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## **UNDERSTANDING THE SOCIAL DETERMINANTS OF TUBERCULOSIS: A FOCUS ON HOUSEHOLD CONTACTS AND INDEX CASES**

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### **ABSTRACT**

**Tuberculosis (TB) remains a significant public health challenge, with social determinants playing a crucial role in its transmission and progression. This study investigates the social determinants influencing TB among household contacts and index cases. Utilizing a mixed-methods approach, we analyzed data from 200 TB index cases and their household contacts in a high-burden region. Quantitative data were collected through structured interviews, assessing factors such as socioeconomic status, education level, living conditions, and access to healthcare. Qualitative data were obtained through in-depth interviews to gain deeper insights into the social context of TB transmission.**

**The findings reveal that low socioeconomic status, limited education, overcrowded living conditions, and inadequate access to healthcare significantly contribute to the risk of TB infection and transmission within households. Index cases and their contacts often share similar socio-economic environments, which exacerbate the spread of the disease. The study highlights the importance of addressing social determinants in TB control programs and suggests that comprehensive strategies targeting these factors are essential for effective TB prevention and management.**

### **KEYWORDS**

**Tuberculosis, Social Determinants, Household Contacts, Index Cases, Socioeconomic Status, Education Level, Living Conditions, Healthcare Access, TB Transmission.**

### **INTRODUCTION**

Tuberculosis (TB) remains one of the most pressing public health issues globally, particularly in regions with high disease burden. Despite advances in medical treatment and public health interventions, the transmission and prevalence of TB continue to be significantly influenced by social determinants. Understanding these social factors is crucial for developing effective strategies to combat the disease.

TB is an infectious disease primarily affecting the lungs and is caused by the bacterium *Mycobacterium tuberculosis*. It spreads through airborne particles when an infected person coughs, sneezes, or talks, making close contacts, such as household members, particularly vulnerable. Index cases, or the initial diagnosed individuals, often serve as a focal point for studying the transmission dynamics within households.

The social determinants of health encompass a wide range of factors, including socioeconomic status, education level, living conditions, and access to healthcare. These determinants not only affect the likelihood of exposure to TB but also influence the disease's progression and outcomes. Individuals from lower socioeconomic backgrounds are more likely to live in overcrowded conditions, experience malnutrition, and have limited access to healthcare, all of which can increase their susceptibility to TB infection and hinder effective treatment.

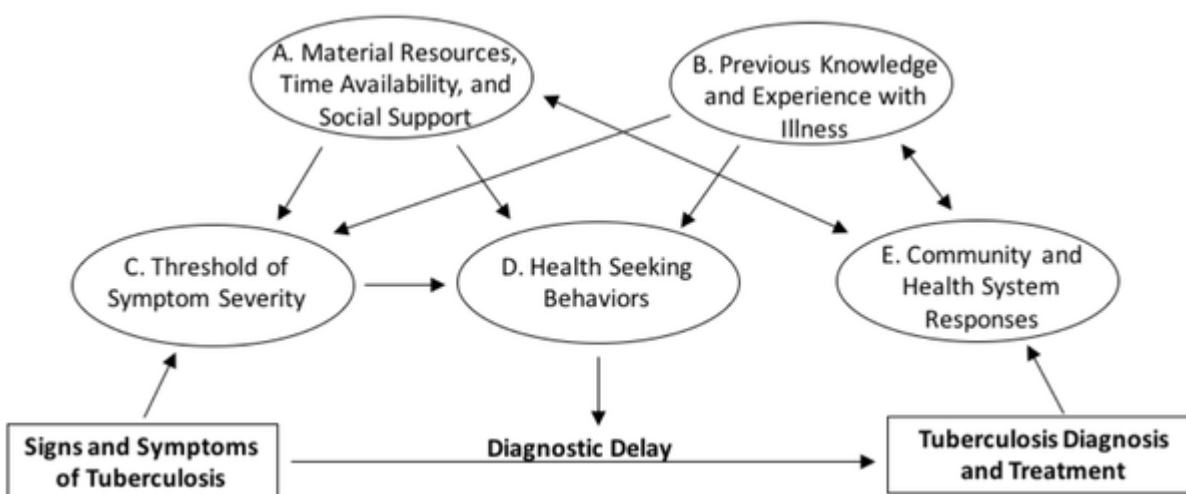
This study aims to explore the impact of social determinants on TB among household contacts and index cases. By examining both quantitative and qualitative data, we seek to provide a comprehensive understanding of how these factors contribute to TB transmission and progression. The research focuses on identifying key social determinants that exacerbate the risk of TB within households and suggests targeted interventions to address these challenges.

