

Evaluation of Tuberculosis program implementation in Primary Health Care, Semarang, Indonesia

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ABSTRACT

Background: Tuberculosis (TB) remains a significant global health concern, with approximately 10 million new cases reported annually and 1.5 million deaths each year.

Objectives: To accelerate Semarang's TB-free by 2028, this study aimed to evaluate the implementation of TB program in the primary healthcare centers (PHCs) of Semarang City.

Methods: The current study utilized a qualitative methodological approach and managed to gather and analyze data from staff who are in charge of the TB program. The findings indicated that the National TB System (SITB) and the Semar Betul system played crucial roles in the management and control of TB cases in Semarang City, each serving specific functions in recording and reporting TB data at the national and local levels.

Results: The study identified four emerging theme challenges faced by PHC staff as follows: (1) lack of national TB system, (2) unaffordable TB diagnostic tools, (3) need to address community-based beliefs and attitudes towards TB treatment and (4) treatment seeking behavior as part of comprehensive TB care strategies to improve treatment outcomes and prevent treatment defaulting among patients in community settings where illness perception may differ from that of healthcare providers.

Conclusion: These challenges will require a multifaceted approach, including strengthening the supply chain for TB diagnosis tools, increasing the availability of X-ray equipment, and providing continuous training for healthcare staff on TB screening and diagnosis.

Keywords: National TB system, Tuberculosis, TB management and control

1. Introduction

Tuberculosis remains a significant global health concern, with approximately 10 million new cases reported annually and 1.5 million deaths each year. Indonesia is ranked second in terms of TB burden, contributing 10% of the global total [1]. To address this issue, Indonesia has adopted the End TB strategy with the goal of TB elimination by 2030 [2]. Directly Observed Treatment, Short Course (DOTS) has been the official program for TB elimination in Indonesia since 1995, with primary healthcare centers serving as the initial level of service delivery implementation [3].

PHCs not only provide TB treatment but also conduct case finding and diagnosis [4]. However, several barriers to TB management and service quality exist at organizational levels, such as limited patient-centered approaches, inadequate resources and incentives, insufficient training, poor cross-sectional coordination, and strict performance assessment [5]. These barriers may result in healthcare system delays and prolonged diagnosis delays in patients. Previous study highlighted community unawareness and stigma as significant factors delaying patients' initial consultation in healthcare services [6]. Visiting multiple

healthcare services prolongs the delay in obtaining a proper TB diagnosis [7]. However, active case finding can be employed to prevent the longer delay in TB diagnosis and treatment [8]. In Semarang, the capital city of Central Java province, Indonesia, there are 37 PHCs, each with a specific DOTS room clinic supervised by one physician. The workload of each DOTS clinic varies based on the number of TB patients managed, with TB patient management not limited to DOTS clinics but also requiring collaboration with epidemiologists for index case evaluations in the community. The achievements in TB management and control programs differ among PHCs [9].

Despite 98.1% TB cases in 2022, Semarang's treatment success rate remains low at 84% compared to the national target of 90% [9]. This study evaluates TB program implementation in PHCs to identify strengths, weaknesses, and areas for improvement. Findings will inform evidence-based strategies to accelerate Semarang's TB-free status by 2028.

2. Methods

This study utilized a qualitative methodological approach to gather and

analyze data from TB program staff. The focus group discussions (FGDs) were carefully planned and executed to ensure comprehensive insights into the TB program's implementation and challenges.

2.1 Study Area

This study was conducted in Semarang, located on the northern coast of Central Java, Indonesia. It is Central Java province's capital city and the fifth-largest city in Indonesia. The city has approximately 1.5 million people, with 37 primary health centers. This study focused on the TB program staff operating at 37 primary health centers within the city.

2.2 Study Design

The study employed a qualitative methodological approach, utilizing FGDs as the primary data collection method.

2.3 Sample size and sampling

A total of 8-10 TB program staff members participated in each FGD session, resulting in a sample size of around 40 participants across all 37 PHCs. To be eligible for the study, participants needed to have at least 5 years of work experience in Semarang City's PHCs and a diploma in health education.

Individuals with less than a diploma were excluded from this study.

2.4 Data Collection

The discussions were structured around a guide developed based on the End TB strategy program guidelines, ensuring that key topics were covered consistently across all FGDs. Each FGD session lasted between 2-2.5 hours, allowing for in-depth exploration of participants' perspectives and experiences. The discussions were conducted in Bahasa Indonesia to facilitate open and candid communication among participants. Audio recordings of the FGDs were made with the participants' permission, enabling accurate transcription and analysis of the data. In addition to audio recordings, detailed notes were taken during the discussions to capture key points and observations.

