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ANALYSIS OF PULMONARY TUBERCULOSIS CONTROL PROGRAM IMPLEMENTATION AT TANAH BARU COMMUNITY HEALTH CARE, DEPOK BARU

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ABSTRACT

Tuberculosis is an infectious disease caused by the bacterium Mycobacterium tuberculosis that remains a global problem. In response to the burden of TB, the Indonesian government has established the TB Elimination Target for 2030. Primary health centers play a crucial role in implementing TB elimination strategies in Indonesia through effective and sustainable essential health services. This qualitative study, using a rapid assessment test design, aims to explore the tuberculosis control program in the Community Health Center (Puskesmas) Tanah Baru area more deeply. Data were collected through observation techniques and in-depth interviews with selected informants. This study involved seven informants selected through purposive sampling based on their roles and relevance to the TB program, including the Head of the P2P Program at the City Health Office, the Head of the TB Program at the City Health Office, the Head of the Puskesmas, the Puskesmas TB Program Holder, a Puskesmas nurse, the Head of Kapitu, and positive TB patients. Data analysis was conducted using the concept of triangulation of sources and methods. The results showed that the input and process components in the Puskesmas Tanah Baru TB control program were optimal. The implementation of promotive programs in the form of counseling, preventive programs such as screening, contact investigation, and provision of TPT, as well as curative programs, has been carried out according to national standards. Regarding the output component, the coverage of health services for people suspected of TB and the successful treatment of TB cases have reached the target. However, the overall coverage of TB case treatment has not yet met the predetermined target. The results of the TB control program at Puskesmas Tanah Baru largely meet the established indicators, although community stigma remains a significant obstacle to TB control efforts. Promotive and educational programs in the Puskesmas Tanah Baru area should be strengthened to reduce stigma within the community.

Kata Kunci:
Program Penanggulangan;
Puskesmas;
Tuberkulosis.

ABSTRAK

Tuberkulosis merupakan penyakit menular yang disebabkan oleh bakteri Mycobacterium tuberculosis yang masih menjadi masalah global. Dalam menanggapi beban TB pemerintah Indonesia turut serta membentuk Target Eliminasi TBC tahun 2030. Puskesmas memainkan peran penting dalam menerapkan strategi eliminasi TB di Indonesia melalui pelayanan kesehatan dasar yang efektif dan berkesinambungan. Penelitian ini merupakan penelitian kualitatif dengan desain rapid assessment test yang bertujuan menggali lebih mendalam mengenai program penanggulangan Tuberkulosis di wilayah Puskesmas Tanah Baru. Pengumpulan data dilakukan melalui teknik observasi dan wawancara mendalam kepada informan yang telah dipilih. Penelitian ini melibatkan tujuh informan, yang dipilih secara purposive sampling berdasarkan peran dan relevansinya dengan program TB, antara lain Kepala Program P2P Dinas Kesehatan Kota, Kepala Program TB Dinas Kesehatan Kota, Kepala Puskesmas, Pemegang Program TB Puskesmas, Perawat Puskesmas, Ketua Kapitu, dan pasien positif TB. Analisis data dilakukan dengan menggunakan konsep triangulasi sumber dan metode. Hasil penelitian menunjukkan bahwa komponen input dan proses dalam program penanggulangan TB Puskesmas Tanah Baru sudah optimal. Pelaksanaan program promotif berupa penyuluhan, program preventif berupa skrining, investigasi kontak, dan pemberian TPT, serta kuratif telah berjalan sesuai dengan standar nasional. Hasil dari komponen output, cakupan pelayanan kesehatan orang terduga TB dan keberhasilan pengobatan kasus TB sudah mencapai target, namun cakupan pengobatan semua kasus TB belum mencapai target yang telah ditentukan. Hasil program TB di Puskesmas Tanah Baru hampir seluruhnya telah memenuhi indikator, stigma masyarakat masih menjadi hambatan signifikan dalam penanggulangan TB. Program promotif dan edukasi di wilayah Puskesmas Tanah Baru harus ditingkatkan lagi untuk mengurangi stigma di lingkungan masyarakat.

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INTRODUCTION

Tuberculosis (TB) is a contagious disease caused by the bacterium *Mycobacterium tuberculosis* (WHO, 2022). As an infectious disease, the estimated number of tuberculosis cases in 2021 was 10.6 million. This represents an increase from the 10.1 million cases recorded in 2020 (Bagcchi, 2023). In 2019, tuberculosis was responsible for 1.2 million deaths among individuals without HIV and an additional 208,000 deaths among those with HIV (Chakaya et al., 2021). The Southeast Asian region accounts for the largest proportion of tuberculosis cases (44%), followed by the African region (25%), the Western Pacific region (18%), the Eastern Mediterranean region (8.6%), the Region of the Americas (3.2%), and the European region (2.1%), which has the lowest contribution to the global TB burden (WHO, 2023). Indonesia is the second most affected country, accounting for 8.5% of the total cases among the eight countries responsible for two-thirds of global TB cases (Chakaya et al., 2021). In TB control programs, 'notification' refers to the official reporting of TB cases to the national health system. When someone is diagnosed with TB at a hospital, clinic, or health center, their case should be reported to the government. In Indonesia, it is estimated that there were 969,000 TB cases; however, only 724,309 cases (75%) were officially reported, meaning that 25% of cases were either not detected, not treated, or not reported to the health authorities. In 2022, the number of cases identified was the highest in the last decade (Kemenkes RI, 2023).

Noviyani (2021) explained that the prevalence of TB in Indonesia reached 759 per 100,000 population. The Java-Bali region ranked second in the number of cases after Sumatra (913 per 100,000 cases), with a prevalence of 593 per 100,000 population. In 2019, TB cases were concentrated in Sumatra and West Java, with the highest number recorded in West Java Province at 110,473 cases (Iskandar et al., 2023). Based on the health profile of Depok City, the total number of TB cases in Depok in 2022 was 6,549 cases (Dinkes Depok, 2023). In 2023, the total number of TB in Depok increased to 8,541 cases (Dinkes Depok, 2024). The TB mortality rate in Depok in 2023 reached 6.46 people per 100,000 population (Diskominfo, 2024). Additionally, the total number of TB cases in Tanah Baru Community Health Center (Puskesmas) reached 32 cases in 2023 (Dinkes Depok, 2024).