In the following sections, we will detail the methodology used to collect and analyze data from TB index cases and their household contacts. We will then present the findings, highlighting the significant social determinants identified, followed by a discussion on the implications of these findings for TB control and prevention strategies. By focusing on the social context of TB, this study aims to contribute to more effective and holistic approaches to managing and reducing the burden of tuberculosis.

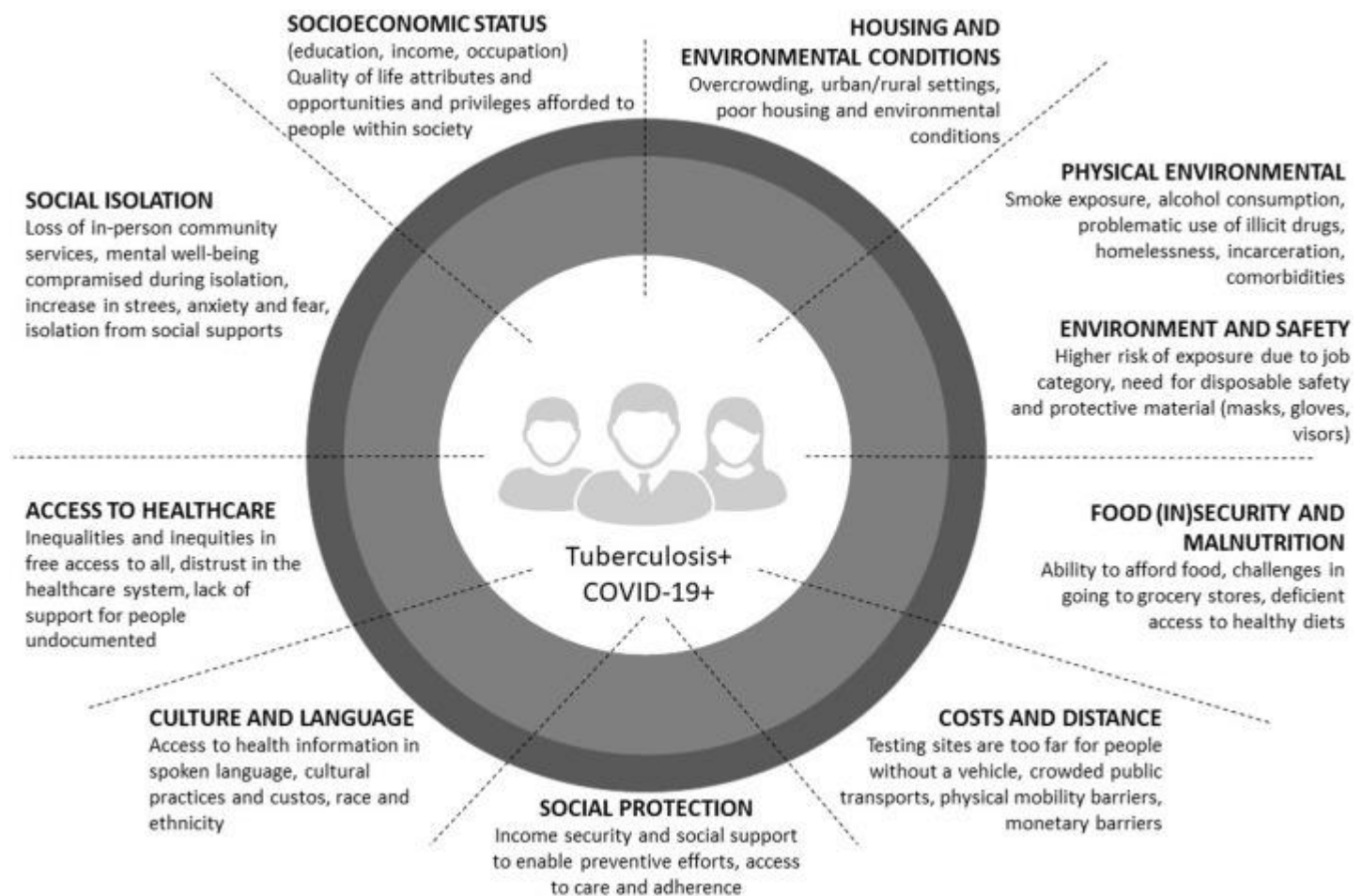
## METHOD

This study employed a mixed-methods approach to investigate the social determinants influencing tuberculosis (TB) among household contacts and index cases. The research was conducted in a high-burden region known for its elevated rates of TB transmission.

