

**EXPLORING TUBERCULOSIS LANGUAGE IN CONTEXT: A DISCOURSE ANALYSIS
OF TB NARRATIVES IN MADANG PROVINCE, PAPUA NEW GUINEA*****Dr. Gigil Marme, PhD**

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ABSTRACT

Introduction: Tuberculosis (TB) in Papua New Guinea is shaped not only by biomedical realities but also by language, culture, and structural constraints. This study aimed to understand the languages that the community and healthcare providers use to provide TB care services in Madang Province, Papua New Guinea. **Methods:** This study applies Critical Discourse Analysis (CDA) to semi-structured interviews with health workers in Madang Province to examine how TB is communicated and understood from January to May 2026. A purposive sample of 15 healthcare workers were recruited from six primary healthcare facilities. **Results:** Findings reveal a discursive ecosystem in which metaphors (“white ants eating a tree,” “jump jump/kalap kalap”), stigma (“killer disease,” “dai pinis”), and cultural beliefs (sorcery, poison) intersect with systemic barriers, including transportation and diagnostic shortages. Health workers adapt their language to patients' literacy levels, balancing biomedical terminology with local expressions to promote treatment adherence and reduce fear. **Conclusion:** The study highlights how language mediates between biomedical authority and local cultural meaning, thereby shaping patient behavior and community perceptions. It calls for culturally grounded communication strategies, stigma-sensitive discourse, and structural support to strengthen TB control in Papua New Guinea.

KEYWORDS: Tuberculosis, Critical Discourse Analysis, Health communication, Papua New Guinea.

INTRODUCTION

Tuberculosis (TB) remains a leading infectious cause of morbidity and mortality worldwide, disproportionately affecting low- and middle-income countries. Despite significant advances in diagnosis, treatment, and prevention, TB continues to impose a substantial burden on health systems and communities. According to the World Health Organization (WHO), an estimated 10 million people develop TB each year, and millions continue to suffer severe illness and die from the disease.^[1] The emergence and spread of multidrug-resistant tuberculosis (MDR-TB) have further complicated global TB control efforts, posing serious challenges to treatment effectiveness and health service delivery.

In Papua New Guinea (PNG), TB remains a major public health concern and is consistently reported as one of the leading causes of hospital admissions and discharges across healthcare facilities.^[2,3] The country has one of the highest TB burdens in the Pacific region, with an estimated prevalence of 432 cases per 100,000 people and a mortality rate of 51 deaths per 100,000 people.^[4,5] The growing burden of MDR-TB further exacerbates the situation. There is increasing evidence of MDR-TB among both newly diagnosed and previously treated patients, highlighting ongoing transmission and treatment challenges.^[6] Furthermore, weaknesses in surveillance systems, limited access to diagnostic services, and incomplete health information systems make it difficult to determine the true extent of MDR-TB in many parts of the country.

TB control in PNG is particularly challenging in rural and remote communities, where geographic isolation, inadequate health infrastructure, poverty, and sociocultural factors shape health-seeking behaviour and treatment adherence.^[7] In these settings, biomedical explanations of disease often coexist with traditional understandings of illness, creating complex communication environments where patients and healthcare providers negotiate the meanings of disease, diagnosis, and treatment.^[8,9] Consequently, effective health communication has become increasingly important for supporting early diagnosis, treatment adherence, and community awareness.

This study is significant because PNG's unique linguistic and cultural diversity profoundly shapes health communication practices. PNG is recognized as the world's most linguistically diverse country, with more than 850 languages.^[10] This diversity poses considerable challenges for healthcare providers who must communicate complex biomedical concepts, such as tuberculosis, to patients from diverse linguistic and cultural backgrounds.^[11]

These communication challenges are compounded by socioeconomic and educational inequalities.^[12] More than 85% of the population lives in rural and remote areas, where access to healthcare, education, and government services remains limited. National literacy levels remain relatively low compared with those of neighboring Pacific countries, creating additional barriers to understanding biomedical terminology and health information.^[13] As a result, healthcare workers frequently adapt their communication strategies, using local languages, metaphors, analogies, and culturally grounded explanations to convey health messages.

Understanding how TB is discussed, explained, and interpreted in clinical and community settings is essential to strengthening TB control efforts.^[14,15] Insights from this study could inform culturally appropriate health promotion strategies, improve patient-provider communication, and support the development of language-sensitive TB education materials. The findings may also help policymakers, health managers, clinicians, and public health practitioners design interventions that more effectively meet the communication needs of diverse populations.

