



The Role Of Community Health Centers In Improving Early Detection Of Tuberculosis (DENI TB) At The Long Alango Community Health Center, Bahau Hulu District, Malinau Regency In 2026

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ABSTRAK

Bakteri *Mycobacterium tuberculosis* merupakan penyebab utama tuberkulosis (TB) pada manusia. TB dapat menyebar melalui sekresi yang dikeluarkan oleh pasien penyakit pernapasan dari tenggorokan dan paru-paru, yang dapat menyebabkan batuk berdarah pada stadium lanjut. Penelitian ini bertujuan untuk meningkatkan deteksi dini kasus TB melalui program yang dilaksanakan di Puskesmas Long Alango menggunakan metode aktif dan pasif. Penelitian kualitatif ini menggunakan purposive sampling untuk memilih informan. Data untuk penelitian ini dikumpulkan melalui wawancara mendalam dan observasi, serta dokumentasi aktivitas harian informan. Hasil penelitian menunjukkan bahwa kasus TB terdeteksi melalui metode pasif dan aktif. Metode pasif dilakukan dengan memeriksa pasien yang datang ke puskesmas dengan gejala TB melalui pemeriksaan dahak, kemudian menjalani pengobatan selama enam bulan jika hasilnya positif. Metode aktif dilakukan melalui pemeriksaan kontak rumah tangga, skrining Deteksi Dini Tuberkulosis (DENI TB), dan peran bidan desa dan kader TB. Skrining dilakukan dari rumah ke rumah dengan mengumpulkan sampel dahak dari warga. Puskesmas Long Alango (UPTD) memainkan peran penting sebagai garda terdepan pelayanan kesehatan di daerah terpencil dan perbatasan, khususnya dalam deteksi dini tuberkulosis melalui program Deteksi Dini Tuberkulosis (DENI TB). Deteksi kasus dilakukan secara aktif dan pasif dengan melibatkan tokoh masyarakat, pemerintah desa, pos pelayanan kesehatan terpadu (posyandu), dan pencatatan melalui SITB. Pendekatan proaktif ini memungkinkan deteksi dan pengobatan kasus TB yang lebih efektif. Namun, implementasinya masih menghadapi kendala berupa keterbatasan jumlah kader, tenaga kesehatan, fasilitas, dan kesulitan akses ke wilayah tersebut.

ABSTRACT

Keywords

Community Health Center ;Early Detection; Tuberculosis

Mycobacterium tuberculosis bacteria are the main cause of tuberculosis (TB) in humans. TB can spread through secretions released by patients with respiratory diseases from their throats and lungs, which can cause bloody coughing in advanced stages. This study aims to improve early detection of TB cases through a program implemented at the Long Alango Community Health Center (UPTD Puskesmas Long Alango) using active and passive methods. This qualitative study used purposive sampling to select informants. Data for this study were collected through in-depth interviews and observations, as well as documentation of the informants' daily activities. The results of the study show that TB cases are detected through passive and active methods. The passive method is carried out by examining patients who come to the health center with TB symptoms through sputum examination, then undergoing treatment for six months if they test positive. The active method is carried out through household contact examination, Early Detection of Tuberculosis (DENI TB) screening, and the role of village midwives and TB cadres. Screening is conducted door-to-door by collecting sputum samples from residents. The Long Alango Community Health Center (UPTD Puskesmas Long Alango) plays an important role as the frontline of health services in remote and border areas, particularly in the early detection of tuberculosis through the Early Detection of Tuberculosis (DENI TB) program. Case detection is carried out actively and passively by involving community leaders, village governments, integrated health service posts (posyandu), and recording through SITB. This proactive approach enables more effective TB case detection and treatment. However, its implementation still faces obstacles in the form of limited numbers of cadres, health workers, facilities, and difficult access to the region.

