



Characteristics of Tuberculosis Patients at Okaba Community Health Center, Merauke Regency, 2023-2025

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ABSTRACT

Wilayah Indonesia Timur, khususnya Provinsi Papua Selatan, menghadapi beban ganda penyakit menular dengan insidensi Tuberculosis (TB) yang masih tinggi. Karakteristik klinis dan demografis pasien di tingkat layanan primer merupakan indikator vital untuk mengevaluasi efektivitas pemutusan mata rantai penularan. Penelitian ini bertujuan untuk menganalisis karakteristik demografis (usia, jenis kelamin) dan klinis (lokasi anatomi penyakit) pasien TB yang berobat di Puskesmas Okaba pada tahun 2025. Penelitian merupakan studi deskriptif observasional dengan desain cross-sectional dilakukan menggunakan data sekunder rekam medis. Pengambilan sampel menggunakan teknik Total Sampling pada seluruh pasien teregistrasi periode Januari 2023 hingga Desember 2025 dengan melihat karakteristik berdasarkan jenis kelamin, klasifikasi penyakit TB, serta usia yang terkena penyakit TB. Dari total 87 subjek penelitian, ditemukan distribusi gender yang relatif berimbang dengan rincian 43 laki-laki (49,4%) dan 44 perempuan (50,6%). Seluruh pasien yang terdiagnosis sebagai TB Paru sebanyak 80 pasien (91,9%), sementara temuan kasus TB Ekstra Paru sebanyak 7 pasien (8,1%). Secara demografis, mayoritas pasien terkonsentrasi pada rentang usia kerja produktif. Banyaknya kasus TB Paru mengindikasikan bahwa beban kasus di Puskesmas Okaba bersifat infeksius (infectious pool), yang meningkatkan risiko transmisi aerogen di komunitas. Intervensi kesehatan masyarakat harus difokuskan pada perlindungan kontak erat di lingkungan kerja dan rumah tangga.

ABSTRACT

Eastern Indonesia, particularly South Papua Province, faces a double burden of infectious diseases with a still high incidence of Tuberculosis (TB). Clinical and demographic characteristics of patients at the primary care level are vital indicators for evaluating the effectiveness of breaking the chain of transmission. This study aims to analyze the demographic (age, gender) and clinical (anatomical location of the disease) characteristics of TB patients treated at the Okaba Community Health Center in 2025. The

Keywords

Characteristics; Tuberculosis; Patient

research is an observational descriptive study with a cross-sectional design conducted using secondary medical record data. Sampling used the Total Sampling technique on all registered patients from January 2023 to December 2025 by looking at characteristics based on gender, TB disease classification, and age of TB sufferers. Of the 87 study subjects, a relatively balanced gender distribution was found with details of 43 men (49.4%) and 44 women (50.6%). A total of 80 patients (91.9%) were diagnosed with pulmonary TB, while 7 patients (8.1%) were found with extrapulmonary TB. Demographically, the majority of patients were concentrated in the productive working age range. The large number of pulmonary TB cases indicates that the caseload at Okaba Community Health Center is infectious, which increases the risk of aerogen transmission in the community. Public health interventions should focus on protecting close contacts in the workplace and household.

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1. Introduction

Tuberculosis (TB) remains a global health emergency and the leading cause of death from a single infectious agent worldwide. This disease, caused by the bacterium *Mycobacterium tuberculosis*, not only impacts physical health but also has severe social and economic consequences for sufferers and their families (Isbaniyah et al., 2021). Indonesia consistently ranks as the country with the second or third highest TB burden in the world after India, which demands serious attention in efforts to eliminate TB by 2030 (World Health Organization, 2024). Tuberculosis (TB) remains one of the most persistent public health threats in the world, including in Indonesia's underdeveloped, frontier, and outermost (3T) regions. In South Papua Province, particularly in Merauke Regency, TB elimination faces unique challenges rooted in the complex interaction between biological factors, regional ecological conditions, and accessibility of health services. The Okaba Community Health Center, as the frontline of health services in Okaba District, bears witness to how this disease burden continues to suppress the productivity of a community largely dependent on natural resources.