Previous research on tuberculosis in PNG has largely focused on epidemiological trends, disease prevalence, treatment outcomes, drug resistance, and health system challenges.^[4,16] Studies have documented the persistence of TB and MDR-TB, highlighting factors such as delayed diagnosis, treatment interruptions, inadequate health infrastructure, and barriers to healthcare access. While these studies have provided valuable insights into the biomedical and health system dimensions of TB control, they have paid relatively little attention to the

role of language and communication in shaping TB-related knowledge and experiences.^[17,18]

Globally, health communication research shows that language plays a critical role in shaping how individuals understand disease causation, risk, prevention, and treatment. Culturally meaningful narratives, metaphors, and locally relevant expressions can influence health behaviors and improve engagement with healthcare services.^[19,20] In multilingual and culturally diverse settings, discourse about illness can significantly affect health literacy, treatment-seeking behavior, and adherence to medical advice.^[20]

However, few studies in PNG have examined how healthcare encounters linguistically construct and communicate about tuberculosis. Specifically, little is known about the language choices, metaphors, explanatory models, and communicative strategies healthcare workers use when discussing TB with patients and communities. This gap is important because effective communication is critical to successful TB prevention and control. Without a clear understanding of how TB-related messages are delivered and interpreted, health promotion interventions may fail to resonate with local populations or address existing misconceptions about the disease.

This study explores tuberculosis discourse in Madang Province, PNG, with particular attention to how healthcare workers communicate TB-related information to patients and communities. Using a discourse-analytic approach, the study examines the language, metaphors, narratives, and communicative practices used in TB discussions within healthcare settings. By investigating how TB is explained, understood, and negotiated through language, the research seeks to generate insights that can strengthen culturally appropriate health communication strategies and contribute to more effective TB control programs in PNG.

MATERIALS AND METHODS

This study was grounded in a qualitative interpretive paradigm, which holds that meanings are socially constructed through human interactions and experiences. Within this framework^[21], TB discourse was understood as a socially produced phenomenon in which knowledge is generated through narratives and shared interpretations rather than through objective measurement.^[9,11] This philosophical stance enabled the study to examine how healthcare workers construct and communicate meanings about TB within their sociocultural and healthcare contexts.

The study employed a discourse analytic design, integrating Critical Discourse Analysis (CDA) with thematic coding to examine the language, meanings, and social dimensions embedded in TB narratives.^[22,23] Data were collected through semi-structured interviews with purposely selected TB officers and healthcare workers

from six primary healthcare facilities in Madang Province from January to May 2026. Open-ended questions elicited participants' experiences and perspectives on TB communication, patient responses, and community perceptions of the disease.

Data analysis followed Fairclough's three-dimensional model of CDA.^[24] At the textual level, the analysis focused on metaphors, stigma-related language, and explanations of TB transmission. At the discursive practice level, it examined how participants adapted TB-related messages to accommodate varying literacy levels and cultural beliefs. At the social practice level, it explored how TB discourse reflected broader structural challenges, including barriers to healthcare access, diagnostic limitations, and local cultural worldviews. Combining CDA with thematic analysis enabled a comprehensive examination of how language both shapes and is shaped by the social realities surrounding TB.^[21,24]

Conceptual Framework

This study was guided by Critical Discourse Analysis (CDA), which conceptualizes language as a social practice that both reflects and shapes social realities.^[25] The study applied CDA across three interconnected levels. At the textual level, the analysis examined metaphors, stigma-related expressions, and other linguistic choices used to describe TB and its effects. At the discursive practice level, the study explored how health workers and community members adapted TB-related language to accommodate varying literacy levels,

cultural beliefs, and communication needs. At the social practice level, the analysis investigated how TB discourse reflected broader structural and sociocultural conditions, including transportation challenges, diagnostic constraints, health system limitations, and local cosmological beliefs. By examining TB narratives across these three dimensions, the framework provides a comprehensive understanding of how language constructs meanings around TB and influences perceptions, experiences, and responses to the disease within the community.^[26]

Trustworthiness: Credibility, transferability, dependability, and confirmability

To ensure the trustworthiness of the findings, credibility was established through triangulation of data across multiple study sites; transferability through rich and detailed explanations and descriptions that enable readers to assess the applicability of the findings to similar contexts; dependability through a transparent, systematic coding process and creating an audit trail; and confirmability through reflexive journaling to minimize researcher bias.^[27–29]

FINDINGS

As shown in Table 1, eight themes emerged: metaphors of TB, fear and stigma, biomedical vs. local knowledge, compliance narratives, structural challenges, community perceptions, comforting discourses, and transmission explanations. Together, these themes form a discursive ecosystem in which TB is constructed as both a biomedical and a cultural phenomenon.