In response to the TB burden, WHO established the SDGs and End TB Strategy targets by 2030, aiming for a 90% reduction in TB deaths and an 80% reduction in TB incidence between 2015 and 2030 (Kemenkes RI, 2023). The Government of Indonesia also participated in achieving these targets by establishing its own TB Elimination Target for 2030. Indonesia aims to reduce the TB incidence rate to 65 per 100,000 population and the TB mortality rate to 6 per 100,000 population. Puskesmas, as primary health services, play a vital role in implementing TB elimination strategies in Indonesia. Preventive programs commonly implemented by the Health Office and Puskesmas include screening and contact investigation. Screening efforts, or active case finding in the community, can also involve tuberculosis activists or cadres (Kemenkes RI, 2020).

Research conducted at Puskesmas Gang Kelor, Puskesmas Purwoyoso, and Puskesmas in Sijunjung District revealed that TB control program implementation was still not fully optimal based on the evaluation of input, process, and output components. Shortcomings in the input component included double workloads due to inadequate human resources, limited training, and uneven allocation of BOK funds. In the process component, there were still weaknesses in health promotion programs that were not well-targeted, manual recording and reporting of cases, and a lack of preventive medicine. The shortcomings in the input and process components also affected the output component, resulting in case-finding and treatment success rates that had not yet reached the national targets (Deswinda et al., 2019; Sany Muftiah et al., 2021; Wilis et al., 2021). The input, process, and output components are interrelated, where input affects the quality of the process, which in turn affects outcomes. These three components can be helpful in evaluating policies and improving the programs implemented (Deng et al., 2022) Therefore, this study aims to describe the condition of the TB prevention and control program at Puskesmas Tanah Baru based on the input, process, and output components.

METHOD

Type of Research

This study employed a qualitative research design using the rapid assessment procedure (RAP) approach to gain an in-depth understanding of the tuberculosis (TB) control program at the Tanah Baru Community Health Center (Puskesmas). Rapid assessment procedures were used to gather and analyze information quickly, aiming to gain an initial understanding of a situation. The rapid assessment procedure was chosen because this study explores complex interventions, program evaluation, and understanding from a community perspective. However, while the RAP approach shortens the time for data collection in the field — from months or years to days or weeks — the qualitative analysis process at the core of RAP is not substantially shortened (Holdsworth et al., 2020). This approach is intended to produce comprehensive, in-depth, and relevant information within a relatively short timeframe without compromising integrity, while also encouraging active participation from relevant stakeholders (Beebe, 2001).

Place and Time of Research

The study was conducted in the working area of Tanah Baru Community Health Center and the Depok City Health Office during April–May 2024.

Research Informants

Details of the informants involved in this study are summarized in the following table.

Tabel 1 Details of the informants involved

No	Informants
1	The Head of the P2P Program at Depok City Health Office
2	The Head of the TB Program at Depok City Health Office
3	The Head of Puskesmas Tanah Baru
4	The TB Program Manager at Puskesmas Tanah Baru
5	A nurse at Puskesmas Tanah Baru
6	The Head of the Kampung Peduli Tuberculosis (Kapitu) Task Force of Tanah Baru Village
7	Patients with a positive TB diagnosis who received treatment at Puskesmas Tanah Baru

Informant selection was based on eligibility criteria for in-depth interviews, including: (i) willingness to participate as a research informant by signing an informed consent form, (ii) the ability to communicate effectively in Bahasa Indonesia, and (iii) direct involvement and experience in the TB program, whether as a policymaker, program implementer, or program beneficiary. Exclusion criteria included individuals who declined to participate in the study.

Data Collection

Data were collected through observation and in-depth interviews with selected informants. Informants were selected using a purposive sampling technique. The primary research instrument was the researcher, supported by an interview guide, note-taking tools, and an audio recorder. In-depth interviews were conducted in the local language (Bahasa Indonesia), lasting between 60 and 120 minutes, or until all themes had been thoroughly explored.

The interview guide was adapted from the components of the Monitoring and Evaluation Framework for TB Control Programs from WHO (2004) and categorized into three main themes: input, process, and output. Prior to its use in data collection, the guide was reviewed and validated by public health experts to ensure its alignment with the main research themes. Additionally, the researcher conducted interview simulations to assess the guide's validity. The guide consisted of open-ended questions, supplemented with probing questions to facilitate deeper exploration of information.

The themes explored in this study included input (human resources, infrastructure, funding, service flow standard operating procedures, and targets), process (program implementation, community

health worker empowerment, monitoring and evaluation, challenges and solutions, and partnerships), and output (achievement of program targets, community dissemination, implementation status, and future plans). Data collection involved both primary and secondary data. Primary data were obtained through in-depth interviews, while secondary data were sourced from the TB surveillance system at Tanah Baru Community Health Center and the Depok City Health Office.

Data Analysis and Processing

Data processing began with the transcription of recorded interviews, which were then reviewed and cross-checked against field notes taken during data collection. The analysis started by constructing a matrix based on emerging themes and sub-themes, which helped organize the information systematically. Each transcript was thoroughly read by the researcher to identify relevant keywords aligned with the established themes and sub-themes. These categories were reviewed and reassessed to ensure that responses reflecting similar content were accurately grouped. Initial findings were further verified by the research team to ensure consistency in categorization and accuracy in deriving representative statements for each theme and sub-theme. This process was followed by discussions among the researchers to reach consensus on the findings.

The validity of the research findings was ensured by referring to the Monitoring and Evaluation Framework for TB Control Programs from WHO (2004), which served as the basis for the study's themes and sub-themes. The study also employed source and method triangulation to enhance data validity. Source triangulation involved comparing data from various informants with diverse roles in the TB program, while method triangulation combined in-depth interviews and observational data. This triangulation was intended to assess the similarities and differences in findings based on themes and subthemes, which in turn become this study's findings. This approach aimed to provide a more comprehensive, in-depth, and trustworthy understanding of the phenomenon under investigation.

RESULT

The characteristics of the informants in this study are described in table 2.

