOSS TBC strategy have provided a foundation for structured communication, implementation at the local level often faces obstacles due to inconsistent information flow across levels of the health system. Informants emphasized that directives from the central, provincial, and district levels tend to bypass key stakeholders at the community health center level, resulting in implementation mismatches.

Strengthening structured, contextual, empathetic communication, and proven effective in community-

based approaches, can enhance understanding and community engagement [16]. Furthermore, the role of community health volunteers is crucial in bridging service gaps, particularly in areas with limited healthcare personnel. These findings suggest that increasing TPT coverage requires top-down policy clarity combined with bottom-up participatory mechanisms involving local actors and community perspectives.

Another important implication of this study is the need to address systemic limitations, particularly regarding human resources, diagnostic tools, and logistics. In line with previous studies, Rahayu and Alvi et al., this research confirms that shortages in human resources, limited diagnostic tools (such as tuberculin tests and chest X-rays), and disruptions in drug supply are major barriers [13,17]. The absence of specific operational guidelines and clear task delegation at the community health center level further exacerbates these challenges.

The study by Simarmata et al. reinforces the importance of structured task distribution and institutional support for program effectiveness [18]. On the other hand, several success stories from well-resourced community health centers demonstrate that proper investment in capacity building and logistics can enhance implementation outcomes [19]. Local sociocultural contexts, economic constraints, and TB-related stigma must also be integrated into program planning. Community-based education, stigma-reducing messages, and support such as transportation, incentives, and nutrition assistance can significantly improve treatment adherence and public acceptance of the program [20,21].

From a public health perspective, these findings highlight the importance of strengthening health system capacity at the primary care level to ensure the effective implementation of TB control strategies such as TPT. This includes the institutionalization of standard operating procedures, enhancement of cross-sectoral collaboration, and investment in health worker training and community empowerment. Moreover, integrating TPT into broader primary care and community-based health promotion efforts can improve program reach, equity, and sustainability, particularly in high TB-burden areas with limited resources.

Despite its valuable contribution, this study has several limitations. The qualitative approach with a relatively small number of informants does not capture the full diversity of implementation experiences. This study also did not conduct disaggregated analyses by gender, age, or socioeconomic status, which could provide a deeper understanding of implementation challenges across population groups. Furthermore, there were no quantitative measurements of program outcomes or performance indicators. Future research is recommended to adopt a mixed methods approach, involve more stakeholders, and evaluate the long-term impact of TPT implementation on TB incidence reduction and prevention.

CONCLUSION

This study shows that the implementation of TPT in Majalengka District is influenced by interrelated factors such as communication, resource availability, and institutional structure. Although national policies are established, challenges such as inconsistent information dissemination, limited diagnostic tools and logistics, and the absence of internal regulations remain obstacles in program execution. The active role of TB program managers and community health cadres has proven effective in bridging implementation gaps, particularly in hard-to-reach areas.

To improve implementation, the Ministry of Health should strengthen inter-level communication channels and provide standardized technical guidelines and training modules. District Health Offices need to formalize task distribution within community health centers, ensure availability of diagnostic tools (e.g., TST, chest X-ray, TCM), and allocate sufficient logistics. Local governments must increase budget allocations and issue local regulations (SK) supporting TPT implementation as part of infectious disease control.

Moreover, community health center leaders and program managers should adopt culturally sensitive, community-based outreach strategies to address stigma and indirect costs, including transportation or nutrition support for household contacts. Strengthening collaboration with non-health sectors (e.g., social affairs, education, village administrations) is also essential to expand reach and adherence. These targeted efforts can reinforce TPT implementation and accelerate TB elimination in high-burden settings.

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