Table 1: Coding Framework for TB Discourse Analysis.

Code	Definition	Example from Transcript
Metaphors of Tuberculosis	Use of imagery or analogies to explain TB symptoms, transmission, or effects.	"White ants eating a tree," "Rain clouds before rain," "Jump jump/kalap kalap."
Stigma and Fear	Language that frames TB as shameful, deadly, or socially isolating.	"Killer disease," "dai pinis (dead sentence)," "Patients are ashamed."
Biomedical vs. Local Knowledge	Tension between medical terminology and local cultural beliefs or language.	"Positive result" avoided; TB explained as "bacteria in your body." Villagers attribute TB to sorcery or poison.
Compliance Narratives	Discourse around adherence to treatment, defaulting, and health worker strategies.	"You must be faithful to the drugs," "Patients discontinue after two months thinking they are cured."
Structural Challenges	References to systemic barriers in TB care delivery.	"Lack of transport," "No GeneXpert machine," "Shortage of manpower and drugs."
Community Perceptions	How communities interpret TB, including cultural framing and collective responses.	"TB caused by sorcery or poison," "Villagers self-report prolonged coughs."
Comforting Discourse	Language used to reassure patients and reduce fear or shame.	"TB is not something to be afraid of," "You will be cured if you take your medications."
Transmission Explanations	How health workers describe TB spread to patients.	"When you talk, sing, or cough, the air goes to another person," "Bacteria can jump (kalap) to others."

Participants socio-demographic features

A total of 15 participants were recruited for the study. Participants were predominantly male, with a mean age of 34 years. All had tertiary qualifications and more than five years of professional experience. This demographic

profile strengthened the credibility of the findings, as participants had substantial exposure to TB management and health communication practices. Their formal education and professional training enabled them to critically interpret the language and narratives

surrounding TB, while their extensive field experience provided rich insights into how TB is discussed and understood within local communities. The convergence of educational attainment and professional experience suggests that the discourses identified in this study

reflect informed observations grounded in both biomedical knowledge and practical engagement with patients and communities. Table 2 presents the participants' demographic characteristics.

Table 2: Participants socio-demographic features.

Participant ID	Gender	Position	Education	Years of work experience
001	Male	TB program officer	Diploma	10
002	Female	TB Patient	Subsistence farmer	2
003	Male	Nursing officer	Diploma	8
004	Male	TB program officer	Certificate	13
005	Female	Community health worker	Certificate	15
006	Male	TB program officer	Certificate	22
007	Male	Community health worker	Certificate	7
008	Female	Nursing officer	Diploma	9
009	Female	Community health worker	Certificate	15
010	Male	TB program officer	Certificate	23
011	Male	Nursing Officer	Diploma	17
012	Male	Nursing Officer	Diploma	11
013	Female	Health Extension Officer	Bachelor	8
014	Female	TB program officer	Certificate	15
015	Male	TB program officer	Certificate	13

Metaphors of Tuberculosis

Many participants reported using metaphors to explain tuberculosis to patients. Metaphors such as “white ants eating a tree” (Male participant, 010) and “jump jump (*local language* “*kalap kalap*”) (Female participant, 014) made TB tangible but also reinforced fear. The use of metaphors such as “white ants eating a tree” and “jump jump/kalap kalap” demonstrates how communities in Madang Province draw on familiar experiences to make sense of TB. The metaphor of white ants slowly consuming a tree effectively conveys the progressive and often invisible nature of TB's impact on the body, making biomedical concepts more accessible to community members. Similarly, the metaphor “jump jump” may reflect local observations of symptom progression or the perceived movement of illness within the body. While these metaphors facilitate understanding, they also appear to reinforce fear by portraying TB as a destructive force. This finding suggests that metaphors serve a dual communicative function, enhancing comprehension while simultaneously shaping emotional responses to the disease. Within the Culture-Centered Approach, these expressions represent culturally embedded ways of communicating health information that resonate with local experiences and knowledge systems.