At the national level, the distribution of TB cases is uneven, with prevalence tending to be much higher in Eastern Indonesia, particularly Papua. Provinces in Papua face the dual challenge of a high infectious disease burden and extreme geographic constraints. Social determinants such as residential density, nutritional status, and unequal access to healthcare facilities contribute to the high transmission rate in this region (Marampa, 2018).

Merauke Regency, one of the largest regions in South Papua, has unique TB epidemiological characteristics. Okaba District, where the Okaba Community Health Center operates, is characterized by coastal and swampy topography. The humid environment often supports the survival of TB bacteria, while inter-village accessibility, dependent on river tides and road conditions, poses significant barriers to early diagnosis and treatment adherence (Setyohadi, 2014).

In addition to environmental factors, demographic characteristics and community behavior in the Okaba region also play a significant role. Community lifestyles, smoking habits, and understanding of cough etiquette and preventing transmission within the household are dynamic variables. Without a clear understanding of who the most

vulnerable groups are—whether men of productive age, the elderly, or children—health interventions are often ineffective and poorly targeted.

Okaba Community Health Center, as a primary health care facility (FKTP), plays a central role in spearheading the implementation of the *Directly Observed Treatment Short-course (DOTS)* strategy. Although the TB control program is well underway, evaluations of patient profiles seeking treatment are rarely published specifically. Routine data stored in the TB register (Form TB.03) often serve only as administrative reports without further analysis to determine disease spread patterns at the local level (Okaba Health Center, 2025).

Over the past three years (2023–2025), TB control efforts in Okaba have undergone a significant transformation. Geographically dominated by swamp and coastal ecosystems, Okaba creates a natural barrier for patients to access timely diagnosis and treatment (Okaba Health Center, 2025). Challenges such as distance and the cost of boat transportation often lead to diagnostic delays, leading to high transmission rates at the household level. Therefore, understanding patient characteristics is not just a statistical measure, but key to addressing the socio-economic barriers that exist on the ground.

The characteristics of TB patients in Okaba are unique. The high number of cases among productive-age individuals indicates a significant economic impact on families, given their role as primary breadwinners (fishermen and gatherers). Furthermore, the close link between TB and nutritional status, influenced by local food consumption patterns, creates a situation where infectious disease and malnutrition exacerbate each other. Patients often present with malnutrition, which medically weakens the immune response and delays recovery.

Tuberculosis (TB) remains a global health emergency and a major challenge to health development in Indonesia. Despite the

implementation of various elimination strategies, Indonesia remains one of the largest contributors to TB cases globally. Specifically, the epidemiology of TB in Indonesia shows significant regional disparities, with Eastern Indonesia, including Papua, recording case notification rates and prevalence consistently higher than the national average (Merauke Regency Health Office, 2025).

South Papua Province, with Merauke Regency as its population center, has unique social determinants of health. Residential density in certain settlements, inter-district population mobility, and geographic challenges in coastal areas such as Okaba District contribute to the dynamics of *Mycobacterium tuberculosis* transmission. *The Okaba Community Health Center, as a First-Level Health Facility (FKTP), holds a crucial mandate as the vanguard in both Passive Case Finding and Active Case Finding strategies.*

In terms of pathophysiology, TB can manifest as pulmonary and extrapulmonary TB. This distinction has significant epidemiological implications. Pulmonary TB, especially bacteriologically confirmed TB, is the primary source of transmission, maintaining airborne bacterial circulation via droplet nuclei. In contrast, extrapulmonary TB (such as TB meningitis, bone TB, or lymphadenitis) is generally not contagious but often indicates delayed diagnosis or the presence of severe immunological disorders in the patient (Tulu et al., 2026).

