

Analysis of the Implementation of the Tuberculosis (TBC) Elimination Program in Makassar City, Indonesia

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ABSTRACT

Purpose: This study analyzes the implementation of the Tuberculosis (TBC) Elimination Program in Makassar City using the policy implementation frameworks of Van Meter and Van Horn and George C. Edwards III.

Research Method: A qualitative design with domain analysis was employed. Data were collected through interviews, observations, and document reviews at the Makassar City Health Office and three community health centers.

Results and Discussion: The program has generally been implemented according to established policy standards. However, implementation remains constrained by limited human resources, weak cross-sectoral coordination, community stigma, and patients' economic constraints. Policy standards, communication, bureaucratic structure, implementer commitment, and infrastructure have supported implementation. Strengthening human resources, cross-sectoral collaboration, and community education is necessary to accelerate tuberculosis elimination.

Implications: The findings support policymakers in strengthening human resources, collaboration, and community-based TB control strategies.

Originality: This study integrates the policy implementation frameworks of Van Meter and Van Horn and George C. Edwards III to analyze the implementation of the Tuberculosis Elimination Program in Makassar City.

Keywords: policy implementation; TBC elimination; van meter; van horn; George C. Edwards III.

1. Introduction

Tuberculosis (TBC) remains one of the world's most significant public health challenges despite the availability of effective prevention and treatment strategies (Surtini *et al.*, 2025). Indonesia continues to rank among the countries with the highest tuberculosis burden globally, highlighting the need for comprehensive and sustainable control strategies. Effective tuberculosis control requires not only adequate medical interventions but also strong political commitment, effective governance, sufficient health financing, community participation, and well-coordinated public health policies. Consequently, tuberculosis should be viewed not merely as a medical problem but also as a public policy issue requiring collaborative and integrated implementation (Batara, 2026).

The same situation is evident in Makassar City, where tuberculosis cases have continued to increase in recent years despite the implementation of the national Tuberculosis Elimination Program (Fauzi & Ganiadi, 2025).



This trend indicates that the expected policy outcomes have not yet been fully achieved (Datau *et al.*, 2024). Various challenges, including limited human resources, insufficient community participation, weak cross-sectoral collaboration, and persistent social stigma toward tuberculosis patients, continue to hinder the effectiveness of program implementation (Togubu, 2025). Previous studies have identified several factors influencing the success of tuberculosis control programs, such as policy clarity, communication, resource availability, implementer commitment, and bureaucratic support (Nurafifah *et al.*, 2024).

However, most existing studies examine only selected dimensions of policy implementation, resulting in fragmented explanations of implementation performance (Putri, 2025). Furthermore, findings from other regions cannot be directly generalized to Makassar City because of differences in socio-economic conditions, health system capacity, and local governance (Pandiangan *et al.*, 2022). To address these gaps, this study adopts an integrated policy implementation perspective by combining the frameworks of Van Meter and Van Horn with George C. Edwards III (Batara & Andayanie, 2025).

These complementary frameworks enable a more comprehensive analysis of policy implementation by examining policy standards and targets, resources, communication, implementer characteristics, disposition, bureaucratic structure, and the social and economic environment affecting program implementation (Karno *et al.*, 2022). Accordingly, this study aims to analyze the implementation of the Tuberculosis Elimination Program in Makassar City and identify the key factors influencing its effectiveness. The findings are expected to contribute both theoretically to the literature on public policy implementation and practically to improving tuberculosis control policies at the regional level.

The remainder of this paper is organized as follows. Section 2 provides a literature review and hypothesis development. Section 3 presents the research method and design. Section 4 provides the results and discussion. Section 5 presents Concluding Remarks and Recommendations.

2. Literature Review and Hypothesis Development

Policy implementation is a critical stage in the public policy process because it determines whether policy objectives can be translated into effective outcomes. In the public health sector, successful implementation depends not only on policy formulation but also on the capacity of implementing organizations, the availability of resources, effective communication, and external environmental conditions (Posumah & Londa, 2023). Previous studies have shown that the implementation of tuberculosis (TB) control policies in Indonesia continues to face challenges related to human resources, intersectoral coordination, community participation, and social stigma, all of which affect program effectiveness (Datau *et al.*, 2024; Handoko *et al.*, 2024; Wahyuningsih *et al.*, 2025).