Fear and Stigma

TB was framed as a “killer disease” or “dai pinis” (Male participant, 015), discouraging disclosure. Health workers countered this with comforting discourse. The framing of TB as a “killer disease” or “dai pinis” highlights the strong association between TB and death within local discourse. Such language contributes to stigma by positioning TB as a condition linked to

inevitable mortality, thereby discouraging individuals from disclosing symptoms or seeking timely treatment. The repeated use of fatalistic expressions may strengthen community fears and reinforce social distancing from people affected by TB. However, the study also found that health workers actively challenged these narratives through reassuring and supportive discourse. By emphasizing that TB is treatable and curable when medication is completed, health workers attempted to reframe the disease from a death sentence to a manageable health condition. This reflects the Culture-Centered Approach, which emphasizes the importance of culturally responsive communication strategies that address community beliefs while promoting positive health behaviors.

Community Perceptions

Villagers linked TB to sorcery or poison (Female participant, 012), yet also self-reported prolonged coughs (Male participants, 011), showing coexistence of biomedical and cultural reasoning. The coexistence of beliefs that TB may be caused by sorcery or poison alongside recognition of symptoms such as prolonged coughing illustrates the pluralistic nature of health knowledge in Madang Province. Rather than viewing biomedical and cultural explanations as mutually exclusive, participants often drew on both frameworks simultaneously. Beliefs in sorcery or poisoning reflect long-standing cultural interpretations of illness causation, while self-reporting of persistent cough indicates awareness of biomedical indicators of TB. This coexistence demonstrates that local understandings of disease are dynamic and negotiated rather than fixed. For health communication initiatives, the finding highlights the importance of acknowledging cultural beliefs rather

than dismissing them, as culturally sensitive engagement may facilitate greater acceptance of biomedical messages.

Structural Challenges

Transport shortages, lack of diagnostic tools, and manpower constraints limited effective communication and follow-up (Male participant, 009; Female participant, 004). The findings indicate that transport shortages, limited diagnostic resources, and insufficient healthcare personnel significantly constrained effective TB communication and follow-up. Unlike the previous themes, these challenges reveal that communication barriers are not solely linguistic or cultural but are also shaped by structural conditions within the health system. The Culture-Centered Approach recognizes that health outcomes are influenced by the interaction between culture, agency, and structure. In this context, even when health workers communicated effectively using culturally appropriate language, logistical barriers undermined their efforts by reducing opportunities for diagnosis, treatment monitoring, and community education. These findings suggest that improving TB communication requires not only culturally adapted messaging but also strengthening healthcare infrastructure and service delivery systems in rural communities.

Treatment Compliance

Compliance was framed as a moral obligation: “faithfulness to drugs” (Male participants, 010, 014) was emphasized, yet defaulting remained common. The description of treatment adherence as “faithfulness to drugs” reflects the moral framing of TB treatment in community and healthcare narratives. Rather than presenting compliance solely as a clinical requirement, participants and health workers framed it as a matter of personal responsibility, commitment, and trustworthiness. This finding demonstrates how language can influence health behavior by attaching social and moral meanings to treatment practices. From a discourse analysis perspective, the concept of faithfulness frames successful treatment completion as desirable and virtuous. However, despite these positive framings, treatment default remained common, suggesting that moral discourse alone may be insufficient to overcome the practical and social barriers patients face. This finding indicates the need for interventions that combine motivational communication with structural support, such as improved access to medication, transportation assistance, and ongoing patient follow-up.

Transmission Explanations

Participants explained airborne spread vividly: “when you talk, sing, or cough, the air goes to another person (Male participant, 001, Female participant, 003).” Participants frequently explained TB transmission through vivid descriptions such as “when you talk, sing,

or cough, the air goes to another person.” This finding shows how health workers translated biomedical concepts into simple, relatable language that community members could easily understand. Consistent with the Culture-Centered Approach, these explanations adapted scientific information to local communicative contexts without sacrificing accuracy. The emphasis on everyday activities such as talking, singing, and coughing makes airborne transmission visible and understandable in practical terms. From a health communication perspective, these explanations frame messages effectively by connecting disease transmission to routine social interactions familiar to community members. This approach likely enhances comprehension and promotes preventive behaviors by making abstract scientific concepts more concrete and relevant.