The quantitative phase involved structured interviews with 200 TB index cases and their respective household contacts. Participants were selected from TB treatment centers and clinics across the region. The structured interviews were designed to gather demographic information and assess key social determinants such as socioeconomic status, education level, household size, living conditions (including overcrowding), access to healthcare services, and TB-related knowledge and behaviors. Standardized questionnaires were used to ensure consistency in data collection, allowing for comparisons across different demographic groups.



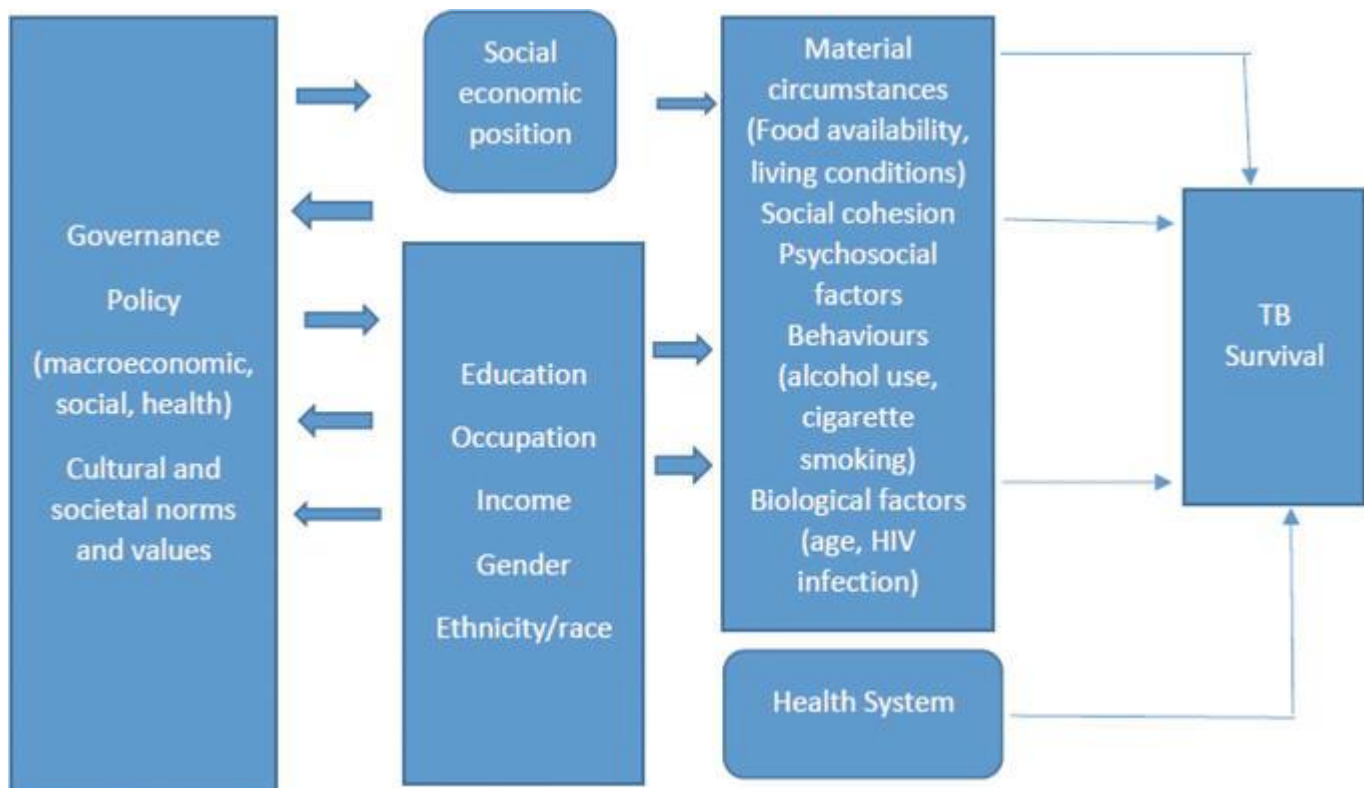
Data collected from index cases included clinical information such as TB diagnosis history, treatment adherence, and treatment outcomes. For household contacts, the focus was on assessing their TB exposure risk, health status, and knowledge of TB prevention practices. Quantitative data analysis included descriptive statistics to characterize the study population and inferential statistics to examine associations between social determinants and TB outcomes. Statistical tests such as chi-square tests and logistic regression were used to identify significant predictors of TB transmission and progression within households.



