ENHANCING HEALTH SERVICES IN THE MANAGEMENT OF TUBERCULOSIS (TB) AT THE CLASS III YOUTH CORRECTIONAL INSTITUTION OF LANGKAT

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ABSTRACT

This study explores efforts to improve tuberculosis (TB) health services at the Class III Youth Correctional Institution in Langkat, Indonesia, using the Donabedian Model, which examines structure, process, and outcome aspects of healthcare delivery. The research highlights that TB remains a serious issue in correctional settings due to overcrowding, poor sanitation, and limited medical resources, requiring more systematic and integrated health service improvements. Using a qualitative approach, the findings reveal that the quality of TB services is still constrained by inadequate facilities, limited healthcare personnel, and inconsistent screening and documentation practices, which lead to delays in diagnosis and treatment. To address these challenges, the study proposes the SIPETIK (Integrated Clinical Tuberculosis Screening System) program, which focuses on improving digital medical records, implementing routine screening, strengthening health education, and enhancing collaboration with external health institutions. In conclusion, improving TB control in correctional facilities requires strengthening infrastructure, increasing staff competence, and integrating policies more effectively. The SIPETIK program offers a strategic and replicable model to enhance prison healthcare systems while supporting broader public health goals, particularly in the effort to eliminate tuberculosis.

Keywords: *Tuberculosis (TB); Prison Health; Donabedian Model; Healthcare Quality; SIPETIK Program*

INTRODUCTION

Health is recognized as a fundamental human right that must be guaranteed by the state to achieve social welfare. The 1945 Constitution of the Republic of Indonesia and Law No. 36 of 2009 on Health emphasize that every citizen has the right to obtain quality healthcare services without discrimination. In correctional institutions, this right applies equally to inmates, as affirmed in Law No. 22 of 2022 on Corrections. However, in practice, health services for inmates often face serious challenges, particularly regarding limited facilities, staff shortages, and overcrowding conditions that hinder the provision of optimal healthcare (Hutagalung & Parinduri, 2018).

Tuberculosis (TB) remains one of Indonesia's most pressing public health problems. The World Health Organization (WHO, 2023) ranks Indonesia as the second country with the highest TB burden globally, with an estimated 969,000 cases in 2021. The disease, caused by Mycobacterium tuberculosis, primarily attacks the lungs and spreads through airborne droplets. Delayed diagnosis and incomplete treatment often lead to continued transmission within the community and correctional facilities (Rokhmat et al., 2024). This situation highlights the urgent need for effective preventive and curative interventions within high-risk environments such as prisons.

Correctional institutions are among the environments with the highest risk of TB transmission due to overcrowding, poor ventilation, and limited healthcare access (Handayani & Adnan, 2019). Studies have shown that TB prevalence among inmates can be five to seventy times higher than in the general population. The lack of isolation rooms, inadequate medical supervision, and poor hygiene standards accelerate disease spread (Wijaya & Rahman, 2021). Therefore, TB control in correctional facilities requires integrated health service strategies aligned with public health principles and human rights obligations.

To assess and improve healthcare quality, this study employs Donabedian's (1988) model, which evaluates services through three interrelated dimensions: structure, process, and outcome. The "structure" refers to the availability of facilities and human resources; the "process" covers the implementation of care delivery; and the "outcome" represents the effectiveness of services in improving health conditions. Applying this model allows for a comprehensive evaluation of the correctional health system, identifying both internal constraints and potential strategies for improvement (Donabedian, 1988).

Previous research consistently emphasizes the challenges of prison healthcare. Zebua et al., (2024) found that the lack of medical infrastructure and staffing in Indonesian prisons hampers consistent service delivery. Simanjuntak and Iskandar (2023) reported that while TB healthcare policies exist, their implementation is constrained by limited coordination between correctional institutions and local health departments. Kurniawan et al. (2024) further identified overcrowding and poor ventilation as the main risk factors for TB in correctional environments. However, most studies stop at identifying problems rather than proposing structured, evidence-based solutions.