Medical vs. Local Language

Health workers avoided technical terms like “positive result,” instead explaining TB as “bacteria in your body (Male participants, 009 & 012). “The finding that health workers avoided technical phrases such as “*positive result*” and instead explained TB as “*bacteria in your body*” illustrates the strategic adaptation of medical language for community understanding. Health workers recognized that technical terminology could be confusing, intimidating, or misunderstood, particularly in multilingual and culturally diverse settings. This finding strongly supports the Culture-Centered Approach, which argues that health communication is most effective when messages are communicated in ways that are meaningful within local cultural and linguistic contexts. By simplifying biomedical terminology and using familiar language, health workers reduced communication barriers and increased access to health information. The finding also reinforces the principle that successful public health communication depends not only on information accuracy but also on how that information is framed and delivered to the intended audience. Figure 1 shows the conceptual framework highlighting how language, culture, and structural barriers intertwine in shaping TB narratives.

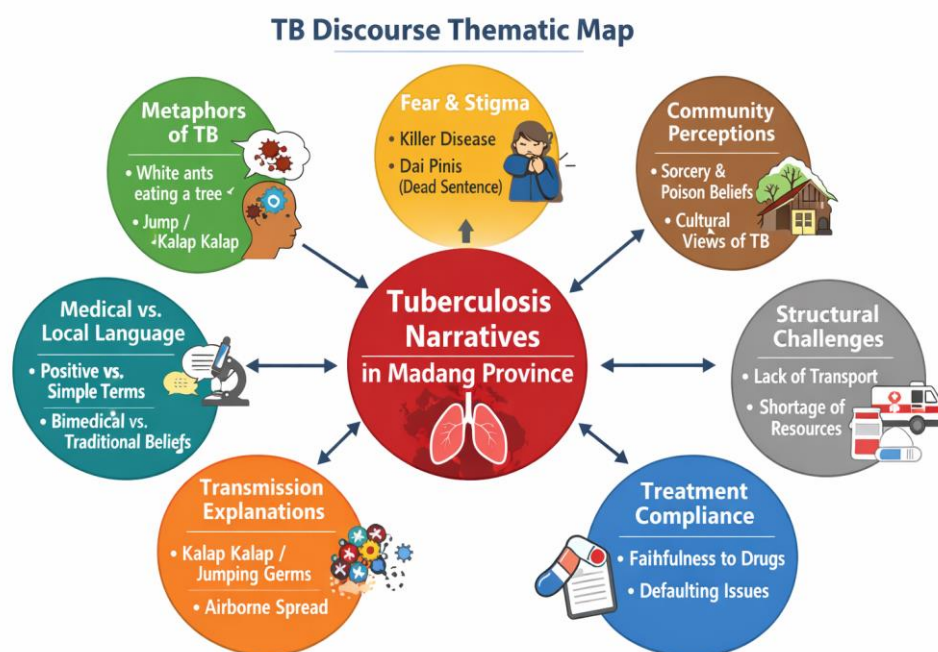


Figure 1 A conceptual framework highlighting how language, culture, and structural barriers intertwine in shaping TB narratives.

DISCUSSION

Summary of the findings

This qualitative discourse analysis sought to understand the language that members of the language community and healthcare providers use to explain and deliver TB care to individuals infected with TB. The findings highlight TB discourse as a discursive ecosystem in which metaphors, stigma, cultural beliefs, and structural barriers intertwine. Language is influential, shaping perceptions of compliance, stigma, and community understanding.^[30] Therefore, selecting language for health messages and TB care must be done carefully, taking into account the diverse ways people explain and interpret TB, transmission, medications, and adherence.^[31] Although individuals, households, and communities share an environment, as qualitative research often shows, social, cultural, economic, and educational factors shape their explanations.^[26]

Metaphors of Tuberculosis

One notable finding is the use of metaphors to explain TB. This suggests that the meanings of TB are socially constructed within specific contexts. Although local communities share the same environment, individuals and households have different explanations and interpretations of TB incidence, transmission, treatment, and medication adherence.^[31] Therefore, using locally understood terms improves understanding of TB and reduces the risk of misunderstanding. The findings can be interpreted through Conceptual Metaphor Theory^[32,33], which posits that people understand abstract or complex phenomena through familiar experiences and culturally grounded concepts. Participants' use of local metaphors to describe tuberculosis suggests that TB is cognitively framed through everyday experiences and

