Innovative Approaches in Health Science Journal

ORIGINAL
Published Online: August 02, 2025
https://doi.org/10.1234/wwn3jh86

Trends in Tuberculosis Prevalence in the Work Area of Waepandan Community Health Center from 2022 to 2025

Indriyati Lainuru[a] | **Harianti Fajar**[a]

[a]Department of Nursing, High School of Health Science Pasapua Ambon, Indonesia.

Abstract

Background: Tuberculosis (TB) remains one of the most prevalent infectious diseases globally. It is caused by Mycobacterium tuberculosis, which is transmitted through airborne droplets. In the Waepandan Community Health Center coverage area, there were 2 confirmed TB cases out of 4 suspected cases in 2022. This number increased significantly to 11 confirmed cases from 20 suspected cases in 2025, indicating a concerning rise in incidence. **Methods:** This study used a quantitative approach with a descriptive design. The sampling technique was total sampling, involving all individuals who were suspected of having tuberculosis in the work area of Waepandan Health Center in 2025. **Results:** The analysis showed an increase in both the number of suspected and confirmed TB cases over the study period. This trend suggests a growing public health concern that requires immediate and targeted prevention strategies. **Conclusion:** The rising number of TB cases in the Waepandan Health Center area highlights the need to strengthen early detection, community education, and environmental health interventions. Preventive efforts must be enhanced to control TB transmission effectively.

Keywords: Tuberculosis, Prevention, Waepandan Health Center, Infectious Disease, Public Health

1. Introduction

Tuberculosis (TB) is a directly communicable disease caused by the bacterium Mycobacterium tuberculosis. TB remains a major global health concern, contributing significantly to morbidity, mortality, and challenges in diagnosis and treatment. Along with HIV/AIDS and malaria, TB is prioritized in global public health efforts as part of the Sustainable Development Goals (SDGs) (Kementerian Kesehatan Republik Indonesia, 2018).

The disease is primarily transmitted through airborne droplets expelled when an infected person with active pulmonary TB coughs or sneezes (Smeltzer, 2016; Price & Wilson, 2016). Although Mycobacterium tuberculosis can be easily killed by direct sunlight, it may survive for several hours in dark, humid environments.

Indonesia ranks as the country with the second highest TB burden globally, following India. According to the World Health Organization (2020), approximately 10 million people developed TB in 2019. Despite a decline in new TB cases, the reduction remains below the target set by the End TB Strategy, which aimed for a 20% reduction between 2015 and 2020. In reality, only a 9% cumulative decline was achieved over that period.

To accelerate progress, the WHO replaced the “Stop TB” initiative with the “End TB” strategy, which seeks to eliminate the global TB epidemic. The program has three key indicators: an 80% reduction in global TB incidence by 2030, and zero TB-related medical costs for patients (Mahara et al., 2018).

Nationally, Indonesia reported 443,236 TB cases in 2021, an increase from 393,323 cases in 2020 (Kementerian Kesehatan Republik Indonesia, 2020). In the first half of 2022 alone, 205,927 new pulmonary TB cases were identified and treated. Data from the Integrated Tuberculosis Information System (SITT) indicated that 385,295 pulmonary TB cases were managed in 2021, with a total of 543,874 notified TB cases and 11,993 TB-related deaths. Males consistently account for a higher proportion of TB cases compared to females, potentially due to higher exposure to TB risk factors such as smoking. In 2020, West Sumatra recorded 40,869 suspected TB cases, of which 5,399 were confirmed, including 3,273 cases in males and 2,126 in females (Kementerian Kesehatan Republik Indonesia, 2020).

According to Andayani (2020), the number of smear-positive pulmonary TB cases increased between 2011 and 2015. Forecasts suggested a potential decline between 2016 and 2020; however, time series analysis based on gender predicted a continuous increase, with the highest number of cases in 2018 expected among males (222 cases) and females (141 cases). A

Received: 13 May, 2024 | Accepted: July 08, 2025

study by Kristini and Hamidah (2020) found that 71.4% of respondents were exposed to TB patients for more than eight hours daily, while only 1.4% were classified as undernourished, suggesting prolonged exposure is a more significant risk factor than nutritional status.

Given the persistently high burden of tuberculosis in Indonesia and its significant public health impact, particularly in areas with limited healthcare access, it is crucial to examine localized trends in TB prevalence. The increasing number of suspected and confirmed TB cases in the Waepandan Community Health Center's work area between 2022 and 2025 highlights the need for targeted prevention and control strategies. This study is important for providing evidence-based insights into the epidemiological patterns of TB at the local level. The findings are expected to inform policy decisions, strengthen health interventions, and support the achievement of national and global TB reduction targets, especially within the framework of the End TB Strategy and the Sustainable Development Goals (SDGs).

2. Materials and Methods

This study employed a descriptive research design to examine the prevalence of tuberculosis in the working area of the Waepandan Community Health Center from 2022 to 2025. The research was conducted in January 2025. The data were obtained from the medical records of patients suspected of having tuberculosis during the specified period. A total sampling technique was used, in which all available records of suspected TB cases from 2022 to 2025 were included in the analysis.