Few studies have explored strategies to improve prison healthcare through systematic models such as Donabedian's framework. There is also a lack of innovation in linking correctional facilities with external healthcare institutions to ensure continuous care. To address these gaps, this research proposes the SIPETIK Program (Integrated Clinical Tuberculosis Screening System)—a collaborative initiative with the Tanjung Pura Regional Hospital. The program emphasizes regular screening, early diagnosis, education, and follow-up monitoring based on a formal memorandum of understanding

(MoU) (Sembiring, 2025).

Based on the above discussion, this study raises two main research questions:

1. How can the quality of healthcare services for tuberculosis (TB) management be improved at the Class III Youth Correctional Institution in Langkat?
2. What structural and procedural factors influence the effectiveness of healthcare services in handling TB cases within the correctional institution?

This study aims to analyze the efforts to improve health services in managing tuberculosis at the Langkat Youth Correctional Institution through the lens of Donabedian's model. It seeks to evaluate the adequacy of healthcare structure, examine the effectiveness of service processes, and assess the outcomes of TB treatment among inmates. The research is expected to provide strategic recommendations for developing integrated prison health systems that protect inmates' rights while contributing to national TB control goals (Syahdila et al., 2024). Furthermore, it offers policy insights for the Ministry of Law and Human Rights to strengthen collaboration between correctional and public health sectors.

LITERATURE REVIEW

Health service delivery within correctional institutions has become a critical issue in both public health and human rights discourse, as it directly relates to the state's obligation to ensure equal access to healthcare for all individuals, including inmates. Zebua et al., (2024) found that prison healthcare systems in Indonesia still face significant structural barriers, such as limited medical facilities, shortages of qualified personnel, and insufficient collaboration with external health agencies. Similarly, Simanjuntak and Iskandar (2023) observed that the implementation of health service policies for inmates with tuberculosis (TB) remains ineffective due to poor inter-agency coordination and inadequate resources. These challenges are exacerbated by overcrowding, which increases the risk of infectious disease transmission within confined spaces (Kurniawan et al., 2024). Consequently, a systematic approach to evaluating and improving the quality of healthcare services in prisons is urgently required to enhance both inmate welfare and the effectiveness of disease prevention efforts.

Previous research suggests that Donabedian's (1988) model of healthcare quality is a relevant theoretical framework for assessing and improving health service delivery. The model evaluates quality through three key dimensions: structure, process, and outcome, enabling a holistic understanding of healthcare performance. Studies have applied this model to correctional settings and found persistent weaknesses in facility adequacy, staff competency, and adherence to medical service standards (Syahdila et al., 2024). Furthermore, the World Health Organization (2023) has reported that prisons in developing countries significantly contribute to national TB burdens due to limited screening programs, poor ventilation, and lack of continuous health education. Addressing these challenges requires innovative, evidence-based strategies such as integrated TB screening systems, inmate education programs, and inter-institutional cooperation for sustainable healthcare improvement (Rokhmat et al., 2024). Based on these studies, the present research seeks to fill the existing gap by applying Donabedian's model through the development of the SIPETIK Program (Integrated Clinical Tuberculosis Screening System) at the Class III Youth Correctional Institution of Langkat.

METHOD

This study employed a qualitative descriptive research design to explore and analyze the

improvement of health services in managing tuberculosis (TB) at the Class III Youth Correctional Institution of Langkat. The qualitative approach was chosen because it allows for an in-depth understanding of the complex social and institutional factors that influence healthcare delivery within correctional settings (Creswell & Poth, 2018). The descriptive design focuses on providing a comprehensive and factual depiction of the current healthcare system, particularly its structure, process, and outcomes, as conceptualized in Donabedian's quality of care framework (Donabedian, 1988). This design enabled the researcher to examine the roles of medical staff, correctional officers, and inmates in the provision of healthcare, as well as to identify challenges and opportunities for improvement.

The research was conducted at the Class III Youth Correctional Institution of Langkat, located in North Sumatra, Indonesia. The institution was selected as the study site because it has experienced a high incidence of TB among inmates, along with issues of overcrowding and limited medical facilities. The participants of this study consisted of key stakeholders directly involved in or affected by the prison's healthcare system. They included the Head of the Correctional Institution, the Head of the Guidance Subdivision, medical staff (doctors and nurses), and inmates diagnosed with TB. A purposive sampling technique was applied to ensure that the selected participants possessed relevant knowledge and experience related to healthcare services within the facility (Palinkas et al., 2015).