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1. Introduction

The bacterium *Mycobacterium tuberculosis* is the source of infectious disease through *droplets* of sputum/saliva when active TB patients cough, sneeze, talk, or sing. Transmission occurs when other people inhale the contaminated air, especially during close and prolonged contact. Tuberculosis (TB) can spread through secretions released by patients with respiratory diseases from their throat and lungs (Suprihatin, 2019) . TB often attacks the lungs, but it can also attack the kidneys,

brain, spine, etc. In addition, TB can attack many parts of the body simultaneously.

As an illustration, TB can affect the lymph nodes and lungs (Centers for Disease Control and Prevention & Gresik Regency Central Statistics Agency, 2023) The effectiveness of the *Bacillus Calmette-Guérin* (BCG) in preventing the spread of TB remains inconsistent, despite the vaccine's ability to provide protection against the disease (Meri et al., 2022). The productive age group is one of several age groups vulnerable to the impact of TB.

Therefore, TB may have a detrimental effect on the quality of human resources particularly in areas with high tuberculosis rates (Nugraeni, 2020). Despite progress in global efforts to prevent and manage tuberculosis, the incidence of tuberculosis remains significant, especially in countries with underdeveloped health systems and poor economic conditions (Mayditanian, 2023). Worldwide, an estimated 10.6 million people contracted tuberculosis (TB), including 5.8 million men, 3.5 million women, and 1.3 million children, died from TB in 2022, according to the World Health Organization (WHO). TB can be found anywhere in the world and at any age. TB is preventable and curable. The global fight against TB has saved an estimated 75 million lives since 2000. Ending the TB epidemic by 2030 is one of the Sustainable Development Goals (World Health Organization, 2023).

Indonesia itself ranks second in the world in terms of the estimated number of new TB cases. With 60% of new TB cases, three countries—China, the Philippines, Pakistan, Nigeria, Bangladesh, Congo, and Myanmar (WHO 2023)—account for the majority of new cases. To date, tuberculosis remains one of the top ten causes of death worldwide, with 1.3 million deaths attributed to tuberculosis alone and 1.7 million deaths attributed to HIV (Bethan, 2022). Indonesia ranks second in terms of

the highest number of tuberculosis cases in 2023, with 30 countries accounting for 86% of new TB cases. In Indonesia, there are an estimated 1,090,000 TB cases with 125,000 deaths, and 165,116 cases of sputum-positive pulmonary TB (Sakina et al., 2021).

By improving its detection and reporting systems, Indonesia has demonstrated its commitment to combating tuberculosis. In 2022 and 2023, more than 724,000 new TB cases were detected, and in 2023, the number of cases increased to 809,000. This number is significantly higher than pre-pandemic levels, when the average number of cases was below 600,000 annually. In Indonesia and worldwide, tuberculosis (TB) remains a significant public health issue (Sugito, 2022). However, in the Bahau Hulu sub-district of Malinau Regency, North Kalimantan, TB treatment has reached 100 percent coverage among the 778,086 residents. In 2025, seven TB cases were recorded at the Long Alango Community Health Center in Bahau Hulu Subdistrict, Malinau District (PKM Profile, 2025).

Ministry of Health has recorded many successes due to significant acceleration. First, the Ministry of Health found 90 percent of new cases. Of these new cases, 100 percent of patients received treatment, including 90 percent of patients who received treatment until completion.

Additional findings show that 58% of people who have had close contact with tuberculosis have received Tuberculosis Prevention Therapy (TPT) (Tarmizi, 2024). The Ministry of Health uses a public-private partnership (PPP) approach. First, all health care facilities (*fasyankes*) in 34 provinces, both public and private, can participate in this program. Activities carried out include promoting internal and external training, providing access to laboratory tests, such as molecular/TCM tests and rapid microscopy tests, and logistics, such as medicines, through the Anti-Tuberculosis Drug (OAT) and Consumables (BHP) programs, including sputum pots and cartridges, for health facilities.