Following each FGD session, the moderator and note taker debriefed to discuss the main themes and insights that emerged during the discussion. This post-discussion reflection allowed for additional notes to be taken, ensuring that all relevant information was captured. The verbatim transcription of the audio recordings was carried out by a research assistant to facilitate a thorough and detailed analysis of the data.

2.5 Data Analysis

Thematic analysis was employed as a method of data analysis, enabling the researchers to identify patterns and themes within the data [10]. The data management was used ATLAS-TI. To ensure the accuracy and validity of the findings, the data was cross-checked with the head of the TB program at Semarang City Health Office. This verification process helped to correct any inaccuracies, inconsistencies, or misinterpretations in the data analysis.

2.6 Ethical Clearance

The study adhered to ethical guidelines and received clearance from Universitas Negeri Semarang (UNNES) with the ethical clearance number 315/KEPK/EC/2023.

3. Results

This study identified four emerging themes of challenges faced by PHC TB program staff as follows:

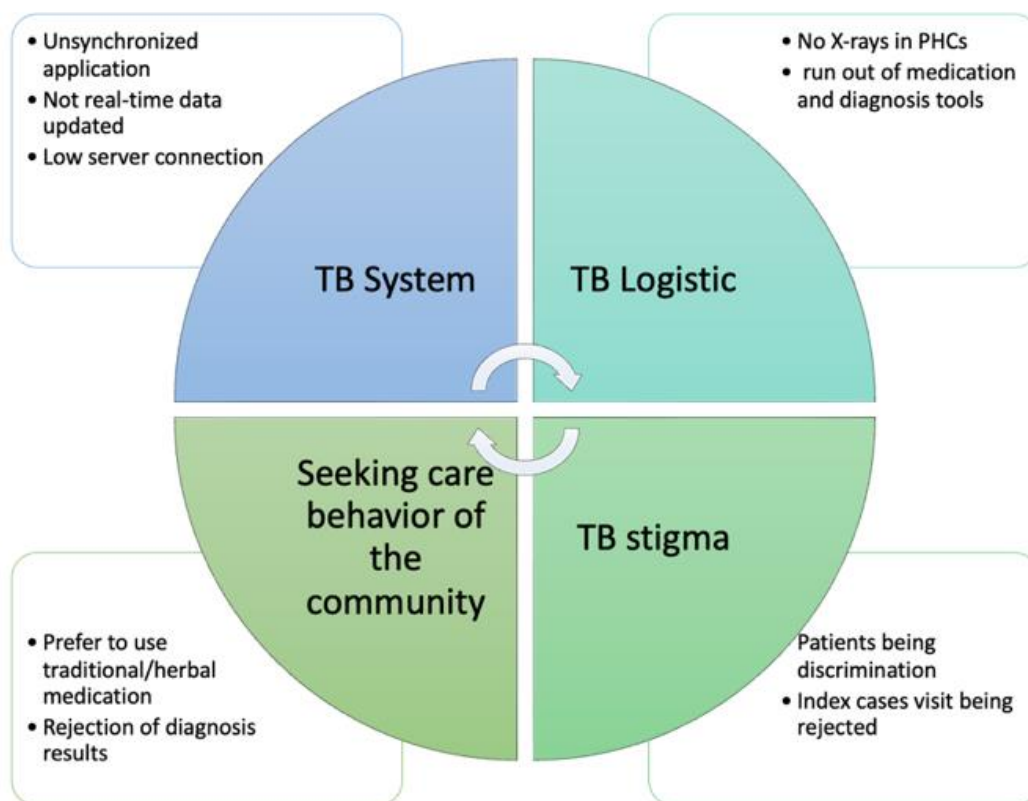


Figure 1: Challenges Identified by TB Program Staff

TB Systems

The National TB System (SITB) is a platform the Indonesian government implements to facilitate the recording and reporting of TB cases nationwide. It provides a standardized approach to TB management, including diagnosis, treatment, and follow-up care, and allows for real-time monitoring and analysis of TB data. The Semar Betul system, on the other hand, is a specific tool developed by the Semarang City Health Office to record and report visits made to index cases (i.e., family of the patients) by their close contacts. This system aims to prevent the spread of TB by identifying and treating potential secondary infections.

While both systems serve important functions, they operate independently, requiring TB staff to input data into both platforms separately. This duplication of effort can be time-consuming and prone to errors, as staff may forget to update one system or input incorrect information due to fatigue from entering data twice. Moreover, delays in updating data can result in delayed visits to index cases by healthcare workers, potentially allowing TB to progress and spread further within the community before treatment can be initiated.