Data were collected using three primary qualitative methods: in-depth interviews, observation, and documentation review. In-depth interviews were conducted with each participant to obtain detailed insights into the quality and effectiveness of TB healthcare services. Observations were carried out within the clinic and residential areas to examine the environmental and procedural conditions affecting healthcare delivery. Meanwhile, documentation—including medical records, institutional reports, and health policy documents—was analyzed to triangulate and validate the data obtained from interviews and observations. All data were collected ethically, with the researcher obtaining informed consent from participants and ensuring confidentiality throughout the research process (Miles et al., 2014).

The collected data were analyzed using Miles and Huberman's interactive model of qualitative analysis, which includes three stages: data reduction, data display, and conclusion drawing or verification. Data reduction involved organizing and categorizing the raw data into meaningful themes related to the structural, procedural, and outcome dimensions of healthcare services. Data display was performed through tables, thematic matrices, and narrative descriptions to present patterns and relationships among findings. Finally, conclusions were drawn through iterative reflection and verification to ensure credibility and reliability. The analysis also incorporated a SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis to assess the feasibility of the proposed SIPETIK (Integrated Clinical Tuberculosis Screening System) program as a strategy for improving healthcare service delivery in the correctional environment (Sembiring, 2025).

RESULTS AND DISCUSSION

Based on the results of data collection and analysis, the implementation of self-reliance development programs at Class I Correctional Facility Medan demonstrates a complex dynamic, both in terms of success and the challenges encountered. These programs function as a strategic tool to support the rehabilitation of recidivist inmates—not only by providing practical and vocational training, but also by fostering moral, social, and

psychological development. This study reveals that the communication strategies employed by correctional officers have had a significant impact on improving the attitudes, behavior, and motivation of recidivist inmates to engage in productive activities.

Nevertheless, the full potential of these programs has not yet been realized due to various structural and individual-level barriers that hinder optimal participation. Therefore, this section will explore in greater depth how the communication model is applied, its influence on inmate engagement, and the specific obstacles faced in its implementation.

Structure, Process and Outcome of Health Services in TB Management

The results of this study revealed that the overall structure of healthcare services at the Class III Youth Correctional Institution of Langkat is still inadequate to meet the needs of TB management. Based on interviews with medical officers and administrative staff, the facility only has one general practitioner and three nurses who alternate shifts to handle nearly one thousand inmates. This condition is disproportionate to the facility's population and severely limits the availability of timely medical care. According to Donabedian (1988), the structural dimension, which includes human resources, facilities, and regulations, forms the foundation of healthcare quality. Therefore, deficiencies in this area have direct consequences for the effectiveness of service delivery.

In terms of infrastructure, the prison clinic lacks specialized diagnostic equipment for TB detection. The staff rely heavily on external laboratory services from the Tanjung Pura Regional Hospital for sputum testing and X-rays. As noted by the Ministry of Health (2023), effective TB control requires on-site diagnostic tools such as GeneXpert machines for early detection. The absence of these tools not only delays diagnosis but also increases the risk of disease transmission within the inmate population. This limitation reflects a critical gap in structural preparedness that hinders the prompt management of TB cases.

Observation data further revealed that the correctional clinic's spatial conditions are not ideal for infection control. The clinic's small examination room is shared by both TB and non-TB patients, increasing the possibility of cross-infection. Furthermore, ventilation and lighting in the clinic are poor, and isolation facilities for contagious patients are non-existent. This finding aligns with the research of Kurniawan et al. (2024), who identified poor ventilation and spatial congestion as major risk factors for TB spread in Indonesian prisons. Consequently, environmental health improvements are essential for ensuring structural readiness.

The prison also faces a shortage of medical supplies, particularly TB medication and personal protective equipment. According to the nurse respondents, the stock of first-line anti-tuberculosis drugs (Rifampicin, Isoniazid, Pyrazinamide, and Ethambutol) is often delayed due to bureaucratic procurement procedures. This situation forces healthcare staff to depend on emergency assistance from local health offices. Such inconsistency undermines the continuity of TB treatment, which requires strict adherence to multi-month regimens (World Health Organization [WHO], 2023). The lack of consistent medical supplies represents a structural vulnerability that directly affects treatment outcomes.