Due to the increasing number of tuberculosis cases in Indonesia, the government has initiated a tuberculosis prevention and control program (P2TB). This program covers all health efforts that prioritize promotive and preventive aspects while emphasizing curative and rehabilitative aspects to protect public health and reduce morbidity, disability, or mortality (Chomaerah, 2020). Epidemiological data and information on tuberculosis are essential for achieving tuberculosis control programs. Tuberculosis surveillance helps management make decisions about appropriate actions to anticipate and control tuberculosis. Tuberculosis surveillance also participates

in additional case management and P2TB examination programs (Bethan, 2022).

Provincial, district, and city governments must set regional tuberculosis control targets based on national targets and consider national strategies to achieve them. The goal of tuberculosis control programs is to prevent deaths and disabilities caused by tuberculosis (Sando, 2021). The WHO recommendation is contact screening to accelerate the detection of suspected TB cases, which are then immediately followed up with treatment and prevention of transmission. This is done as part of the national control plan to stop tuberculosis worldwide (World Health Organization, 2024). The active case finding strategy involves tracking individuals who have interacted with TB patients to identify suspected TB cases, who are then referred to healthcare facilities for further examination (Pramono et al., 2023).

Despite ongoing efforts to control TB, the disease remains a significant public health issue in Indonesia. The Long Alango Community Health Center (UPTD Puskesmas Long Alango) in Bahau Hulu District, Malinau Regency, North Kalimantan, also faces this problem, with TB cases continuing to rise. Community Health Centers (Puskesmas) in Bahau Hulu District, Malinau Regency, such as the Long Alango Community Health Center, provide primary health services to the

community and play an important role in tuberculosis management. This study aims to examine the role of the Long Alango Community Health Center in improving early detection of TB cases through the Early Detection of Tuberculosis (DENI TB) program. This study focuses on the role of community health centers in improving early detection and management of TB cases in very remote areas such as Bahau Hulu Subdistrict, Malinau Regency, where issues such as low population mobility and very low population density impact disease control strategies at community health centers.

2. Method

2.1. Research Design and Location

This study was conducted at the Long Alango Community Health Center, Bahau Hulu District, Malinau Regency, from January 2 to 31, 2026. The purpose of this qualitative study was to determine the role of the health center in the early detection and treatment of tuberculosis at the Long Alango Community Health Center, Bahau Hulu District, Malinau Regency.

2.2. Population and Sample

The information collected for this study consisted of two groups: key informants, namely the person in charge (PJ) who manages the tuberculosis program at the Long Alango Community Health Center, Bahau Hulu District, Malinau Regency, and regular informants, namely tuberculosis

employees at the Long Alango Community Health Center, Malinau Regency.

2.3. Data Collection Technique

Data for this study were collected through in-depth interviews and observations, as well as documentation of the informants' daily activities.

3. Result

Patient Visits to Health Facilities, Screening in Villages and Schools Table 3.1 Population and Sample of the Early Detection of Tuberculosis (DENI TB) Study

No	Description	Description	Number (Total)	Side Technique
1	Target Population	The entire community in the working area of the Long Alango Community Health Center (UPTD Puskesmas Long Alango) that is the target of Tuberculosis Screening (TB suspects, close contacts, and high-risk groups)	± All Screening Targets (368 people)	-
2	Reached Population	Residents registered in the 2025 Early Detection of Tuberculosis (DENI TB) program	7	-
3	Research Sample	All TB suspects registered in the 2025 Early Detection of Tuberculosis	7	Total Sampling

		(DENI TB) program at the Long Alango Community Health Center (UPTD Puskesmas Long Alango)		
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Note:

- The study population consists of all TB screening targets in the working area of the Long Alango Community Health Center, Bahau Hulu District, Malinau Regency, North Kalimantan Province
- The study sample used the Total Sampling technique, meaning all TB suspects recorded in the 2025 DENI TB data (7 people) were used as the study sample
- Data is sourced from the Early Detection of Tuberculosis Program (DENI TB) report of the Long Alango Health Center UPTD

Health Center.