Throughout 2023–2025, there has been no comprehensive publication examining the profile of TB patients in the Okaba Community Health Center (Puskesmas) area. Routine data often ends up as administrative reports without in-depth analysis of who is sick and what their disease patterns are. Understanding demographic characteristics (who is most vulnerable) and clinical characteristics (how contagious the disease is) is the

foundation for designing evidence-based interventions. Therefore, this study was conducted to analyze the characteristics of 87 TB patients registered at the Okaba Community Health Center throughout 2023-2025, to provide a comprehensive picture of the "face" of TB in the region (Okaba Health Center, 2025).

Based on the description above, this study aims to examine the TB patient population in the Okaba Community Health Center (Puskesmas) and to provide a realistic picture of the characteristics of TB patients at the Okaba Community Health Center. Mapping the distribution by age, gender, and type of diagnosis is expected to provide baseline data for TB program managers at the Puskesmas and the Health Office to design strategies for active case detection and medication support that are more appropriate to the socio-cultural conditions of the Okaba community.

2. Methods

2.1. Design and location of research

The research is an observational descriptive study with a cross-sectional design. The study location was the Okaba Community Health Center, Merauke Regency, South Papua Province. This institution was chosen because it is a referral center for microscopic diagnostics and DOTS (*Directly Observed Treatment, Short-course*) treatment strategies for the community in Okaba District.

2.2. Population and sample

The target population was all residents within the Okaba Community Health Center's working area who were diagnosed with TB. The sampling technique used *total sampling* (census), where all patients recorded in the Community Health Center's TB.03 register from January 1, 2023, to December 31, 2025, were included as study subjects. Based on these

criteria, a total sample of 87 patients (N=87) was obtained.

2.3. Operational variables and definitions

Variables analyzed included demographic characteristics: gender (male/female) and age category (children, adolescents, adults, and elderly). Clinical Characteristics: Classification of anatomical location of the disease (Pulmonary TB vs Extrapulmonary TB).

2.4. Data Collection Techniques

Data were collected using secondary data from medical records and the Tuberculosis Information System (TB.03 register) of Okaba Health Center in 2023-2025.

2.5. Data Analysis

Data analysis was performed univariately to calculate frequency distributions and percentages. The results are presented in frequency distribution tables and narrated to discuss the implications of the findings for public health programs.

2.6. Research Ethics

This study used secondary data from the medical records of tuberculosis (TB) patients at a community health center (Puskesmas). All data used was anonymized, so there was no information that could directly or indirectly identify the patients. The researcher guarantees that the data will be used solely for scientific purposes and will maintain the confidentiality and security of information in accordance with research ethics principles and applicable laws and regulations. Access to the data was limited and permission was obtained from the relevant community health center.

Results

2.7. Characteristics Based on Gender

Table 1 Distribution of TB Patients by Gender (2023 - 2025)

Year	Gender				Total patients	Percentage (%)
	Man	Percentage (%)	Woman	Percentage (%)		
2023	14	56.0%	11	44.0%	25	29.1%
2024	14	41.2%	20	58.8%	34	39.5%
2025	15	53.6%	13	46.4%	28	32.6%
Total	43	49.4%	44	50.6%	87	100.0%

Based on Table 1, it was found that of the total 87 patients, 49.4% were male and 50.6% were female. The sex ratio of TB

patients at the Okaba Community Health Center was 97.7 (relatively balanced).

2.8. Characteristics Based on Disease Classification

Table 2 Distribution of Patients by Anatomical Location (2023 - 2025)

Year	Anatomical Location				Total patients	Percentage (%)
	Lungs	Percentage (%)	Extrapulmonary	Percentage (%)		
2023	24	96.0%	1	4.0%	25	28.7%
2024	28	82.4%	6	17.6%	34	39.1%
2025	28	100%	0	0.0%	28	32.2%
Total	80	91.9%	7	8.1%	87	100.0%

Based on Table 2, it is known that a total of 80 patients (91.9%) were diagnosed with Pulmonary TB and 7 cases of Extra

Pulmonary TB (8.1%) were registered at the Okaba Community Health Center throughout 2023 to 2025.