Despite these constraints, the commitment of prison management to providing basic healthcare remains visible. The head of the correctional institution has established cooperation with external medical providers, including Tanjung Pura Hospital and the local public health center (Puskesmas). This partnership facilitates the transfer of inmates for advanced care and supports referral systems for laboratory testing. While

these collaborative efforts are commendable, they are reactive rather than preventive, highlighting the need for an institutionalized and proactive healthcare framework.

The process dimension of Donabedian's model involves the activities and interactions between healthcare providers and recipients. The study found that the health service process in TB management at the Langkat Youth Prison is still irregular and lacks standard operating procedures. For instance, health screening is not routinely performed for new inmates, and medical check-ups are typically initiated only after visible symptoms emerge. This reactive approach is inconsistent with national TB control strategies emphasizing early detection and prevention (Simanjuntak & Iskandar, 2023). Consequently, many TB cases are detected late, leading to prolonged transmission cycles within the facility.

Interviews with TB-infected inmates revealed that the consultation process with medical staff is often brief, primarily due to high patient loads. Moreover, confidentiality during treatment is limited because counseling occurs in open areas where other inmates are present. According to Zebua et al., (2024), such a lack of privacy discourages inmates from reporting symptoms early, as they fear stigma from peers. This indicates that beyond medical competence, interpersonal aspects of service delivery significantly influence healthcare-seeking behavior in correctional environments.

The documentation process is another procedural weakness identified during field observations. Medical records are still maintained manually using logbooks, which are susceptible to data loss and duplication. The absence of digital health records limits the institution's ability to monitor treatment progress and analyze infection trends. Donabedian (1988) emphasized that proper documentation is essential for evaluating healthcare outcomes and identifying improvement areas. Thus, modernization of record-keeping systems is crucial for enhancing operational efficiency and continuity of care.

The outcome dimension reflects the results of the healthcare process in improving patient health and institutional well-being. The study found that TB recovery rates among inmates remain moderate, with treatment success hampered by irregular medication adherence and inadequate follow-up. While several inmates reported improvement after treatment, others experienced relapse due to inconsistent supervision. According to WHO (2023), adherence monitoring is critical in TB programs to prevent multidrug-resistant tuberculosis (MDR-TB), which poses even greater health risks in closed institutions.

Health education programs, which play an important role in supporting treatment success, are still minimal. Although occasional counseling sessions are held by prison nurses, they are not scheduled regularly, nor are they supported by educational materials. Handayani and Adnan (2019) emphasized that health literacy among inmates is a key determinant of disease prevention and treatment compliance. Therefore, improving the educational component of TB management could significantly enhance outcomes and reduce reinfection rates.

A SWOT analysis conducted as part of this study indicated that the correctional institution's main strengths include dedicated healthcare staff and external partnerships with hospitals. However, its weaknesses involve resource shortages, structural inadequacies, and lack of formalized procedures. The opportunities lie in potential collaborations with the Ministry of Health and non-governmental organizations, while threats include overcrowding and funding constraints. This analysis provides a strategic overview of factors influencing the sustainability of TB management in the institution.

In summary, the findings demonstrate that while there is institutional

commitment to addressing TB, systemic weaknesses in structure and process significantly limit the effectiveness of outcomes. Improvements in infrastructure, staffing, standard procedures, and monitoring systems are necessary to strengthen healthcare delivery. The integration of Donabedian's model into policy and practice would ensure a more balanced approach that combines structural readiness, procedural quality, and measurable health outcomes. These findings directly answer the first research question by identifying specific ways the quality of TB healthcare can be improved through systemic reform.

Strategic Improvement Through the SIPETIK Program

The second major finding of this study pertains to the identification of key factors influencing the effectiveness of TB healthcare services and the formulation of the SIPETIK (Integrated Clinical Tuberculosis Screening System) program as a strategic response. The SIPETIK initiative was developed based on empirical evidence gathered from interviews, observations, and documentation, highlighting the urgent need for integrated screening and monitoring mechanisms within the Langkat Youth Correctional Institution. The program aims to strengthen early detection, treatment adherence, and inter-institutional collaboration for TB management.