3. Results

Table 1. Distribution of Tuberculosis Prevalence by Sex in the Working Area of Waepandan Community Health Center, 2022–2025

Year	Suspected number		TCM result (+)		Percentage (%)
	Man	Woman	Man	Woman	
2022	2	2	1	1	50
2023	2	7	2	0	22
2024	4	3	4	1	72
2025	1	1	1	1	100

The data in Table 1 shows fluctuations in the prevalence of tuberculosis (TB) cases confirmed by TCM testing in the working area of Waepandan Community Health Center from 2022 to 2025. In 2022, 50% of suspected TB cases tested positive, with one male and one female confirmed. The prevalence decreased to 22% in 2023, with only male patients testing positive. A significant increase occurred in 2024, where 72% of suspected cases were confirmed, and notably all four male suspects tested positive. By 2025, the prevalence reached 100%, as both suspected cases (one male and one female) were confirmed positive. This upward trend highlights the need for strengthened TB prevention, early detection, and targeted intervention efforts, particularly among men who consistently show higher TCM-positive rates across the years.

4. Discussion

The data presented in Table 1 reveal a fluctuating yet concerning trend in tuberculosis (TB) prevalence by sex in the Waepandan Community Health Center catchment area between 2022 and 2025. Notably, male patients consistently showed higher proportions of confirmed TB cases compared to females—especially in 2024, when all four confirmed cases occurred in men, and in 2025 with a 100% positivity rate across both sexes.

This male preponderance aligns with global patterns. Meta-analyses and prevalence surveys confirm that TB prevalence is significantly higher in men than in women, with male-to-female (M:F) prevalence ratios reaching approximately 2:1 (Horton et al., 2016) . Similar findings in Zimbabwe reported men having a 53% greater risk of developing TB than women, underscoring the biological and social mechanisms that drive this disparity (Mdlela et al., 2021)

Biological differences, including hormonal and genetic factors affecting immune response, as well as differential social exposures and health-seeking behaviors, contribute to the observed sex gap in TB incidence (The Lancet Public Health, 2025; Horton et al., 2016). In low- and middle-income countries—such as Indonesia—the disparities tend to be more pronounced due to occupational exposure and socioeconomic inequalities (Horton et al., 2016). Indonesia-specific data further support these findings. A case-control study found that 56.6% of pulmonary TB cases were male, reinforcing the national trend of higher TB burden among men (Indonesia risk factors study, 2023)

Another modeling study also found significant age- and sex-related differences in TB spread patterns in Indonesia, underscoring the need for disaggregated data in TB surveillance and strategies.

5. Conclusions

The study revealed fluctuating trends in tuberculosis (TB) prevalence within the Waepandan Community Health Center work area from 2022 to 2025. The data showed a consistently higher number of confirmed TB cases among men compared to women, with the highest prevalence recorded in 2025. This pattern aligns with national and global findings indicating that men are more susceptible to TB, possibly due to behavioral, biological, and occupational factors.

The findings emphasize the need for gender-sensitive TB control strategies, particularly those targeting early detection, health education, and risk reduction among men. Strengthening surveillance, improving health services access, and integrating targeted interventions into TB programs are essential steps to achieve the national End TB targets and reduce the disease burden in the Waepandan area.

Conflict of Interest

There is no conflict of interest

References

Andayani, S. (2020). Prediksi kejadian penyakit tuberkulosis paru berdasarkan jenis kelamin. *Jurnal Keperawatan Muhammadiyah Bengkulu*, *8*(2), 135–140. https://doi.org/10.36085/jkmu.v8i2.1063

Horton, K. C., MacPherson, P., Houben, R. M. G. J., White, R. G., & Corbett, E. L. (2016). Sex differences in tuberculosis burden and notifications in low- and middle-income countries: A systematic review and meta-analysis. *PLOS Medicine, 13*(9), e1002119.

Kementerian Kesehatan Republik Indonesia. (2018). *Tuberkulosis*. https://www.kemenkes.go.id

Kementerian Kesehatan Republik Indonesia. (2020). *Tuberkulosis*. https://www.kemenkes.go.id

Kristini, T., & Hamidah, R. (2020). Potensi penularan tuberculosis paru pada anggota keluarga penderita. *Jurnal Kesehatan Masyarakat Indonesia*, *15*(1), 24–28. https://doi.org/10.26714/jkmi.15.1.2020.24-28

Mahara, G., Yang, K., Wang, W., Guo, Y., Yang, C., & Yin, J. (2018). Socio-economic predictors and distribution of tuberculosis incidence in Beijing, China: A study using a combination of spatial statistics and GIS technology. *Medical Sciences*, *6*(2), 26. https://doi.org/10.3390/medsci6020026

Mdlela, R., et al. (2021). Effect of gender on clinical presentation of tuberculosis (TB) and TB-HIV coinfection: Findings from Zimbabwe. *PMC Journal (Harare)*.

Price, S. A., & Wilson, L. M. (2016). *Patofisiologi: Konsep proses-proses penyakit* (Edisi ke-4). EGC.

Smeltzer, F. B. (2016). *Textbook of medical-surgical nursing*. Lippincott Williams & Wilkins Pty, Limited. https://books.google.co.id/books?id=FobljwEACAAJ

Suryawan, D. A., & Siagian, T. H. (2021). Sex and age group differences in the spread of tuberculosis in Indonesia: An agent-based modeling study. *Jurnal Aplikasi Statistika & Komputasi Statistik, 13*(2).

The Lancet Public Health. (2025). Sex differences in the risk of *Mycobacterium tuberculosis* infection. *The Lancet Public Health*.

World Health Organization. (2020). *Global tuberculosis report 2020* (pp. 99–117). https://apps.who.int/iris/bitstream/handle/10665/336069/9789240013131-eng.pdf