2.9. Age Characteristics

Table 3 Distribution of patients based on age characteristics

Age Characteristics	Age Range	Number of Patients (N)	Percentage (%)
Child	0-11 Years	4	4.6%
Teenager	12-25 Years	24	27.6%
Mature	26-45 Years	48	55.2%
Elderly	>45 Years	11	12.6%
Total		87	100.0%

Based on Table 3 above, based on age characteristics, it can be seen that 4 patients were children (4.6%), 24 were

adolescents (27.6%), 48 were adults (55.6%), and 11 were elderly (12.6%).

3. Discussion

The nearly balanced gender ratio (43 males: 44 females) at the Okaba Community Health Center provides interesting sociological insights. Globally, TB is often associated as a male disease. However, the high rate among women (50.6%) in Okaba indicates an intensive transmission pattern. In men (49.4%), the high number of cases is likely driven by behavioral risk factors (smoking) and high work mobility, which increase exposure to germs in public places. In women (50.6%), the higher rate compared to men suggests that the household environment is also a significant source of transmission. Women, who may spend more time at home with less than optimal ventilation, are particularly vulnerable to infection if another family member becomes ill. This underscores the importance of household contact investigation.

Research at the Okaba Community Health Center showed a relatively balanced distribution of TB patients by gender, with a slightly higher proportion of women (50.6%) than men (49.4%), and a sex ratio of 97.7. This finding contrasts with the global pattern reported by the World Health Organization in its Global Tuberculosis Report, which states that TB incidence is generally higher in men than in women (World Health Organization, 2023, 2025). However, the distribution of TB cases by gender can vary at the local level, influenced by social and environmental factors, as well as access to health services (Horton et al., 2016; Neyrolles & Quintana-Murci, 2009).

The slightly higher proportion of women in this study may be attributed to exposure factors within the household environment. Women generally play a larger domestic role and therefore spend more time indoors. This condition increases the risk of exposure to *Mycobacterium*

tuberculosis, especially if a family member has active TB. Research shows that household contact is a major risk factor for TB transmission, with the risk of infection significantly higher than in the general population (Fox et al., 2013). Furthermore, physical home environmental conditions, such as suboptimal ventilation and overcrowding, can increase the likelihood of droplet transmission in enclosed spaces (Lönnroth et al., 2009).

Furthermore, possible differences in healthcare-seeking behavior also need to be considered. Women tend to be more responsive to disease symptoms and more active in utilizing healthcare facilities than men, thus making TB cases in women more likely to be detected¹⁴. This may contribute to the higher proportion of female cases appearing in healthcare data, even though epidemiologically men are often reported to be at greater risk.

Furthermore, recent studies have shown that differences in TB distribution by sex are influenced not only by biological factors but also by social factors such as mobility, gender roles, and access to healthcare (Rickman et al., 2025; Ugwu et al., 2026). In the Indonesian context, research also shows that gender is not always significantly associated with TB incidence, so the distribution of cases can appear balanced or even higher among women in some regions (Suryanti et al., 2025).

Thus, although the results of this study indicate a relatively balanced distribution with a higher tendency among women, this finding can still be explained by a combination of domestic exposure factors, home environmental conditions, and health-seeking behavior. Therefore, TB control efforts need to strengthen household contact investigations and improve early detection, particularly among at-risk groups within the household environment.

Data from 2023-2025 showing that 91.9% of patients suffered from Pulmonary TB has serious epidemiological implications. Unlike Extra Pulmonary TB which is a dead-end infection (not contagious), Pulmonary TB is the engine driving the epidemic. The fact that patients suffer from pulmonary infections means that each patient has the potential to be a source of infection for the surrounding environment. If it is assumed that one untreated Pulmonary TB patient can infect 10-15 people per year, then the existence of a source of infection in the Okaba community requires very strict monitoring of medication adherence to prevent an explosion of cases in the following year.