The first component of the SIPETIK program involves establishing routine health screening for all incoming inmates. Currently, screening occurs only after visible symptoms appear, which delays diagnosis and contributes to further transmission. Implementing systematic screening upon entry—using symptom checklists, chest X-rays, or sputum tests—would align with WHO's (2023) recommended TB control framework. This proactive step would enhance case finding, reduce infection spread, and provide baseline data for further monitoring.

The second component focuses on creating a digital health information system to document and track each inmate's TB status, treatment progress, and follow-up. As discovered in the findings, manual record-keeping leads to data fragmentation and inefficiency. The introduction of electronic health records (EHRs) would facilitate data accuracy, enable quick access to patient history, and support evidence-based decision-making (Miles et al., 2014). Furthermore, digitalization would make inter-agency communication between the prison and external healthcare partners more effective.

Another crucial element of SIPETIK is the referral and collaboration mechanism with the Tanjung Pura Regional Hospital. Formalizing this partnership through a memorandum of understanding (MoU) ensures structured communication and timely referrals for advanced diagnostics or hospitalization when necessary. According to Simanjuntak and Iskandar (2023), formalized collaboration is essential for overcoming bureaucratic barriers and sustaining continuity of care between prison and public health systems. The SIPETIK framework operationalizes this recommendation by embedding collaboration into routine institutional practice.

The fourth element of SIPETIK is health education and counseling for inmates, delivered through periodic sessions facilitated by healthcare professionals. Education focuses on TB transmission, medication adherence, hygiene practices, and stigma reduction. Research by Syahdila et al., (2024) indicates that inmates who receive regular health education exhibit higher compliance rates with TB treatment. By empowering inmates with knowledge, the program fosters self-care responsibility and peer support, which are vital for long-term disease control.

The fifth component introduces a monitoring and evaluation (M&E) system using Donabedian's structure-process-outcome framework. This system will periodically

assess whether healthcare inputs (structure), activities (process), and results (outcomes) align with established quality standards. The inclusion of quantifiable indicators—such as treatment success rates, screening coverage, and adherence levels—will allow administrators to identify weaknesses and implement targeted improvements. Such continuous evaluation fosters accountability and institutional learning (Donabedian, 1988).

The implementation of SIPETIK is expected to strengthen both the preventive and curative dimensions of TB control in the correctional environment. Preventively, routine screening and health education minimize infection risks, while curatively, structured treatment monitoring enhances recovery rates. Furthermore, the digital system ensures seamless data flow between the prison clinic and external hospitals, supporting a holistic approach to patient care (WHO, 2023). This integration embodies the principles of evidence-based health governance.

Stakeholders interviewed during this study expressed strong support for the SIPETIK program, particularly its potential to reduce administrative delays and improve coordination with external partners. The Head of the Correctional Institution emphasized that the program could serve as a pilot model for other facilities nationwide. Similarly, medical officers welcomed the idea of standardized digital reporting to streamline clinical documentation and medication inventory. Such institutional endorsement is crucial for ensuring program sustainability and scaling.

However, the program's success depends on several enabling factors, including government funding, staff training, and policy alignment. Financial resources are needed to procure diagnostic tools and establish the digital infrastructure. Moreover, capacity-building sessions must be conducted to train medical personnel and correctional staff on data management, TB protocols, and patient confidentiality. According to Palinkas et al. (2015), adequate capacity and resource allocation are essential determinants of effective program implementation.

One anticipated challenge is resistance to organizational change, particularly from staff accustomed to manual systems. To address this, SIPETIK's rollout includes a phased implementation plan—starting with pilot testing, feedback collection, and gradual scaling. Continuous stakeholder engagement and transparent communication can mitigate resistance and promote ownership. The participatory nature of this process aligns with Creswell and Poth's (2018) recommendation for inclusive implementation in institutional research.

The broader implication of SIPETIK extends beyond TB control; it demonstrates a replicable framework for improving healthcare governance within correctional systems. By institutionalizing structured screening, digital records, and inter-agency collaboration, the model contributes to systemic reform that enhances overall prison health quality. Such improvements not only fulfill human rights obligations but also protect public health by preventing the reintegration of untreated infectious cases into the community (Handayani & Adnan, 2019).