Tabel 2 Characteristics of Research Informants

Informants Code	Sex	Age	Education Level
I1	Female	45	S1 Dentistry
I2	Female	55	S1 Nursing
I3	Female	34	D3 Nursing
I4	Female	54	S1 Medicine
I5	Female	46	D3 Nursing
I6	Female	56	SLTP
I7	Male	16	SMK

This research focuses on three themes, including the inputs, processes, and outputs of implementing the Tuberculosis Control Program at Puskesmas Tanah Baru, Depok.

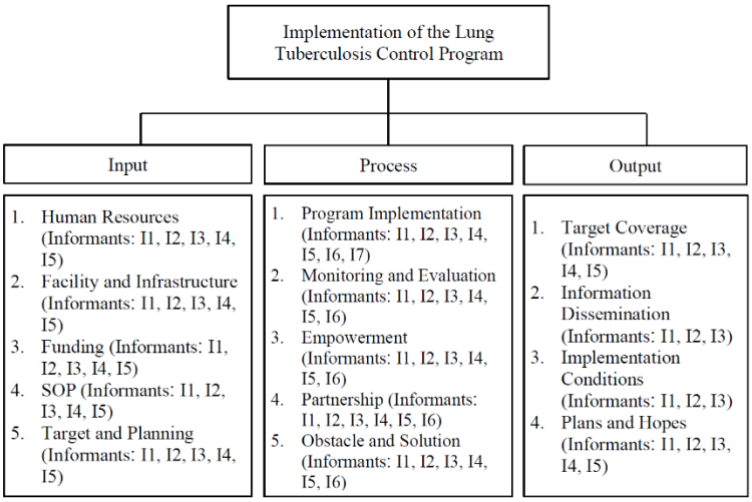

Figure 1. Themes and Sub-themes of the Tuberculosis Control Program Implementation

1. Input

Human Resources

Human resources at Puskesmas Tanah Baru already include a dedicated team for the TB control program, consisting of a program manager, doctors, medical laboratory technologists, environmental health officers, health promotion officers, and surveillance officers, each working according to their respective tasks and functions. The duties of the program holders at Puskesmas Tanah Baru have been focused on their specific programs. TB program officers have also received training from the Indonesian Ministry of Health and the Depok City Health Office. Although human resources at Puskesmas Tanah Baru are considered sufficient, there are still instances of double-tasking with other programs, as illustrated by the following interview excerpts from informants:

> *"There is one trained doctor specializing in TB, along with a nurse as the program coordinator, a laboratory technician (ATLM), an environmental health officer, a health promoter, and a surveillance officer, all of whom are involved in the program TB control. The doctor's role is to screen patients and provide education during consultations. The program coordinator is responsible for monitoring patients and coordinating with other sectors if necessary. The environmental health officer accompanies home visits to assess the living conditions and provide appropriate interventions for the household. The health promoter focuses on educating the community, including those with TB and those in close contact with TB patients… The doctor handles everything because they're on the front lines, but here, it is actually the nurse who takes charge of the program. You see, when the Health Office organizes trainings, it is usually the nurse who focuses on and manages the program.… The speakers can come from the Health Office or even the Ministry of Health, but we always base it on the invitation from the Health Office."- (I1, Head of Puskesmas)*

> *"I only handle the pulmonary TB program and the services at the clinic… As for training, the last one was back in 2018. Nowadays, training is available through webinars… It is good enough, The human resources are sufficient, and everyone is working according to their respective duties and responsibilities."- (I2, TB Program Manager at Puskesmas Tanah Baru)*

> *"The TB program is also managed by a nurse. If we're not at the TB clinic, we're at the nurse station, while the doctor in the clinic is also responsible for other programs.*

The lab staff also handles additional programs. All of us here have double jobs"- (I3, Nurse at Puskesmas)

"... There are efforts to improve the quality of human resources every year, whether through meetings, workshops, refreshers, or other types of gatherings..."- (I4, Head of P2P Program at Depok City Health Office)

Facility and Infrastructure

The availability of facilities and infrastructure at Puskesmas Tanah Baru for implementing the TB program is deemed adequate. These include TB-specific polyclinic rooms, basic laboratories, screening tools such as sputum pots and masks, drug storage facilities, and computers in each polyclinic room. However, the facility does not provide Rapid Molecular Testing (TCM) equipment, as TCM examinations are only available at sub-district-level Puskesmas according to regulations. The recording and reporting of TB cases are conducted through the online-based Tuberculosis Information System (SITB), which allows real-time access from anywhere. While the facilities and infrastructure are generally sufficient, occasional challenges still arise, particularly regarding the time required to input data into the system.

"We have a specialized TB clinic with medicine storage, a lab, and screening tools. However, we send samples to the Beji Puskesmas for TCM because we do not have the equipment yet. Typically, TCM facilities are available at sub-district Puskesmass. As TB program managers, we are provided with a laptop and a computer in the TB room."- (I3, Nurse at Puskesmas)

"Our infrastructure is sufficient... We're now using SITB for reporting, which works in real-time." - (I2, TB Program Manager at Puskesmas Tanah Baru)

"... SITB is a system where all data is recorded, meaning we can access it anytime, depending on the staff who input it. We hope that they do not delay the data entry."- (I4, Head of P2P Program at Depok City Health Office)

Funding

Funding for the TB control program at Puskesmas Tanah Baru is sourced from the Health Operational Assistance (BOK) fund. This fund is allocated for operational health service activities and Puskesmas management, including health worker visits for screenings and contact investigations, home visits, and health cadre activities. Meanwhile, the Depok City Health Office procures medical equipment and medicines using funds from the Regional Budget (APBD). According to several informants, the funds received by Puskesmas Tanah Baru are considered adequate.