culturally shared knowledge. These metaphors provide a way to communicate disease symptoms, perceived causes, and severity in ways the community readily understands. This implies that health messages and communications to strengthen communities' and individuals' understanding must be tailored with culturally relevant language to enhance understanding of tuberculosis among local communities. This explanation is also supported by the Culture-Centered Approach^[34], which argues that effective health communication must be grounded in communities' cultural contexts, values, and linguistic practices. The use of locally familiar metaphors to explain TB reflects culturally appropriate message framing, thereby enhancing comprehension, relevance, and community engagement. This finding also supports Framing Theory^[35,36], which suggests that how information is presented influences how audiences interpret and understand a message. By framing TB through locally understood metaphors and culturally familiar expressions, community members can more readily comprehend complex health information.

Tuberculosis Discourse as a Discursive Ecosystem

The participants emphasised that TB discourse is a discursive ecosystem in which TB is constructed as both a biomedical and a cultural phenomenon. The findings also support Saunders et al.'s^[37] argument that a comprehensive understanding of TB's social determinants is essential to developing contextually relevant and effective health interventions. From a theoretical perspective, the Social Determinants of Health Theory provides a useful framework for interpreting these results. The theory holds that multiple layers of factors influence health outcomes, including socioeconomic conditions, education, living environments, social relationships, and access to

healthcare services.^[38] In this study, TB discourse reflects the interplay of these levels of influence, showing how structural conditions shape local meanings and responses to the disease. Furthermore, the findings align with the Social Ecological Model.^[39,40] which emphasizes that interconnected influences at the individual, interpersonal, community, organizational, and policy levels shape health behaviors. The coexistence of metaphors, stigma, cultural beliefs, and structural constraints within TB narratives illustrates how these layers interact to influence TB incidence, management, and outcomes. Therefore, improving TB care requires not only biomedical interventions but also strategies that address the broader social and cultural environment in which TB communication occurs. Understanding these interconnected systems is critical for designing culturally responsive health promotion messages, reducing stigma, and strengthening community engagement in TB prevention and treatment.

Implications for Health Policy and Healthcare Services

The findings of this study have important implications for TB control policies and TB care services, including TB Infection Prevention and Control, Directly Observed Treatment Short-course (DOTS), community-based TB programs, and health promotion initiatives. The results highlight the need for health communication strategies that use culturally appropriate and locally accepted terminology to enhance understanding and reduce misconceptions about TB.^[41,42] This supports efforts to tailor TB messages to local contexts and improve their effectiveness. For TB care services, healthcare providers should incorporate locally relevant examples and illustrations when communicating with patients to strengthen treatment adherence. However, metaphors should be used cautiously, as individuals may interpret them differently, potentially leading to misunderstanding, confusion, and unintended barriers to TB prevention and control. Collectively, these findings suggest that culturally responsive communication should become a core component of TB policy, program implementation, and service delivery to improve TB awareness, treatment outcomes, and disease control.

CONCLUSION

TB in Madang Province is addressed not only with drugs and diagnostics but also with words, metaphors, and narratives. Language shapes how TB is understood, feared, and treated. By analyzing discourse, this study underscores that effective TB control requires more than biomedical interventions — it demands culturally grounded communication, structural support, and sensitivity to stigma. This study demonstrates that TB in Madang Province is not only a biomedical condition but also a social narrative shaped by language. Effective TB control requires: culturally grounded communication strategies that use metaphors and local language while avoiding stigmatizing terms, policy support to address structural barriers such as transport and diagnostic

shortages, and stigma-sensitive discourse that frames TB as curable rather than fatalistic. Future research should explore patient narratives, compare discourse across provinces, and test communication interventions.