In conclusion, the findings under Discussion B answer the second research question by identifying the structural and procedural determinants of TB healthcare quality and by proposing the SIPETIK program as a viable solution. The integration of digital systems, routine screening, education, and inter-institutional collaboration addresses the core weaknesses identified in this study. If implemented effectively, SIPETIK could serve as a strategic model for national correctional health policy reform, bridging the gap between prison health management and broader public health objectives.

CONCLUSION AND SUGGESTION

This study set out to examine the quality of healthcare services in managing tuberculosis (TB) at the Class III Youth Correctional Institution of Langkat through the lens of Donabedian's (1988) model, which focuses on structure, process, and outcome. The findings reveal that while the institution demonstrates a commitment to providing healthcare, the system remains constrained by inadequate infrastructure, limited human resources, and weak procedural standards. These challenges have resulted in delayed diagnoses, inconsistent treatment adherence, and suboptimal health outcomes among inmates. The research confirms that structural and procedural reform is essential to enhance the quality of TB healthcare in correctional settings.

The study identified several structural weaknesses, including the lack of diagnostic equipment, insufficient medical personnel, and poor physical conditions within the clinic. The facility's dependence on external laboratories for sputum testing and X-rays significantly delays TB detection and increases the risk of transmission. Moreover, overcrowding—exceeding 200% of the designed capacity—creates an environment conducive to disease spread. These conditions demonstrate that without strong institutional infrastructure, TB management cannot be effectively sustained, regardless of staff dedication or external collaboration.

The process component of Donabedian's framework also revealed notable gaps. Health screenings are reactive rather than preventive, medical documentation remains manual, and treatment follow-up lacks consistency. These procedural shortcomings reduce the efficiency and reliability of service delivery. Inmates often receive limited counseling time, and the absence of privacy discourages early symptom disclosure. These findings align with previous studies by Simanjuntak and Iskandar (2023) and Zebua et al. (2024), which highlight systemic weaknesses in the operational aspects of prison healthcare services.

Regarding outcomes, the research found that TB recovery rates remain moderate, with recurrent infections occurring among previously treated inmates. The lack of consistent treatment adherence and poor health literacy among inmates contribute to these outcomes. Without structured education and follow-up, the risk of relapse and the potential development of multidrug-resistant tuberculosis (MDR-TB) remain significant threats. The study confirms WHO's (2023) assertion that sustainable TB control in closed environments requires integrated systems of diagnosis, treatment, and prevention.

Applying Donabedian's model provided a systematic understanding of the institution's healthcare performance. The model proved valuable for categorizing the observed problems and guiding strategic recommendations. By separating the analysis into structure, process, and outcome, the researcher was able to identify the interdependence between these components and how weaknesses in one dimension negatively affect others. Thus, Donabedian's framework serves not only as an evaluation tool but also as a basis for designing corrective interventions in correctional healthcare systems.

One of the most significant contributions of this study is the formulation of the SIPETIK (Integrated Clinical Tuberculosis Screening System) program as a practical solution to address existing deficiencies. The program integrates routine screening, digital health information systems, structured referral mechanisms, inmate health education, and continuous monitoring. These components align with national TB control guidelines and WHO standards for institutional health management. If implemented properly, SIPETIK can transform the current reactive system into a proactive, data-driven

model that ensures early detection and continuous treatment.

The implementation of SIPETIK carries broader policy implications beyond the Langkat Youth Correctional Institution. The program offers a replicable framework for improving health governance across Indonesia's correctional facilities. It encourages evidence-based decision-making, strengthens partnerships between correctional and public health authorities, and promotes digital transformation in healthcare delivery. This aligns with Indonesia's public health reform agenda, which emphasizes inclusivity and accessibility of services for all populations, including marginalized groups such as inmates.

Theoretically, this research contributes to the literature by contextualizing Donabedian's model within the Indonesian correctional system, an area that remains underexplored. It demonstrates how structural and procedural analyses can lead to actionable insights for health service improvement. Practically, it provides a foundation for future studies that wish to measure the effectiveness of intervention programs like SIPETIK or assess the long-term impacts of healthcare digitalization in prisons. Thus, this study bridges the gap between theoretical evaluation and applied public health strategy.