Among the most widely applied policy implementation frameworks are those proposed by Van Meter and Van Horn (1975) and George C. Edwards III (1980). Van Meter and Van Horn identify six variables that influence implementation success: policy standards and targets, resources, communication among implementing organizations, characteristics of implementing agencies, implementers' disposition, and the social, economic, and political environment. Meanwhile, Edwards III emphasizes four principal variables, namely communication, resources, disposition, and bureaucratic structure (Pandiangan *et al.*, 2022). Although developed from different perspectives, both frameworks

complement one another by explaining how organizational capacity and external contextual factors jointly influence policy implementation (Karno *et al.*, 2023).

Previous studies generally examined the implementation of tuberculosis policies using only one policy implementation framework or focused on a single determinant, such as human resources or communication (Putri, 2025; Simarmata, 2023; Sasmita *et al.*, 2024). Consequently, these studies provide only a partial understanding of the factors influencing policy implementation. Limited attention has been given to integrating the Van Meter and Van Horn framework with the Edwards III model to comprehensively explain the implementation of the Tuberculosis Elimination Program, particularly within the local government context of Makassar City.

Based on this gap, the present study integrates both policy implementation frameworks to analyze the implementation of the Tuberculosis Elimination Program in Makassar City (Togubu, 2025). The integration of these two models enables a more comprehensive assessment by examining policy standards, resources, communication, bureaucratic structure, implementers' characteristics and disposition, as well as social and economic conditions that influence policy implementation. This approach is expected to provide a broader understanding of the organizational and contextual factors affecting the success of tuberculosis elimination policies.

3. Research Method

This study employed a qualitative research design using a domain analysis approach to examine the implementation of the Tuberculosis (TBC) Elimination Program in Makassar City. A qualitative approach was considered appropriate because it enables an in-depth exploration of policy implementation processes, stakeholders' experiences, and contextual factors influencing program performance. The research was conducted at the Makassar City Health Office and three community health centers (Puskesmas), namely Kaluku Bodoa, Bara-Baraya, and Rappokalling. These sites were purposively selected because they actively implement the Tuberculosis Elimination Program and represent different service areas within Makassar City.

Data were collected through in-depth interviews, direct observations, and document reviews. In-depth interviews were conducted with key informants, supporting informants, and program implementers who were directly involved in planning, coordinating, and implementing tuberculosis control activities. Observations were undertaken to understand program implementation in the field, while document reviews were conducted to examine relevant regulations, program reports, and administrative records. Purposive sampling was used to select informants based on their knowledge, responsibilities, and direct involvement in the Tuberculosis Elimination Program. The study involved seven informants: one key informant from the Makassar City Health Office, three heads of community health centers, and three tuberculosis program officers.

Data analysis followed the domain analysis technique, which involved organizing interview transcripts, observation notes, and documentary evidence into meaningful categories based on the policy implementation dimensions proposed by Van Meter and Van Horn and George C. Edwards III. Data credibility was enhanced through source triangulation, method triangulation, and member checking to ensure the trustworthiness and consistency of the research findings.

Table 1. Informant Characteristics

Informant's Initials	Gender	Position	Type of Informant
SN	Female	PJ TBC P2P Makassar City Health Office	Key Informant
RT	Male	Head of Kaluku Bodoa Health Center	Supporting Informant
RA (1)	Female	Head of Bara-Baraya Community Health Center	Supporting Informant
YG	Female	Head of Rappokalling Community Health Center	Supporting Informant
MT	Female	TBC Officer at Kaluku Bodoa Health Center	Ordinary Informant
MA	Female	TBC Officer at Bara-Baraya Health Center	Ordinary Informant
RA (2)	Female	TBC Officer at Rappokalling Health Center	Ordinary Informant

4. Results and Discussion

4.1 Analysis Results

4.1.1 Policy Standards and Targets

The findings indicate that the implementation of the TBC Elimination Program in Makassar City complies with regulations, particularly Presidential Regulation No. 67 of 2021. Implementers at community health centers and the health office generally understand policy standards and targets. However, field outcomes have not fully met targets, especially in case detection and treatment sustainability.