The interview results showed that the Long Alango Community Health Center UPTD used a passive case finding method to identify patients who came to the Long Alango Community Health Center UPTD with complaints indicative of tuberculosis. When patients came with symptoms of tuberculosis, they were immediately directed to Cluster 3 to be examined for the possibility of tuberculosis. Patients are given a sterile container to store their sputum in the morning, which must then be returned the next day to the person in charge (PJ) and the Simple Laboratory to be examined for the presence of tuberculosis-causing bacteria. If the patient tests positive

for tuberculosis, they will be scheduled for regular check-ups and treatment at the Long Alango Community Health Center for 6 months. After the treatment period, another sputum test will be conducted to determine whether treatment should be stopped or continued, as the patient may still have tuberculosis.

Clinic

As of now, there is no clinic in Bahau Hulu Subdistrict, Malinau Regency.

Integrated Health Service Post and Village Midwife

As is well known, every village has at least one midwife and one nurse at the village health center, who are also program cadres from the Long Alango Community Health Center itself. When a villager has a health check at the village health center through the village midwife, the village midwife will report the data to the Community Health Center, as will patients who are villagers suspected of having tuberculosis. The village midwife will immediately ask the patient to come to the health center for a thorough examination and report the patient's data to the Tuberculosis Clinic, which will then be handled by the Tuberculosis (TB) Project Manager.

Household Contact Examination

Based on findings from interviews conducted with informants, one of the methods used by the Long Alango

Community Health Center to detect tuberculosis cases is to conduct household contact examinations of family members or individuals who live under the same roof and interact with patients suffering from tuberculosis. This examination consists of sputum examination and other examinations to support tuberculosis diagnosis. Household contact screening is conducted to reduce the risk of transmission to family members or individuals who live with and interact with patients.

Screening

The Long Alango Community Health Center's Tuberculosis (TB) Clinic has prepared several village cadres to assist the tuberculosis project manager in recording, reporting, and promoting health related to tuberculosis in the Long Alango Community Health Center's network area. Bahau Hulu Subdistrict has 6 villages and 13 RTs with 1 Puskesmas, 5 Pustu Health Posts, namely UPTD Puskesmas Long Alango, Pustu Apau Ping, Pustu Long Berini, Pustu Long Kemuat, Pustu Long Tebulo, and Pustu Long Uli, assisted by six tuberculosis cadres. However, the number of cadres is still insufficient.

Tuberculosis Early Detection Screening (DENI TB)

DENI TB screening is one of the early detection programs carried out by the Long Alango Community Health Center in collaboration with community leaders. This

activity is carried out through education, socialization, *door-to-door* visits to residents' homes to distribute sputum containers, and the collection of sputum containers filled with sputum the next day. All villagers who have been in contact with TB patients and are at risk, as well as those who are not at risk, are included in the program. The activity takes the form of screening through DENI TB, which involves collecting sputum in containers and taking it to a simple laboratory to be examined by laboratory staff and the tuberculosis case manager. If the DENI TB results show abnormalities, the patient will be referred for further examination by informing the health center staff that there is a patient with a positive result (+). Diagnosis through the simple laboratory at the Long Alango Community Health Center (UPTD Puskesmas) requires several days to obtain results because the tuberculosis (TB) coordinator and laboratory staff have other duties, making it difficult for them to focus on processing sputum samples. Early Detection of Tuberculosis (DENI TB) can be performed and diagnosed as it is the simplest method; however, the primary diagnosis is the sputum test (TCM). If the sputum test is positive and other diseases are detected, the Puskesmas doctor will recommend further referral to the Malinau District General Hospital.

4. Discussion

The Long Alango Community Health Center UPTD uses a passive method to assess the presence of tuberculosis in patients. Tuberculosis (TB) predominantly affects the respiratory system, spreading via airborne droplets that harbor *Mycobacterium tuberculosis* (M.tb) bacilli. When a person with active pulmonary tuberculosis coughs, sneezes, laughs, or even converses, they emit infectious droplet nuclei into the atmosphere, which can linger for hours—particularly in enclosed, inadequately ventilated spaces. Breathing in just a few bacilli could be enough to trigger an infection, especially in individuals with weakened immune systems or those who have been exposed for extended periods (Davidson et al., 2024).