Based on the findings, several recommendations are proposed. First, correctional authorities should allocate sufficient funding to upgrade clinic infrastructure and procure essential diagnostic equipment such as GeneXpert machines. Second, a structured training program should be introduced for healthcare and custodial staff to enhance competence in TB management and digital record-keeping. Third, inter-agency collaboration must be institutionalized through formal agreements with hospitals and health departments. Finally, health education programs for inmates should be conducted regularly to improve awareness, reduce stigma, and promote treatment adherence. These actions would collectively strengthen the sustainability of TB control efforts within correctional environments.

Future research should focus on evaluating the implementation of SIPETIK across multiple correctional institutions to measure its scalability and effectiveness. Comparative studies could also assess variations in TB prevalence and healthcare quality between different prison classes or regions. Additionally, quantitative approaches may be used to complement qualitative findings by measuring treatment outcomes, adherence rates, and satisfaction levels. Ultimately, this study underscores that improving prison healthcare is not only a matter of institutional management but also a moral obligation of the state to uphold the right to health for all citizens, including those deprived of liberty. Strengthening healthcare systems in prisons is therefore essential for achieving national TB elimination goals and promoting public health equity.

REFERENCES

Aghion, B. A., & Morduch, J. (2005). *The economics of microfinance.* Cambridge, MA: MIT Press.

Creswell, J. W., & Poth, C. N. (2018). *Qualitative inquiry and research design: Choosing among five approaches* (4th ed.). Thousand Oaks, CA: SAGE Publications.

Donabedian, A. (1988). *The quality of care: How can it be assessed? Journal of the American Medical Association*, 260(12), 1743–1748.

Fauré, Y. A. (2002). *Micro-entrepreneurship and access to credit: A structural analysis. Small Business Economics Journal*, 18(3), 223–234.

Handayani, L. T., & Adnan, F. (2019). *Health services for inmates with tuberculosis in Indonesian prisons. Journal of Correctional Health Studies*, 5(2), 45–56.

Hutagalung, R., & Parinduri, S. (2018). *Public health service systems in Indonesia: Equity and policy implications. Jurnal Kebijakan Publik*, 12(1), 15–27.

Kurniawan, H., Handayani, L. T., Florensia, F., Wahyuni, I. S., & Astutik, R. T. (2024). *Prevalence and risk factors of pulmonary tuberculosis among prisoners in Jember Class IIA Correctional Facility. Professional Health Journal*, 5(2), 67–76.

Messah, B. O., & Wangai, P. N. (2011). *Microfinance institutions and small business performance in Kenya. Journal of Business and Social Science*, 2(9), 112–118.

Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). *Qualitative data analysis: A methods sourcebook* (3rd ed.). Thousand Oaks, CA: SAGE Publications.

Ministry of Health, Republic of Indonesia. (2023). *Annual Tuberculosis Report 2022.* Jakarta: Kementerian Kesehatan Republik Indonesia.

Palinkas, L. A., Horwitz, S. M., Green, C. A., Wisdom, J. P., Duan, N., & Hoagwood, K. (2015). *Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. Administration and Policy in Mental Health and Mental Health Services Research*, 42(5), 533–544.

Rokhmat, M., Fathoni, M., & Nurul, A. (2024). *Tuberculosis infection and prevention in public facilities: A health education approach. Journal of Epidemiology and Health Promotion*, 8(1), 11–20.

Sandra, W., & Rahman, A. M. (2021). *Public health challenges in correctional settings: A study of TB cases in Indonesian prisons. Journal of Prison Management and Health*, 3(2), 101–115.

Sembiring, C. Z. L. (2025). *Enhancing health services in the management of tuberculosis at the Class III Youth Correctional Institution of Langkat.* Tangerang: Politeknik Pengayoman Indonesia.

Simanjuntak, T. W. D., & Iskandar, I. S. (2023). *Implementation of health service policies for inmates with tuberculosis in Langkat Narcotics Prison. Journal of Civic Education*, 11(3), 221–235.

Syahdila, A., Equatora, M. A., & Tando, C. E. (2024). *Healthcare for prisoners with tuberculosis at Bogor Class IIA Correctional Institution. Indonesian Research Journal on Education*, 4(4), 123–138.

World Health Organization. (2023). *Global tuberculosis report 2023.* Geneva: World Health Organization.

Zebua, I. K., Daulay, H., & Madya, F. (2024). *Health services for inmates in correctional institutions. Public Policy Journal*, 15(1), 14–25.