The 8.1% figure indicates that tuberculosis manifestations in the Okaba Community Health Center's work area are not limited to the lungs, but also spread to other organs (such as the pleura, lymph nodes, bones, or abdomen). Although the proportion appears small compared to pulmonary TB, extrapulmonary TB cases present unique challenges in their management. Epidemiologically, the proportion of extrapulmonary TB in developing countries typically ranges from 15-20%. The 8.1% figure found at the Okaba Community Health Center is likely influenced by the diagnostic capacity of primary health care facilities. The diagnosis of extrapulmonary TB is often more difficult to establish than pulmonary TB because it requires more complex supporting examinations, such as tissue biopsy, fine needle aspiration (FNAB), or advanced radiological imaging that may not be fully available at the Community Health Center. This situation raises the suspicion of *under-diagnosis* (undetected cases), where patients with vague symptoms of Extrapulmonary TB may not be properly diagnosed, or these patients are directly referred to Merauke Regional Hospital for further treatment so that their data is not fully recorded in the routine treatment register of the Community

Health Center. Nevertheless, the presence of 8.1% of Extrapulmonary TB patients requires vigilance of health workers at the Okaba Community Health Center to not only focus on respiratory symptoms (cough), but also be sensitive to non-respiratory symptoms such as swollen lymph nodes or chronic bone pain in the community, to ensure no cases are missed. The finding that the majority of patients were of productive age is a warning to the economic stability of families in Okaba District. TB is a disease that causes catastrophic costs.

When individuals of productive age become ill, they face two costs: direct costs (transportation to the community health center) and indirect costs (loss of income due to inability to work, farm, or fish). In a developing region like Okaba, the loss of productivity of these 72 individuals of productive age can negatively impact the economic well-being of their families, creating a cycle of poverty and disease that is difficult to break.

Research at Okaba Community Health Center revealed an interesting phenomenon that differs from global trends. TB patients were predominantly female (50.6%), slightly higher than males (49.4%).

This finding differs from the WHO (2023) report and the Indonesian Health Profile, which generally place men as the most affected. However, the high number of cases among women in the Okaba region can be explained through an analysis of local domestic and socio-cultural environmental risk factors.

- Indoor Air Pollution

In rural and coastal areas like Okaba, indoor cooking still relies heavily on biomass fuel (firewood) and kitchen ventilation is minimal. A study by Rumende et al. showed that continuous exposure to kitchen smoke containing carbon particulates can weaken the lung's defense mechanism (alveolar macrophages), putting women who spend more time in the kitchen at higher risk of TB infection, even if they do not smoke.

- Close Contact Intensity

Socioculturally, women in Okaba play a key role in family care. When a family member (husband, child, or parent) falls ill with TB, women are the ones who provide the most care and interact intensively. This increases the risk of droplet transmission within the household (household transmission). This high rate among women is a strong indicator that TB transmission in the Okaba region occurs more frequently within the household than in the workplace or public spaces.

- Delayed Diagnosis

The social stigma surrounding women with TB is often more severe. It's possible that women tend to delay testing until symptoms worsen due to fear of being ostracized or because of household chores, so that by the time they arrive at the community health center, their clinical condition is already advanced.

This finding provides an important signal for the TB Program Holder of Okaba Health Center that the target of household contact screening (contact tracing) should be prioritized on housewives and other female family members.

4. Conclusion

Based on 2025 data analysis at the Okaba Community Health Center, it was concluded that the potential for TB transmission was at its maximum. The study showed that 80 patients (91.9%) were diagnosed with pulmonary TB, indicating that all cases identified had the potential to transmit the disease to others. Furthermore, this disease increases population vulnerability. This is because it attacks the productive age group, which is the backbone of the economy, with a nearly equal risk distribution between men and women. The finding of Extrapulmonary TB in 7 patients (8.1%) indicates the need for evaluation of

diagnostic capacity to ensure that no non-respiratory cases are missed.

Based on the above conclusions, Okaba Community Health Center staff are advised to conduct aggressive contact tracing on the patient's family, considering that most cases involve contagious pulmonary TB. Furthermore, active screening needs to be expanded to workplaces and other public gathering areas (markets/ports). Healthcare workers are also advised to refresh their knowledge on the clinical symptoms of extrapulmonary TB to minimize underdiagnosis.

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