"... Funding, such as for home visits and monitoring medication adherence, comes from the BOK budget... Items like masks, gloves, and especially sputum pots are usually provided by the health office. So far, thank God, everything has been fulfilled."- (I1, Head of Puskesmas)

"Regarding regulations and budgeting, the Depok City Government has also allocated funds sourced from the government budget or the city's APBD. These funds support TB program activities carried out by the Health Office, including activities related to SPM and those related to non-SPM. The budget is already in place."- (I4, Head of P2P Program at Depok City Health Office)

"All the necessary needs have been fulfilled."- (I2, TB Program Manager at Puskesmas Tanah Baru)

Standard Operating Procedure (SOP)

The Standard Operating Procedure (SOP) at Puskesmas Tanah Baru, which serves as a reference for tuberculosis case management, is based on Minister of Health Regulation No. 67 of 2016 on Tuberculosis Control and the Tuberculosis Control Guidelines issued by the Indonesian Ministry of Health. Tuberculosis case management begins with taking the patient's history and providing education on TB disease, including its prevention, transmission, and treatment. This is followed by recording patient information and examination results in medical records and the TB 03 and TB 01 registers, administering anti-tuberculosis drugs (OAT) to TB-positive patients, appointing Drug Swallowing Supervisors (PMOs), scheduling OAT collection, monitoring side effects, and planning home visits. By adhering to the SOP for TB management, health workers can deliver services in line with established standards, thereby improving the success rate of the TB program.

> *"For treatment, we have to do TCM first because we can not treat directly even with symptoms, TB suspected patients with TB complaints are given sputum pots, then if the results come out sensitive or positive for TB, then we treat them... The SOP reference is from the Ministry of Health."- (I3, Nurse at Puskesmas)*

> *"... Then, if there is a diagnosed TB case, a contact investigation is carried out. If a contact investigation has been conducted, it is determined whether they are suspected or if they are already a TB case. It is monitored until it can be properly managed,..." - (I4, Head of P2P Program at Depok City Health Office)*

> *"... Later, the sputum pot is checked. If the result is positive, continue to treatment. If it is negative, they are educated to get preventive therapy."- (I1, Head of Puskesmas)*

Target and Planning

The PHC-Level Planning (PTP) for the TB control program at Puskesmas Tanah Baru is conducted annually at the end of the year to plan Puskesmas activities for the forthcoming year. In planning future programs, the Puskesmas Tanah Baru has identified three key targets: increasing internal human resources, collaborating with cross-sectors, and reducing the number of TB patients. These targets are set by the PHC Performance Assessment (PKP) from the Depok City Health Office. Puskesmas Tanah Baru's targets encompass a range of indicators, including the coverage of health services for individuals suspected of having TB, the treatment of all TB cases, the success of TB treatments, and program objectives that refer to PKP.

> *"We usually make a PTP once a year for all programs... The short-term target is to reduce TB cases, and many people with TB are detected... The long-term target is to have no cases like the government program in 2030."- (I3, Nirse at Puskesmas)*

> *"... in terms of coverage, there is a target from PKP known as PHC Performance Assessment (PKP) related to TB... Increased cooperation with cross-sectors, especially with networks and cadres, as well as internal strengthening."- (I1, Head of Puskesmas)*

> *"... the target from the Depok City Health Office is 589 for suspected TB, then 79 for treatment of all cases for one year. Usually, we divide it monthly, with PKP, so the target is divided by 12 months."- (I2, TB Program Manager at Puskesmas Tanah Baru)*

> *"The Puskesmas is assigned a number each year by the Health Office in accordance with the directives of the West Java Provincial Health Office and the Ministry. Each Puskesmas work area or village has been assigned a number or target."- (I4, Head of P2P Program at Depok City Health Office)*

2. Process

Program Implementation

The TB program in the Puskesmas Tanah Baru area is implemented in accordance with Presidential Regulation No. 67 of 2021. It begins with implementing promotive, preventive, and curative programs, aiming for the TB elimination target in 2030.

> *"... referring to the national strategy, the elimination of tuberculosis that was established most recently, from Presidential Regulation No. 67 of 2021."- (I4, Head of P2P Program at Depok City Health Office)*

> *"... the promotive program ... socializing inside and outside the building through digital and direct communication strategies. In the case of patients with close contact with the source of infection, educational treatment and TPT (Tuberculosis Preventive Therapy) have been carried out, and the cadres always make visits to the patient's house so we can prevent the patient from TB transmission. The treatment involves a structured schedule, a designated treatment room, and direct communication via WhatsApp with the patient, especially the officer in charge of the program"- (I1, Head of Puskesmas)*

Promotive Education on Tuberculosis (TB) has been intensively conducted by Puskesmas Tanah Baru through various methods, including direct health education sessions and the utilization of social media platforms. Each morning, upon the opening of health center services, routine educational sessions on TB are delivered to visitors. Additionally, Puskesmas Tanah Baru actively disseminates educational materials through its Instagram account, particularly focusing on Tuberculosis Preventive Therapy (TPT) and the reduction of TB-related stigma. World Tuberculosis Day on March 24, is utilized to enhance educational efforts through activities such as webinars, live Instagram sessions, and informational posts on social media. One of the innovative educational approaches implemented is the "sharing session," in which a structured educational presentation is followed by an interactive question-and-answer session between participants and speakers, with TB as the main topic.

> *"We promote socialization at the Puskesmas. Additionally, the Puskesmas offers TB education at its opening time in the morning. We share TPT on Instagram and educate patients at the Puskesmas using speakers."- (I3, Nurse at Puskesmas)*

> *"It is like a sharing session. First the education, then questions, the listener can interact..."- (I1, Head of Puskesmas)*

> *"... the World Tuberculosis Day on March 24, they held many activities, including webinars, live Instagram, and social media posts, one of the activities for preventive-promotive..."- (I4, Head of P2P Program at Depok City Health Office)*

The implementation of contact investigation (CI) at Puskesmas Tanah Baru targets approximately 20 household and close contacts, including family members and neighbors of TB patients. To support this activity, the health center coordinates with the Kampung Peduli Tuberculosis Task Force (Satgas Kapitu), which plays a key role in conducting contact investigations and maintaining communication through WhatsApp groups. As community health cadres, Satgas Kapitu members, together with local neighborhood leaders (RT and RW heads), assist in addressing various field challenges, such as locating addresses and facilitating communication with TB patients.

The CI process begins after the health center provides TB case data to Satgas Kapitu. Satgas Kapitu then conducts home visits either independently or accompanied by the Puskesmas team. In addition to receiving case data from the health center, Satgas Kapitu also obtains supplementary data from Penabulu, a partner organization that collaborates with hospitals in Depok City to register TB cases. The data provided typically include detailed address information down to the RT and RW level, which facilitates the scheduling of home visits and the implementation of screening activities in each area.