"The program's targets are clear from the central government, but on the ground, there are still many obstacles to achieving all indicators, especially active case detection." (SN, March 2, 2026).

This indicates a gap between policy standards and on-the-ground implementation, influenced by various factors.

4.1.2 Resources (Manpower, Budget, and Infrastructure)

The study found that logistics, such as TBC medication, are relatively adequate. The recording and reporting system is also digital through the SITB (Integrated Tuberculosis Information System). However, limited human resources remain a major obstacle. The number of healthcare workers for TBC programs is insufficient to meet the workload.

"There is still a shortage of dedicated staff for the TBC program, so one person has to handle several programs simultaneously." (RT, March 4, 2026).

This demonstrates the need to optimize human resources to increase program effectiveness.

4.1.3 Characteristics of the Implementer

Implementers include health workers, cadres, and community groups. In general, they show good commitment and understanding. However, differences in capacity and roles, especially among cadres, affect program consistency in the field.

"The cadres are very helpful in the field, but their abilities and activeness vary." (RA (1), March 6, 2026).

This demonstrates the need to strengthen implementers' capacity evenly.



4.1.4 Communication

Communication between program implementers has been quite effective, particularly through routine coordination and the use of digital media. Program information is disseminated sequentially from the health office to community health centers. However, cross-sector communication remains suboptimal, resulting in suboptimal collaboration with non-healthcare stakeholders.

"Coordination between community health centers and government agencies is ongoing, but cross-sectoral coordination, such as with sub-districts or other parties, is still not optimal." (RT, March 4, 2026).

This research shows that strengthening cross-sectoral communication remains necessary.

4.1.5 Disposition

The disposition of implementers demonstrates a positive and supportive attitude toward the TBC elimination program. Implementers demonstrate a strong commitment to carrying out their duties, including patient support. However, limited incentives and a high workload pose challenges in maintaining consistent performance.

"We are continuing to implement this program because it is our responsibility, despite the existing limitations." (MA, March 4, 2026).

This demonstrates that support for implementers needs to be increased to ensure optimal performance.

4.1.6 Bureaucratic Structure

The program implementation structure has been functioning well, with clear reporting channels and the implementation of standard operating procedures (SOPs) for TBC services. However, several informants stated that the SOPs still need clarification and wider dissemination to avoid misunderstandings in the field.

"The SOP already exists, but several sections need to be clarified to avoid misunderstandings." (RA (2), March 6, 2026).

This demonstrates the need to strengthen administrative processes and standardize procedures.

4.1.7 Social, Economic, and Commitment

Social and economic environmental factors are among the main obstacles to program implementation. Public stigma against TBC remains high, impacting patient adherence to treatment. Furthermore, patients' economic circumstances also hinder treatment continuity.

"Many patients still feel embarrassed or afraid of having TBC discovered, so they sometimes don't take their medication regularly." (MA, March 4, 2026).

In terms of commitment, the government has demonstrated its support through existing regulations and programs. However, cross-sectoral engagement still needs to be strengthened to support the program's overall success.

The implementation of the TBC Elimination Program in Makassar City has been quite successful in terms of systems and policies. However, its implementation has been suboptimal due to limited human resources, inadequate cross-sectoral coordination, and the influence of social and economic factors, particularly the public stigma surrounding TBC.

4.2 Discussion

4.2.1 Policy Standards and Targets

The findings indicate that the implementation of the Tuberculosis (TB) Elimination Program in Makassar City has generally followed the policy standards established under Presidential Regulation No. 67 of 2021 and the national technical guidelines for tuberculosis control. Clear policy objectives have provided a common direction for healthcare providers in planning, implementing, and monitoring tuberculosis control activities. Nevertheless, several implementation targets have not yet been fully achieved, indicating that compliance with policy standards alone does not necessarily guarantee successful policy outcomes. This finding supports the policy implementation framework of Van Meter and Van Horn, which emphasizes that clear policy standards and targets are fundamental prerequisites for effective implementation. However, these standards must also be accompanied by adequate organizational capacity and sufficient resources to ensure that policy objectives can be translated into practical actions. Therefore, implementation success depends not only on the clarity of policy objectives but also on the ability of implementing organizations to operationalize them effectively.