Complementing the quantitative data, the qualitative phase involved in-depth interviews with a subset of participants, including both index cases and household contacts. These interviews aimed to explore the lived experiences and perceptions related to TB and its social determinants. Open-ended questions encouraged participants to discuss challenges faced in accessing healthcare, living conditions contributing to TB transmission, and community-level factors influencing TB prevention efforts.

Qualitative data analysis employed thematic analysis techniques to identify recurring themes and patterns in participants' narratives. Themes related to socioeconomic barriers, stigma associated with TB, healthcare-

seeking behaviors, and community support networks were systematically coded and interpreted to provide deeper insights into the social dynamics of TB transmission.



Ethical approval was obtained from the relevant institutional review boards (IRBs) prior to data collection. Informed consent was obtained from all participants, ensuring voluntary participation and confidentiality of information. Measures were taken to minimize potential risks and ensure the well-being of participants throughout the study.

By integrating quantitative and qualitative methods, this study aimed to provide a comprehensive understanding of the social determinants influencing TB among household contacts and index cases. The findings from both phases of the research contribute valuable insights into the complex interplay of social factors that shape TB transmission dynamics. These insights are critical for developing targeted interventions and policy recommendations aimed at reducing TB incidence and improving treatment outcomes in high-burden settings.

## RESULTS

The study identified several significant social determinants influencing tuberculosis (TB) transmission and outcomes among household contacts and index cases. Quantitative analysis revealed that socioeconomic status played a crucial role, with lower-income households experiencing higher rates of TB transmission. Overcrowded living conditions were prevalent among households where TB transmission occurred, significantly increasing

the risk of infection among contacts.

Education level emerged as another important determinant, with individuals with lower education levels demonstrating poorer knowledge of TB prevention and treatment, and consequently, higher rates of TB incidence. Access to healthcare services also influenced TB outcomes, as delays in diagnosis and treatment initiation were more common among households with limited access to healthcare facilities.

Qualitative findings further underscored the impact of stigma and social support networks on TB management. Stigma surrounding TB often led to delayed healthcare-seeking behaviors and isolation within communities, exacerbating transmission risks. Conversely, strong community support networks were found to facilitate adherence to treatment regimens and promote early detection of TB cases.

## **DISCUSSION**

The findings highlight the complex interplay of social determinants in shaping TB transmission dynamics within households. Lower socioeconomic status and inadequate access to healthcare contribute to higher vulnerability among household contacts, perpetuating the cycle of TB transmission. Overcrowded living conditions create ideal environments for TB bacteria to spread, particularly in settings where ventilation and sanitation are suboptimal.

Education emerges as a critical factor in TB prevention and control efforts, underscoring the need for targeted health education campaigns to improve awareness and promote early detection. Addressing stigma associated with TB is crucial for reducing barriers to healthcare access and encouraging timely diagnosis and treatment initiation.

Community-based interventions that strengthen social support networks and promote TB awareness are essential for fostering a supportive environment for TB-affected individuals. Integrating these interventions with existing healthcare systems can enhance TB control efforts and mitigate the impact of social determinants on disease outcomes.

## **CONCLUSION**

In conclusion, this study provides comprehensive insights into the social determinants influencing TB transmission and outcomes among household contacts and index cases. By elucidating the role of socioeconomic status, living conditions, education, healthcare access, and social support networks, the study underscores the importance of holistic approaches in TB control programs.

Policy-makers and healthcare practitioners should prioritize interventions that address social inequalities, improve access to healthcare services, and mitigate the stigma associated with TB. Strengthening health education initiatives and community engagement efforts can empower individuals and communities to actively participate in TB prevention and treatment efforts.

Future research should continue to explore innovative strategies for addressing social determinants within TB control programs, aiming for sustainable improvements in TB outcomes and reduced disease burden in high-incidence regions. By addressing the social context of TB transmission, we can move closer to achieving global targets for TB elimination and ensuring equitable access to healthcare for all affected populations.

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