"A home visit is conducted for each contact of the TB patient. In most cases, approximately 20 people, including neighbors on both sides, close contacts, and household contacts."- (I1, Head of Puskesmas)

"... a schedule for the visit will be established with the cadres through the Kapitu WhatsApp group."- (I2, TB Program Manager at Puskesmas Puskesmas Tanah Baru)

"... the challenges are not easy ... However, collaboration with cross-sectoral partners may facilitate information and assistance. In cases where addresses are unclear, individuals familiar with the route or location in the area (RT and RW heads) may be able to help..."- (I4, Head of P2P Program at Depok City Health Office)

"Every month, data is obtained from the Puskesmas both from Penabulu and the surrounding hospitals. If any index points are ill, for example, in this home. We will screen the area. The data is located there. The Penabulu have compiled data from hospitals throughout Depok. The data is now provided to us due to the collaboration between Puskesmas and hospitals. The data will be transmitted to us, and an RT-RW has been established. The next step is disseminating this information to the newly established Land Task Force group. My friends will report on their neighborhoods."- (I6, Head of Kapitu)

In addition to contact investigation, the detection of TB cases can also be achieved through screening. Screening is not limited to the general population; it is targeted at high-risk groups and is often conducted alongside the screening of other diseases, such as diabetes mellitus (DM), HIV, and non-communicable diseases (NCDs). Screening is performed through sputum examination for individuals newly classified into high-risk populations, such as those recently diagnosed with diabetes mellitus. Furthermore, community screening programs can be carried out in collaboration with the local health center and the Depok City Health Office, as demonstrated by the Satgas Kapitu of Tanah Baru.

"Additionally, screening is conducted for individuals at risk, including people with HIV, diabetes mellitus, and pregnant women."- (I2, TB Program Manager at Puskesmas Tanah Baru)

"... now TB can be from DM… If we find a person with DM, we will check their sputum... HIV can also be TB... Yesterday, we held a screening. We see that 14 RW have responded, which has the highest index? We are ready to collaborate with the Puskesmas."-(I6, Head of Kapitu)

"Kapitu Tanah Baru has also done TB screening in 2023. He invited us to an education event where he conducted the activity with the Puskesmas as a speaker, then they conducted TB screening..." (I1, Head of Puskesmas)

As a preventive measure, the Depok City Health Office has targeted the administration of Tuberculosis Preventive Therapy (TPT) to the general population since 2022, establishing three main target groups. TPT is provided to household contacts of TB patients, people living with HIV, and individuals with other risk factors. The goal of this TPT program is to prevent the development of active TB in individuals who have been exposed to TB bacteria but have not yet shown symptoms of the disease. If an individual's sputum test result is negative, TPT can be immediately administered as a preventive measure. However, the program faces challenges in the field, one of which is the persistent stigma surrounding TB in the community. Many individuals are reluctant or ashamed to undergo TPT due to concerns that they may be perceived as having active TB if it becomes known that they are participating in the program.

"... Starting in 2022, it began to be socialized related to the target for TPT; the program started to focus on three groups: households, people with HIV, and people with other risk factors."- (I5, Kepala Program TB Dinkes Kota Depok)

"Well, in the past, there was no prevention... Now, If he has a negative sputum test, he is immediately given prevention."- (I6, Head of Kapitu)

"Many people are still afraid to do TPT because of the stigma surrounding TB. People are also embarrassed if they find out they have TB."- (I2, TB Program Manager at Puskesmas Tanah Baru)

Puskesmas Tanah Baru provides TB services on Wednesdays and Fridays. Patients exhibiting symptoms suggestive of tuberculosis (TB) undergo TCM testing, while those diagnosed with TB undergo routine examinations and drug collection. In accordance with Depok City Puskesmas regulations, as outlined in Depok Mayor Regulation No. 49/2014, TB treatment is provided free of charge. Patients with tuberculosis (TB) at the Puskesmas Tanah Baru are required to visit the center every two weeks. During each visit, patients receive education regarding the importance of adhering to their medication regimen. DR-TB treatment is exclusively conducted at hospitals that fulfill referral services, namely UI Hospital and RSUD KISA. For patients with drug-resistant TB (DR-TB), the Puskesmas will initially procure the necessary medications from the hospital and subsequently administer treatment at the Puskesmas.

"So here, the TB service days are Wednesday and Friday ... the officer will monitor him; if he is new, TCM checks will be carried out. If he has had repeated treatment, it will also be seen how many months later, then the officer will check again the success of the treatment, ... The treatment involves a service schedule, a service room, and direct communication via WA to the patient, especially the officer in charge of the program. If the TB-RO drug is resistant, we take the drug from the hospital. Then the treatment will be here.".- (I1, Head of Puskesmas)

"The mayor's regulation 49 of 2014 exempts residents of Depok from fees for TB services at all Depok City Puskesmass. This makes it easier for people to access these services without worrying about costs… We have two referral services for drug-resistant TB. The first is UI Hospital, and the second is RSUD KISA in Sawangan…"- (I4, Head of P2P Program at Depok City Health Office)

"Every two weeks... For the first appointment, the important thing is to take medicine regularly; the explanation is like taking medicine regularly... at 9 pm, you can not miss it... during the new visit, there will be an explanation again, did you take medicine late or not? For example, if you do not take it, you have to start again from the beginning, like that. It is essential to take the medicine."- (I7, TB Patient)

Monitoring and Evaluation

Program monitoring activities are conducted by Puskesmas Tanah Baru once a month. The program report monitoring, which is carried out directly by the person in charge, and cross-sectoral monitoring are conducted every three months. According to the statements from informants at the Puskesmas and the Depok City Health Office, monitoring activities are carried out every three months. The monitoring process involves reviewing the Puskesmas Performance Assessment (PKP), reports submitted by health cadres, and the SITB dashboard. Meanwhile, evaluation is conducted through an online Zoom meeting platform, where challenges are discussed. The evaluation provides feedback to ensure that targets that have not been achieved can be maximized before the end of the year.