The present findings are consistent with previous studies conducted by (Putri, 2025) and (Wahyuningsih *et al.*, 2025), which reported that clearly defined policy standards improve implementation consistency but do not automatically ensure policy effectiveness when organizational and contextual constraints persist. Accordingly, strengthening institutional capacity, improving coordination among implementing agencies, and continuously monitoring policy performance remain essential for accelerating tuberculosis elimination in Makassar City.

4.2.2 Resources (Manpower, Budget, Facilities, and Infrastructure)

The findings suggest that resource availability remains one of the most influential factors affecting the implementation of the Tuberculosis (TB) Elimination Program in Makassar City. Although medicines, diagnostic equipment, funding, and the Integrated Tuberculosis Information System (SITB) were generally available, the shortage of dedicated tuberculosis personnel substantially increased the workload of healthcare workers. Consequently, several essential activities, including active case finding, contact investigation, treatment monitoring, and community outreach, could not be implemented optimally. These findings support Edwards III's policy implementation model, which identifies resources as a fundamental determinant of successful policy implementation. Adequate resources encompass not only financial support and infrastructure but also sufficient human resources with the necessary competencies to implement policy effectively. Therefore, the availability of logistical support alone is insufficient if the number and capacity of healthcare personnel remain limited.

The present findings are consistent with (Datau *et al.*, 2024) who reported that shortages of healthcare personnel continue to hinder tuberculosis elimination efforts in Indonesia. Similarly, (Handoko *et al.*, 2024) found that insufficient staffing reduces service quality, limits program coverage, and constrains active case-finding activities. These findings indicate that strengthening both the

quantity and capacity of healthcare personnel should become a strategic priority for improving the effectiveness of the Tuberculosis Elimination Program in Makassar City.

4.2.3 Characteristics of the Implementer

The findings indicate that the characteristics of the implementing agencies have generally supported the implementation of the Tuberculosis (TB) Elimination Program in Makassar City. The Makassar City Health Office and community health centers have established organizational structures, clearly defined roles, and operational procedures that facilitate program implementation. These institutional arrangements have enabled healthcare personnel to coordinate tuberculosis prevention, case detection, treatment, and monitoring activities more effectively. According to Van Meter and Van Horn, the characteristics of implementing agencies, including organizational structure, competence, authority, and institutional commitment, significantly influence policy implementation. Organizations with clear responsibilities and effective coordination mechanisms are better able to translate policy objectives into consistent actions. However, organizational capacity should not be evaluated solely on formal structures but also on institutions' ability to adapt to operational challenges and changing public health needs.

The findings are consistent with (Handoko *et al.*, 2024), who reported that clearly defined organizational roles improve coordination and enhance the effectiveness of tuberculosis control programs. Similarly, (Putri, 2025) emphasized that institutional commitment and organizational capacity are essential for ensuring consistent implementation of tuberculosis policies at the local level. Therefore, strengthening institutional capacity through continuous training, effective coordination, and organizational learning remains necessary to sustain the implementation of the Tuberculosis Elimination Program in Makassar City.

4.2.4 Communication

Effective communication was found to play an important role in supporting the implementation of the Tuberculosis (TB) Elimination Program in Makassar City. Communication among the Makassar City Health Office, community health centers, healthcare workers, and other stakeholders has generally facilitated the dissemination of policy objectives and operational guidelines. Nevertheless, coordination with non-health sectors and community stakeholders remains limited, reducing the effectiveness of community outreach and active case-finding activities. These findings support Edwards III's policy implementation model, which identifies communication as one of the primary determinants of implementation success. Clear, consistent, and continuous communication minimizes misunderstandings among implementers and strengthens coordination across organizations. In contrast, ineffective communication may result in inconsistent implementation and reduced policy effectiveness.

The present findings are consistent with (Togubu, 2025), who emphasized the importance of interpersonal communication and community engagement in improving tuberculosis prevention and treatment adherence. They also support (Wahyuningsih *et al.*, 2025), who concluded that effective communication strengthens collaboration among stakeholders and enhances the implementation of tuberculosis control programs. Therefore, improving communication across sectors and expanding community engagement should become strategic priorities for accelerating tuberculosis elimination in Makassar City.