Patients with a history of TB are referred to the hospital, where they are monitored and treated for signs of the disease using DENI TB. If positive, patients will be monitored and treated for six months. The Long Alango Community Health Center (UPTD Puskesmas) directly refers tuberculosis cases to the hospital. They only need to provide patient data to be entered into the Tuberculosis Information System (STIB) by the PJ TBC section of the Long Alango Community Health Center UPTD. This system can be consulted with the tuberculosis section of the Long Alango Community Health Center UPTD.

One of the measures taken by the Long Alango Community Health Center is that blood tests for individuals or groups at risk of tuberculosis cannot yet be carried out due to insufficient personnel and facilities at the health center. The blood testing program, which is carried out to prevent the risk of contact with individuals at risk of tuberculosis, has been submitted to the Health Office for staffing. The Long Alango Community Health Center also provides several programs to assist the Health Office in Population Control and Family Planning in the field of P2P as the TB Project Manager in conducting research, testing, and promoting health services related to TB in the local area. These programs are currently being coordinated with the Population Control and Family Planning Health Office, for example, X-rays, which are diagnostic tools used to identify and diagnose diseases. Diagnosis through X-rays is easier than diagnosis through TCM, which is more difficult. In addition, patients with other health conditions such as diabetes and obesity are recommended to use X-ray diagnosis.

The role of the Long Alango Community Health Center (UPTD) in the early detection of tuberculosis is very beneficial in supporting the reduction of TB cases in Indonesia. Several recent studies have shown that demographic factors (Kustanto, 2020), physical environment availability of

health workers and coverage of health care facilities (Kak et al., 2020) ; (Jiang et al., 2022) correlate with TB cases in several regions of Indonesia.

Screening methodologies are crucial for detecting both latent tuberculosis infection (LTBI) and active tuberculosis in individuals who are at heightened risk. Latent tuberculosis infection (LTBI) impacts almost one-fourth of the world's population and acts as a significant reservoir for potential future cases, especially if not properly managed within at-risk groups (Esmail et al., 2018) ; (Schrager & others, 2020) . Consequently, a successful tuberculosis control approach must encompass collaboration across various sectors, implementation of social protection initiatives, and enhancement of health systems to address systemic obstacles to care. Epidemiology and Pathogenesis. An approach that encompasses multiple sectors and is fueled by innovation is essential for achieving worldwide tuberculosis elimination goals (Mr. Rajesh Kumar & Sonam Sharma, 2025) .

5. Conclusion

Based on the research objectives and results mentioned above, it can be concluded that the role of the Long Alango Community Health Center (UPTD Puskesmas Long Alango) as the frontline in

very remote and border areas is very important in providing medical equipment and personnel to support medical and health workers in providing health services, such as Early Detection of Tuberculosis (DENI TB). In improving early detection, tuberculosis cases can be identified through programs that have been implemented, both actively and passively. The Long Alango Community Health Center UPTD already has a program in place to conduct Early Detection of Tuberculosis (DENI TB). Another strategy implemented is collaborating with community leaders, village heads in Bahau Hulu, and Posyandu. When a patient suspected of having tuberculosis is identified at a health facility, immediate treatment is conducted under the supervision of the Long Alango Health Center UPTD, accompanied by patient data recording in the SITB (Tuberculosis Information System) by the Tuberculosis (TB) Coordinator (TB) and reporting any suspected cases through sputum collection assisted by Pustu staff for screening. The sputum is then sent to the health center, where villagers who are suspected of having contact with the patient and are at risk will undergo screening through sputum collection and physical examination. If abnormalities are found, further examination will be carried out using a sputum test (TCM). In conclusion, the Long Alango Community Health Center UPTD

uses a proactive approach to assess the presence of tuberculosis in patients. By providing accurate information and implementing appropriate strategies, this cluster can effectively manage and treat tuberculosis cases. Among the many programs, many are running smoothly, though some still have shortcomings. For instance, the number of TB screening cadres is insufficient, and access remains extremely challenging in very remote and outer regions.

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