"We enter PKP data every month. If it is less, it will be evaluated to make it more efficient."- (I3, Nurse at Puskesmas)

"Monitoring and evaluation are done every three months because TB is in the essential program. Then quarterly with cross-sectors and the Kapitu task force, 3-4 times a year."- (I1, Head of Puskesmas)

"Monitoring and evaluation are usually based on the Puskesmas Performance Assessment (PKP) and the reports provided by the health cadres." - (I2, TB Program Manager at Puskesmas Tanah Baru)

"The evaluation is conducted via Zoom at a specific point, and from there, we assess the issues... why is this happening in this neighborhood?' 'Why is this happening in that neighborhood?'" (I6, Head of Kapitu)

"We conduct monitoring and evaluation; of course, we control the data from the SITB dashboard, we can pull the data per city district, and we give feedback on performance every three months... We also get feedback from the West Java Provincial Health Office every three months. This is our basis for conveying information to friends in the service...."- (I4, Head of P2P Program at Depok City Health Office)

Empowerment of Kapitu

The Kampung Peduli Tuberculosis (Kapitu) initiative represents a pioneering communication platform established by the Depok City Health Office at the urban village level. Its objective is to enhance the efficacy of tuberculosis control strategies. As of 2023, the Kapitu task force has been established in 63 urban villages. One such area is that of the Puskesmas Tanah Baru. The Kapitu initiative is responsible for conducting contact investigations, monitoring drug consumption (PMO), and providing educational services to families. The Puskesmas provides data on TB patients to the Kapitu, which then carries out its duties.

"The city of Depok already has a community collaboration called Kampung Peduli Tuberculosis (Kapitu). Each urban village head formed The Kapitu task force in 63 urban villages. We designed this Kapitu for a regional media or communication forum. We asked for the formation of a task force. This person helps people take drugs or PMO." (I4, Head of P2P Program at Depok City Health Office)

*"...It is called Satgas Kapitu.. This is Depok City's innovation. Kampung Peduli Tuberkulosis. Kapitu. The one in Tanah Baru is doing well. The officer works with the Kapitu team to conduct contact investigations, monitor medication, and educate families and surroundings.***"-** *(I1, Head of Puskesmas)*

"... from the data we received... all the patients here we distributed to Kapitu earlier. Later, they can be assisted by cadres from Kapitu."- (I2, TB Program Manager at Puskesmas Tanah Baru)

Kapitu funding utilizes Musrembang funds and is aided by PPTI and STPI Penabulu. However, this year, an update indicated that the Kapitu task force was merged into Community-Based Surveillance (SBM), broadening its scope beyond solely addressing TB.

"... the budget is in Depok City, we proposed it in Musrembang. The funding is from Musrembang and APBD funds. We also look for donors too... So I cooperate with PPTI and Penabulu-STPI. Penabulu provides snacks. PPTI provides lunch. So, from the APBD, it provides funds for activities; that's how we manage it. So the funds are indeed from the Puskesmas, from the village. The village is from the APBD. We also work with donors and community resources…" (I6, Head of Kapitu)

"This year and the next year, it is no longer specifically for Kapitu, ... special activities for Kapitu cadres this year have changed to SBM cadres, community-based surveillance cadres, so not only TB activities. So, at the time of the program, we also adjusted the budget and priorities of the city government. We work around it."- (I4, Head of P2P Program at Depok City Health Office)

Coordination

Cooperation between the Puskesmas and the Health Office is conducted by establishing a WhatsApp group, which serves as a platform for coordination and communication. Furthermore, Puskesmas's operational programs are inextricably linked to the assistance and objectives set out by the Health Office. Moreover, the Puskesmas engages in collaboration with a multitude of external entities, including the Penabulu Consortium-STPI (Stop TB Partnership Indonesia), Kampung Peduli Tuberculosis Task Force, PPTI (Perkumpulan Pemberantasan Tuberculosis Indonesia), and Kopi TB (Koalisi Organisasi Profesi Indonesia TB). Cross-sector coordination is conducted through the use of WhatsApp groups and the organization of social activities.

"For cooperation with the Health Office, there is a group for the person in charge of the program, the WhatsApp group. So they communicate there, continue to record, report through the group and then if there is anything, usually directly in the group... Intersectoral means with the Kapitu task force, the PPTI at the city level, then networking..."- (I1, Head of Puskesmas)

"We get our targets from the health office. All the tools are integrated. We usually report and submit anything we need to the health office."- (I2, TB Program Manager at Puskesmas Tanah Baru)

"*Penabulu has data from Depok hospital… because they cooperate with the hospital, they will send the data to us (Kapitu). I just need to share it in the Kapitu Tanah Baru task force group, and then these friends will report in the group…* "- *(I6, Head of Kapitu)*

"There is a WhatsApp group for the Puskesmas and hospital program managers. There is also a large group with the deputy supervisors as mentors. A pulmonary specialist is also in the group… as the head of the Kopi TB... You can ask them about clinical issues…"- (I4, Head of P2P Program at Depok City Health Office)

Obstacles and Solutions

The obstacles that often occur in the TB control program at Puskesmas Tanah Baru is the persistent stigma in society regarding TB, which causes many people to be embarrassed to get tested or ashamed if they are detected as TB-positive. In addition to these obstacles, there are also challenges, such as the lack of willingness among patients who have been confirmed with TB to carry out transmission prevention and regular treatment due to the side effects of the medication. The solution that can be implemented to address these obstacles is through education to the community via Puskesmass and local community health workers.

"Usually, during the implementation (screening), many have already been registered, but during the execution, the number does not match the specified amount."- (I1, Head of the Community Puskesmas)

"... many people are also embarrassed if they find out they tested positive for TB."- (I2, TB Program Manager at Puskesmas Tanah Baru)

"... some are usually afraid, some patients do not want to be visited because they fear the stigma from their neighbors." So, I already texted you on WhatsApp, ma'am, but I have not

gone to the house yet... it is already TB positive and not wearing a mask, it is easy to get infected and easy to spread to others... it is hard to make patients understand that they have to wear a mask... or the medication is not finished, not taken, already scheduled for a follow-up but still not coming, even when visited, there are still many excuses... We can not force them because they will not want to get treated if we force them. So, just educate them.- (I3, Nurse at Puskesmas)

"... and then he does not want anyone else to know." So he got angry, saying, "Do not let this person find out..." Meanwhile, he is wandering around selling without a mask... Many people with TB do not want to get treatment like that. When they do not get treatment, they feel healthy, but when they do get treatment, they actually get worse... yes, because as much as possible, it really involves frequent socialization… we also have to be patient when inviting the community..."- (I6, Head of Kapitu)

The next obstacle encountered is using the Tuberculosis Information System (SITB) application software. In addition, the SITB application also requires healthcare workers to input patient data directly when a case occurs. Still, it is known that it takes considerable time to input the data because, in SITB, the data must be sequential from A to Z. In other cases, the most frequently encountered obstacle is hardware issues that cause data input to be delayed, and sometimes, data does not even enter the application. In addressing the challenges of using SITB, monitoring and evaluation of the data obtained from Puskesmass are conducted, followed by feedback from the West Java Provincial Health Office.