"...sometimes the system also has problems with not being in sync. The SITB doesn't update what is reported that month and doesn't match the manual when the data is entered into the SITB, it still doesn't add up, so when you pull the data from the laboratory utilization report the data won't be the same. So, the SITB data is not relevant to the real-time..." (FGD4)

In addition to the asynchronous nature of SITB, the TB program staff also noted that it was frequently inaccessible during working hours, leading to delayed data updates. This was a common issue identified by the staff.

"...if we talk about systems, there are indeed many of us. The one that is used nationally is SITB and SITB can be accessed well outside of working hours. If during working hours we input just one patient, it can take up to half an hour. For the TB program the application is different, there are several applications, and they are not integrated, our hope is that they can all be integrated..." (FGD4)

TB logistic

Semarang City has set specific goals for finding TB cases at each PHC to align with national objectives. This requires proactive case detection in neighborhoods and

screening for at-risk populations by the health centers. However, staff have encountered difficulties in providing screening support, as Mantoux supplies may be depleted at times, causing delays in diagnosis. Consequently, patients may not follow up to receive their results, including for pediatric TB medication.

".... there are pediatric TB patients, but the medicine stock is empty. Usually treatment is postponed..." (FGD 2)

During the discussion, it was highlighted that the lack of X-ray facilities in primary healthcare centers (PHCs) is delaying the diagnosis of tuberculosis (TB). Patients have to travel to the hospital, which can be a barrier as some may choose not to go or take a long time to undergo X-rays. The staff also emphasized the need for skilled personnel to identify latent TB in the community. This was identified as a significant challenge in the discussion.

"... there are obstacles in screening, for example, if we suspect that the patient is headed that way and if we want to be examined or have TCM done, the patient feels that he is not sick and has difficulty expelling phlegm, whereas if we want to know whether TB is latent or not, that is a

problem in the test, that problem is related to the diagnostic approach..." (FGD 2)

Seeking care behavior of the community

The behavior of the community seeking medical care presents a significant obstacle to the TB elimination program. The staff of the TB program has highlighted that the use of traditional medicine is negatively impacting the number of TB patients completing their treatment. This is because, after two months of treatment, most patients experience a decrease in symptoms and feel healthier, leading them to opt for traditional herbal medicine to maintain their well-being and discontinue TB treatment from the (PHC).

"...the parents still feel that their child does not suffer from TB and only want to give him herbal medicine..." (FGD 4)

The TB program staff highlighted the notion of community-based illness as a contributing factor to treatment nonadherence in TB cases during focus group discussions. One specific instance was brought up where a patient consistently took their medication at the primary healthcare center but failed to continue treatment outside of the facility. This highlights the importance of addressing community-based beliefs and attitudes towards TB treatment as part of

comprehensive TB care strategies to improve treatment outcomes and prevent treatment defaulting among patients in community settings where illness perception may differ from that of healthcare providers.

"...last week, I had a patient who had been on treatment for 2-3 months; the treatment was carried out at the community health center, but when he was scheduled to take the medicine, he didn't take it, and the program holder asked me to take the medicine home. The patient said that he was taking the medicine, but it turned out that he had not taken it for several months..." (FGD 3)

TB stigma

The persisting stigma surrounding TB in the community poses a significant obstacle in efforts to eliminate the disease. Many TB patients prefer to conceal their infection from their community, making it challenging to identify index cases for investigation. Primary healthcare centers (PHCs) also face difficulties in conducting screening among family members due to the social stigma associated with TB infection. This reluctance to disclose TB status can hinder TB elimination efforts.

"...how can we find and invite people who, in fact, have TB who are quote-unquote

ostracized? There's a lot of stigmas; that's how we can embrace people so they're not afraid of TB, they're not ostracized. maybe it could be done with other education, or the cadres could be more advanced, so they don't become a scourge on society..." (FGD 3)

The social stigma surrounding TB not only affects individuals but also impacts the information provided by PHC staff to the community. Due to the stigma, PHC staff avoid directly addressing TB awareness, leading to a lack of access to TB services for individuals experiencing symptoms. This highlights the need to address the stigma associated with TB to improve awareness and access to healthcare.

"...the problem is also the stigma; if someone is sick, they feel like they are not sick or they are afraid of being found out because they think TB is a disease that is something like that. So, it's difficult to treat because patients don't want their neighbors to know about their disease, like one of the patients who sells and is found out if they have TB, finally gets busy and accuses us..." (FGD 2)

4. Discussion

The results indicated that the SITB and the Semar Betul system played crucial roles in the management and control of TB cases in

Semarang City, each serving specific functions in recording and reporting TB data at the national and local levels. While both systems were designed to improve TB surveillance and care, the findings highlighted several key issues that impact their effectiveness.