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REFERENCES

1. World Health Organization. Global tuberculosis report 2025 [Internet]. World Health Organization. Geneva: World Health Organization; 2025. 1–98 p. Available from: http://www.who.int/tb/publications/global_report/en/index.html
2. Diefenbach-Elstob T, Plummer D, Dowi R, Wamagi S, Gula B, Siwaeya K, et al. The social determinants of tuberculosis treatment adherence in a remote Region of Papua New Guinea. *BMC Public Health* [Internet], 2017; 17(1). Available from: <http://dx.doi.org/10.1186/s12889-016-3935-7>
3. Marme G, Kuzma J, Zimmerman PA, Harris N, Rutherford S. Tuberculosis infection prevention and control in rural Papua New Guinea: an evaluation using the infection prevention and control assessment framework. *Antimicrob Resist Infect Control* [Internet], 2023; 12(1): 31. Available from: <https://doi.org/10.1186/s13756-023-01237-9>
4. Aia P, Wangchuk L, Morishita F, Kisomb J, Yasi R, Kal M, et al. Epidemiology of tuberculosis in Papua New Guinea: analysis of case notification and treatment-outcome data, 2008–2016. *West Pacific Surveill response J WPSAR*, 2018; 9(2): 9–19.
5. Aia P, Kal M, Lavu E, John LN, Islam TI. The burden of drug-resistant tuberculosis in Papua New Guinea: results of a large population-based survey. *PLoS One*, 2016; 11(3): 1–9.
6. Bumbu L, Vaccher S, Holmes A, Sodeng K, Graham SM, Lin YD. Drug-resistant TB in Morobe Province, Papua New Guinea, 2012–2021. *Public Heal Action*, 2024; 14(4): 146–51.
7. Marme G, Kuzma J, Harris N, Zimmerman PA, Rutherford S. Investigating socio-ecological factors influencing implementation of tuberculosis infection prevention and control in rural Papua New Guinea. *J Public Health (Bangkok)*, 2023; 1–10.
8. Ben-Arye E, Lopez G, Rassouli M, Ortiz M, Cramer H, Samuels N. Cross-Cultural Patient Counseling and Communication in the Integrative Medicine Setting: Respecting the Patient's Health Belief Model of Care. *Curr Psychiatry Rep* [Internet], 2024; 26(8): 422–34. Available from: <https://doi.org/10.1007/s11920-024-01515-2>
9. Ruth Ese Otaigboria. Cultural models of illness and health communication strategies improving healthcare access and equity for immigrant patients' populations. *GSC Biol Pharm Sci*, 2024; 29(3): 390–410.