"... but for the hardware, there might still be the same old problem with the input, so sometimes it does not get inputted either ..."- (I2, TB Program Manager at Puskesmas Tanah Baru)

"... we hope that they input it without delay..." but we also understand their challenges because inputting data takes time, you know, because in SITB it has to be in order from A to Z... "so the inputting of SITB according to the standards must meet the A to Z requirements, so it does take time, but we hope that we continue to encourage compliance among our colleagues, and conduct monitoring..."- (I4, Head of P2P Program at Depok City Health Office)

"... that's why the feedback is every 3 months so that they are aware, we also receive evaluations in return from the West Java Provincial Health Office..."- (I4, Head of P2P Program at Depok City Health Office)

3. Output

Target Coverage

The epidemiological condition of TB incidence in Depok City is known by looking at four indicators, namely the discovery of suspected TB cases at 109%, the discovery of suspected TB cases handled according to standards at 94%, the discovery of cases that have been treated at 130%, and the treatment success rate at 83% with a target of 90%.

"First, the discovery of suspected TB cases..." If we look at it, from 2020 to 2023, the trend has indeed been increasing... actually, the annual target should be 100%, but there were obstacles during the pandemic from 2020-to 2022, but fortunately, last year, it even exceeded 109% for suspected TB cases. The treatment success rate national target is 90%. In the year... 2023, it reached 83%. Although it is small, the trend is indeed declining."- (I4, Head of P2P Program at Depok City Health Office)

The Puskesmas nurse explained the epidemiological condition of TB at the Puskesmas Tanah Baru after reviewing the data summary in SITB. Based on the data, 475 suspected TB patients

(110.21%), 49 TB patients who started treatment (97.56%), and 41 patients (91.67%) have been treated successfully.

> *"TB in 2023 there were 8, ...treatment in 2023, there were 49 TB cases, so, there were no TB-HIV cases, ... the success rate is 41, the rest are not necessarily unsuccessful, because it continues into this year (2024)... the coverage of TPT administration is 23 people- (I3, Nurse at Puskesmas)*

Information Dissemination

Dissemination to the community is carried out directly and indirectly through certain platforms. One platform that is often used for this process is Instagram. Besides Instagram, a Health Promotion team assists in conveying information to the public. However, the implementation of more formal digital channels, such as the puskesmas website, has not been optimal. Indeed, institutional websites can function as formal channels for the communication of program achievements, the dissemination of tuberculosis education, and the promotion of community-based data transparency.

> *"The website exists, but because the Puskesmas does not have a dedicated staff member to manage it regularly, it often does not get updated." If Instagram is more up-to-date.- (I1, Head of the Community Puskesmas)*

> *"Usually, we like to share on Instagram..." "We also have a promkes (health promotion) team that can help convey it to the public" - (I2, TB Program Manager at Puskesmas Tanah Baru)*

Implementation Conditions

The TB program targets have not yet reached 100%. This is seen from the fact that treatment success remains at 83%, still have not reached the specified target of 90%, and there are still TB cases that have not been confirmed by the community Puskesmas or cadres. Puskesmas Tanah Baru stated that although there are still areas that have not been maximized, all the programs carried out by Puskesmas are already in accordance with the 2023 targets that have been set.

> *"... the success of the treatment because, for example, out of 36 patients, in 2023 it turns out they have only been treated for 3 months, so it means they have not successfully completed the treatment yet..." The completion might be in 2024... because we, the community Puskesmas, have a target number of people affected by TB, while the detected TB cases are not that many yet...- (I1, Head of Puskesmas Tanah Baru)*

> *"... there is one that was not achieved, lacking 2% ..." - (I2, TB Program Manager at Puskesmas Tanah Baru)*

Plans and Hopes

The Puskesmas hopes that in the future, all TB programs that were not achieved in 2023 will be accomplished in 2024. Although it is considered not yet optimal in achieving the target, it is known that there has been no revision/update of the program for the time being. The Puskesmas hopes to increase screenings for household contacts and the general public.

> *"The target for the TB program, the suspected TB cases, can be achieved, and those who have not completed their treatment can finish it..."- (I1, Head of Puskesmas Tanah Baru)*

> *"The target for 2024 has not been revised for now, and there might be a plan for an update with the creation of TB Warriors for children in schools."- (I2, TB Program Manager at Puskesmas Tanah Baru)*

"... there is not really (any revision/update), maybe just increase the screenings, because in the end, it always comes down to screening for TB..." increase screening for close contacts and the general public, it could be at community health posts or during events.- (I3, Nurse at Puskesmas)

From the Health Office of Depok City, there is hope that the implemented programs will help increase the number of suspected TB case detections, which can help improve the success rate of treatment.3

"... Hopefully, the expectation is that it will increase again (the discovery of suspected TB cases) until the end of the year..." Until this April, it was only 26.3. But this is still ongoing. The hope is that in 2024, the success rate of treatment will increase again. (I4, Head of P2P Program at Depok City Health Office).