4.2.6 Disposition

The findings indicate that implementers maintain positive attitudes toward the Tuberculosis Elimination Program despite experiencing heavy workloads and limited incentives. Their professional commitment enables the program to continue functioning even under resource constraints. Edwards III emphasizes that positive implementer disposition significantly influences implementation effectiveness because committed implementers are more willing to overcome operational challenges. This finding supports (Purwati *et al.*, 2023), who argued that intrinsic motivation among healthcare workers contributes substantially to policy implementation success. However, maintaining such commitment requires institutional support through recognition, incentives, and professional development opportunities.

4.2.7 Bureaucratic Structure

The bureaucratic structure supporting tuberculosis control in Makassar City is generally well established. Standard operating procedures and reporting mechanisms have facilitated coordination among implementing agencies. Nevertheless, several respondents indicated that certain operational procedures remain insufficiently detailed, creating differences in interpretation across health centers (Syafuddin *et al.*, 2022). This finding aligns with Edwards III's assertion that bureaucratic structure should reduce uncertainty rather than create additional administrative complexity. Clear organizational procedures improve accountability and implementation consistency. Accordingly, periodic revision and dissemination of operational guidelines should be conducted to minimize implementation inconsistencies.

4.2.8 Social, Economic, and Commitment

The findings demonstrate that social stigma and economic hardship remain major barriers to tuberculosis elimination. Many patients hesitate to seek treatment because they fear discrimination, while limited financial resources often reduce treatment adherence. These findings strongly support Van Meter and Van Horn's proposition that external environmental conditions substantially influence policy implementation. Successful tuberculosis elimination therefore depends not only on healthcare services but also on supportive social environments and socioeconomic conditions. Previous studies by (Nurafifah *et al.*, 2024) and (Datau *et al.*, 2024) similarly concluded that psychosocial support, community participation, and multisectoral collaboration are essential for improving treatment adherence and reducing tuberculosis stigma. Accordingly, future tuberculosis policies should adopt a more integrated approach that combines medical interventions with health promotion, community empowerment, social protection, and cross-sectoral collaboration.

5. Concluding Remarks and Recommendation

This study examined the implementation of the Tuberculosis (TB) Elimination Program in Makassar City using the policy implementation frameworks of Van Meter and Van Horn and George C. Edwards III. The findings indicate that the program has generally been implemented in accordance with national policy standards and operational guidelines. However, its effectiveness remains constrained by limited human resources, weak cross-sectoral collaboration, persistent community stigma, and patients' economic constraints. Conversely, clear policy standards, effective communication within the health sector,

implementers' commitment, an established bureaucratic structure, and adequate infrastructure have contributed positively to program implementation.

Theoretically, this study enriches the literature on public policy implementation by demonstrating that the integration of the Van Meter and Van Horn framework with the Edwards III model provides a more comprehensive understanding of the organizational and contextual factors influencing the implementation of tuberculosis elimination policies. The findings suggest that successful policy implementation depends on the interaction of multiple implementation variables rather than a single determinant. Practically, the findings highlight the need for local governments to strengthen human resource capacity, enhance intersectoral collaboration, expand community participation, and implement continuous public education programs to reduce tuberculosis-related stigma. Strengthening collaboration among government agencies, healthcare providers, community organizations, and other stakeholders is essential for accelerating tuberculosis elimination in Makassar City.

This study has several limitations. It was conducted using a qualitative approach involving a limited number of informants from three community health centers in Makassar City; therefore, the findings cannot be generalized to other settings. In addition, the study focused on policy implementation from the perspective of implementers and did not comprehensively explore patients' experiences or the perspectives of other stakeholders. Future research should employ mixed-method or quantitative approaches involving broader geographical coverage and a larger number of participants. Further studies should also examine the effectiveness of digital health innovations, multisectoral collaboration, and community empowerment strategies in supporting the achievement of national tuberculosis elimination targets.

Statement of Use of Generative AI

During the preparation of this work, the author used generative artificial intelligence tools to support the scientific writing process. Grammarly was used to check grammar, refine writing style, and improve clarity in scientific writing. All interpretations, analyses, and conclusions presented in this study are the sole responsibility of the author.

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