10. Fraenkel J, Filer C. Prisoners of a distant past? Linguistic diversity and the time-depth of human settlement in Papua New Guinea. *World Dev*, 2022; 157(June): 1–34.
11. Zachariah R, Harries AD, Srinath S, Ram S, Viney K, Singogo E, et al. Language in tuberculosis services: Can we change to patient-centred terminology and stop the paradigm of blaming the patients? *Int J Tuberc Lung Dis*, 2012; 16(6): 714–7.
12. Gizaw Z, Astale T, Kassie GM. What improves access to primary healthcare services in rural communities? A systematic review. *BMC Prim Care* [Internet], 2022; 23(1): 1–16. Available from: <https://doi.org/10.1186/s12875-022-01919-0>
13. Kassens AL, van der Meulen Rodgers Y. Health and Distance to Healthcare in Papua New Guinea. *New Front Reg Sci Asian Perspect*, 2019; 38: 203–29.
14. Barbosa P, Vieira M, Ramos JP, Duarte R. Unveiling the power of neutral and inclusive language in tuberculosis prevention and care. *Breathe* [Internet], 2023; 19(4). Available from: <http://dx.doi.org/10.1183/20734735.0157-2023>
15. Macgregor AS. Tuberculosis and public health: policy and principles in tuberculosis control. Vol. 2, *International Union Against Tuberculosis and Lung Disease*, 2009. 724–726 p.
16. Phuanukoonnon S. High prevalence of undetected tuberculosis and its link to low utilization of health services and poor health seeking behavior of prolonged cough patients in rural coastal Papua New Guinea: Prior to the global fund program. *People Cult Ocean*, 2018; 34: 101–11.
17. Teibo TKA, Andrade RL de P, Rosa RJ, de Abreu PD, Olayemi OA, Alves YM, et al. Barriers that interfere with access to tuberculosis diagnosis and treatment across countries globally: a systematic review. *ACS Infect Dis*, 2024; 10(8): 2600–14.
18. Abu Bonsra E, Botchway HA, Aboagye P, Twumasi E. Self-reported history of tuberculosis diagnosis, knowledge, and prevention practices among adults in selected regions of Ghana. *Discov public Heal*, 2026; 23(1).
19. Kim-Farley RJ. The languages of public health: avoiding a modern-day “tower of Babel.” *Am J Public Health*, 2024; 114(2): 166–7.
20. Babalola AE, Johnson V, Oromakinde A, Azeez O, Aderinto N, Onasanya O, et al. The role of local languages in effective health service delivery. *Discov public Heal* [Internet], 2025; 22(1). Available from: <https://doi.org/10.1186/s12982-025-00429-5>
21. Mitano F, Sicsú AN, Sousa L de O, da Silva LMC, Palha PF. Discourses of healthcare professionals about health surveillance actions for Tuberculosis control. *Rev da Esc Enferm*, 2017; 51.
22. Breeze R. Critical discourse analysis and its critics. *Pragmatics*, 2011; 21(4): 493–525.
23. Manzoor H, Saeed S, Panhwar AH. Use of discourse analysis in various disciplines. *Int J English Linguist*, 2019; 9(3): 301.
24. Morchid M. A methodological framework for applying critical discourse analysis to textual data. *Int J Res Educ Humanit Commer* [Internet], 2025; 06(06): 77–82. Available from: www.ijrehc.com
25. Fairclough N. Discourse and text: linguistic and intertextual analysis within discourse analysis. *Discourse Soc*. 1992; 3(2): 193–217.
26. DeSanto D, Velen K, Lessells R, Makgopa S, Gumede D, Fielding K, et al. A qualitative exploration into the presence of TB stigmatization across three districts in South Africa. *BMC Public Health*, 2023; 23(1): 1–11.
27. Isaacs A. An overview of qualitative research methodology for public health researchers. *Int J Med Public Heal*, 2014; 4(4): 318.
28. Hall E, Chai W, Albrecht JA. A qualitative phenomenological exploration of teachers’ experience with nutrition education. *Am J Heal Educ*, 2016; 47(3): 136–48.
29. Ahmed SK. The pillars of trustworthiness in qualitative research. *J Med Surgery, Public Heal*, 2024; 2(January): 100051.
30. Courtwright A, Turner AN. Tuberculosis and stigmatization: pathways and interventions. *Public Health Rep*, 2010; 125(SUPPL. 4): 34–42.
31. Mugizi S, Mugyabuso J. Framing mental health through language: metaphors and idioms in everyday communication and media discourse. *Cogent Arts Humanit* [Internet], 2026; 13(1). Available from: <https://doi.org/10.1080/23311983.2026.2726613>
32. Lin Q. Exploration of conceptual metaphor theory in cognitive linguistics. *Clausius Sci Press*, 2024; 7: 80–6.
33. Kramer O. Conceptual metaphor theory as a prompting paradigm for large language models. Germany: Computational Intelligence Group; 2025. p. 1–6.
34. Yang T. Structure – culture – agency : a review of Mohan J. Dutta’ s Culture- Centered Approach Theoretical Foundations : postcolonial critique and subaltern studies. *J Med Humanit Media*, 2026; 4(1): 105–13.
35. Chong D, Druckman JN. Framing theory. *Annu Rev Polit Sci*, 2007;
36. Oyedokun DM. Framing theory: from philosophical roots to practical applications. *J Commun Media Technol*, 2025; 7(1&2): 1–20.
37. Saunders MJ, Montoya R, Quevedo L, Ramos E, Datta S. The social determinants of tuberculosis : a case control study characterising pathways to equitable intervention in Peru. *Infect Dis Poverty*, 2025; 6: 1–15.
38. Hahn R. What is a social determinants of health? Back to basics. *J Public health Res*, 2021; xx: 2324.
39. Tesfay F, Ziersch A, Mwanri L, Javanparast S. Contextual and individual level factors influencing nutritional program effectiveness in HIV care setting in Tigray Region, Northern Ethiopia: Mixed

- methods study. PLoS One [Internet], 2020; 15(4): 1–24. Available from: <http://dx.doi.org/10.1371/journal.pone.0231859>
40. Mdegela M, Madaj B, Vermand N, Mvula CJ, O'Hare JP. Using the socio-ecological model to appraise perspectives on health workforce retention and intention to leave in Malawi and Tanzania: A qualitative longitudinal study. *Rural Remote Health*, 2023; 23(1).
41. Nwagu EN, Abugu LI, Yohanna W, Eze DN, Ononuju AH. Behaviour change communication for control of tuberculosis by healthcare workers in DOTS facilities in Nigeria. *PanAfrican Med J*, 2020; 36(306).
42. Amirah A, Harahap J, Maya D, Siregar S. Communication-based tuberculosis transmission prevention in indigenous communities in South Nias Regency. *J Univers Community Empower Provis*, 2025; 5(3): 126–33.