DISCUSSION

The input aspects of the TB control program at Puskesmas Tanah Baru, particularly the healthcare personnel, funding, and facilities, are considered quite adequate. Puskesmas Tanah Baru has a special TB program team that assists in the detection and handling of cases, where doctors and program holders have received training from the Health Office and the Ministry of Health of the Republic of Indonesia to improve the quality of healthcare workers in terms of knowledge, attitude, and skills. Providing training to healthcare workers significantly increases the detection of TB cases (Amare et al., 2023). In addition to human resources, the availability of sufficient funds will support the TB control program in running effectively and efficiently (Faradis & Indarjo, 2018). Funding at the Puskesmas Tanah Baru comes from the BOK fund, which is utilized for healthcare service operations, including case screening by visiting patients, household contacts, and close contacts. The APBD funds managed by the Depok City Health Office also assist the Puskesmas community in procuring medical equipment and medications.

The facilities and infrastructure available at the Puskesmas Tanah Baru are already capable of supporting the implementation of the TB control program. Although a simple laboratory is available, the Puskesmas Tanah Baru does not yet have a TCM examination tool as the main diagnostic tool for establishing a TB diagnosis. Without TCM, the diagnosis of tuberculosis (TB) can be slower, especially in detecting drug resistance. The presence of TCM examination tools is one of the efforts to facilitate access to TB services to expedite diagnosis so that patients can receive treatment as early as possible, which is one of the national strategies for TB elimination (Chandra & Syakurah, 2022; Presidential Regulation of the Republic of Indonesia Number 67 of 2021 on Tuberculosis Control, 2021). Following the guidelines of Permenkes No. 67 of 2016, the recording and reporting of TB cases at the Puskesmas Tanah Baru have utilized a web-based Tuberculosis Information System (SITB) application, a tool integrated with the Ministry of Health that streamlines data input and dissemination. This aligns with Nababan et al. (2022), who highlighted SITB's role in enhancing TB data management, however, their study also reported delays in monthly Puskesmas Matiti reporting due to health workers being responsible for multiple programs. Puskesmas Tanah Baru faced different challenges, particularly hardware-related issues that caused delays in data entry and occasional data loss. These technical problems have been addressed through the routine monitoring and evaluation process.

Implementing the TB program in the Puskesmas Tanah Baru area has been in accordance with Presidential Regulation Number 67 of 2021, starting from implementing promotive, preventive, and curative programs to cross-sectoral efforts to achieve the tuberculosis elimination target by 2030. The results of this study indicate that TB preventive activities in the Puskesmas Tanah Baru area have identified active cases, starting with screening, contact investigation, and preventive therapy. The detection of active cases aims to identify TB patients among those who have symptoms, including active TB patients who do not access healthcare services. The hope is that with the increase in TB case detection, the transmission rate will decrease, and the initiation of TB treatment will be accelerated (Burke et al., 2021). The success rate of case detection is closely linked to the role of cross-sector collaboration (Kapitu task force) that bridges the Puskesmas and the community. In line with the research by Zulu et al. (2022), the implementation of screening conducted alongside community activities such as Posbindu and involving cadres from the community environment has resulted in higher

community acceptance of TB screening. Furthermore, the Puskesmas Tanah Baru area has provided TPT to cases identified from close contacts with negative results. However, TPT can not entirely prevent TB, so Puskesmas Tanah Baru continues educating patients when administering TPT (Harries et al., 2020).

Despite the presence of adequate inputs in the form of health workers, funding, facilities, and infrastructure at Puskesmas Tanah Baru, and the implementation of the TB control process that aligns with national guidelines, not all program outcomes achieve optimal results. This suggests that the success of the TB program is not solely determined by the quality of inputs and implementation of processes, but also by various external factors that affect outputs, such as patient compliance, social support, and stigma in the community. Therefore, it is necessary to evaluate the gaps between the process and the final results of the program, including in the aspect of TB treatment.

Barriers to TB treatment are caused by several factors, including low socioeconomic status, stigma of job loss risk, and drug side effects. This results in TB patients delaying and discontinuing their treatment (Chen et al., 2021; The Lancet Regional Health – Southeast Asia, 2024). Therefore, in order to address the economic impact, TB treatment in Depok City has been exempted from service fees through regional regulation number 49 of 2014 and has also provided social assistance to underprivileged TB patients in the Puskesmas Tanah Baru area. In addition, Puskesmas Tanah Baru always strives to enhance promotional activities, both through Instagram and by directly educating the community, to address stigma and the side effects of medication in society. Continuous monitoring helps program heads assess performance, especially in TB screening results in each Puskesmas area (WHO, 2021). The Depok City Health Office supports this statement by establishing a monitoring schedule every 3 months for all community Puskesmass in Depok City. This reporting schedule aligns with the research of Juliasih et al. (2020), which states that Puskesmas Perak Timur and Puskesmas Sawahan in Surabaya submit reports to the health department every 3 months.

The efficacy of TB treatment is influenced by various factors, including patient compliance with examinations and medication regimens, the presence and role of drug supervisors (PMOs), and the availability and quality of medications (Maulidya et al., 2017). Although these factors were not examined directly in this study, research findings at Puskesmas Tanah Baru suggest that community stigma against TB is a significant barrier. This stigma often leads to feelings of embarrassment and a reluctance to undergo examination for the detection of TB, potentially resulting in delayed or even avoided treatment. This can exacerbate treatment adherence and hinder efforts to manage tuberculosis (TB).

CONCLUSION AND SUGGESTION

The implementation of the Tuberculosis (TB) control program at Puskesmas Tanah Baru in terms of input (human resources, funding, and infrastructure) is categorized as good and should be maintained. Human resources have received appropriate training, funding is adequate, and facilities support TB service implementation despite the absence of a TCM machine. The process component is also good because promotive, preventive, and curative activities have been implemented according to national standards, involving cross-sector collaboration through the Kapitu task force. This process needs to be sustained and enhanced, particularly in the area of community education to address stigma. The output component is not yet fully optimal. Although the target for suspected case detection and treatment has been met, the treatment success rate has not reached the national target. Some patients fail to complete treatment due to the stigma and low adherence.

The weakest aspect identified is the output, especially the treatment success rate. Therefore, it is recommended to strengthen educational and promotional activities aimed at reducing TB stigma within the community, enhance regular monitoring and evaluation to detect problems early in treatment adherence, and intensify household contact screening and preventive therapy provision to boost treatment success and reduce new TB cases. Future researchers are advised to include informants from cross-sector partner, such as PPTI, Penabulu, and KOPI TB to enrich the evaluation of TB control program implementation in Depok City.

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