One of the main challenges identified was the lack of synchronization between the two systems, requiring TB staff to input data into both platforms separately. This duplication of effort not only consumed valuable time but also increased the risk of data entry errors, potentially compromising the accuracy and reliability of the information recorded. Discrepancies in data between the systems can lead to inaccuracies in reporting and hinder the real-time monitoring of TB cases. Similar issues have been reported in the use of electronic health records (EHR), including data entry errors and debugging systems [11, 12].

The findings underscored the need for greater integration and interoperability between the SITB and Semar Betul systems to streamline data collection, reporting, and monitoring processes, reducing the burden on TB staff, and enhancing the efficiency of TB control efforts. A unified and synchronized approach to TB data management could help optimize

resource utilization, minimize data inconsistencies, and improved the timeliness and accuracy of TB reporting and surveillance [13, 14]. Additionally, addressing issues related to system accessibility and functionality during working hours is essential to ensure continuous and reliable data updates for timely decision-making and intervention. This can employ an artificial intelligence approach for updating, connecting, and analyzing [15].

One major issue identified was the depletion of Mantoux supplies at times, leading to delay in diagnosis and subsequent follow-up by patients. This not only hinders the timely treatment of TB cases but also poses a risk of transmission within the community [16]. Furthermore, the unavailability of X-ray facilities in PHCs was identified as a significant barrier to the timely diagnosis of TB. Patients having to travel to hospitals for X-rays not only adds to the burden on patients but also increases the likelihood of delays in diagnosis and treatment initiation [17]. Additionally, the need for skilled personnel to identify latent TB in the community was emphasized as a crucial challenge in ensuring early detection and prevention of TB cases [18].

Addressing these challenges will require a multi-faceted approach, including strengthening the supply chain for TB diagnostic tools, increasing the availability of X-ray facilities, and providing continuous training for healthcare staff on TB screening and diagnosis. By addressing these issues, we can improve the early detection and treatment of TB cases in Semarang City, ultimately leading to better outcomes for patients and reducing the burden of TB in the community.

The discussion surrounding the community's behavior in seeking medical care for TB highlighted a significant challenge for TB elimination programs. The use of traditional medicine was negatively impacting treatment adherence [19], as patients often discontinued TB treatment from PHCs in favor of traditional herbal medicine after experiencing symptom relief during the treatment's initial stages. This trend was concerning because it led to treatment defaulting, which can result in drug resistance, relapse, or death. Previous study also highlighted that seeking traditional healers, including herbal or traditional medication, led to nonadherence to TB medication among patients [20].

The persisting stigma surrounding TB was a major obstacle in efforts to eliminate the

disease, as it hindered the identification of index cases and the conduct of screening among family members. This social stigma also affected individuals' willingness to seek TB services, leading to delayed diagnosis and treatment [21]. In FGDs conducted, participants highlighted the need to address the stigma associated with TB to improve awareness and access to healthcare. A multidisciplinary and multifaceted approach was necessary to tackle these complex barriers.

5. Conclusion

The study highlighted several challenges that hinder the implementation of TB elimination programs in Semarang City, Indonesia. These challenges included the asynchronous nature of the National TB System (SITB) and the Semar Betul system, leading to duplication of effort and potential delays in data updates and visits to index cases. The need for skilled personnel to identify latent TB also posed significant challenges. The behavior of the community seeking medical care and the persisting stigma surrounding TB infection also hindered TB elimination efforts. Addressing these challenges required comprehensive strategies that address community-based beliefs and attitudes, improved access to healthcare, and addressed

the social stigma associated with TB. Additionally, integrating systems like SITB and Semar Betul can help streamline data management and improve real-time monitoring and analysis of TB data. These strategies should be integrated into national objectives and aligned with specific goals set by Semarang City for finding TB cases at each PHC.

6. Study Limitations

The study focused on the challenges faced by PHC TB program staff, but it did not consider external factors that may influence TB management and control, such as the availability of resources and funding, the quality of diagnostic tools, or the healthcare system's overall capacity. Analyzing these external factors could provide a more comprehensive understanding of the barriers

to TB elimination in Semarang. While the study's findings provided valuable insights into the challenges faced by PHC TB program staff in Semarang, it was essential to note that the results may not be generalizable to other settings or countries due to differences in healthcare systems, resources, and cultural contexts. Further research should be conducted to validate these findings in other regions.

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