Impact of Behavioral and Clinical Risk Factors on Tuberculosis Treatment Outcomes Over the Last 10 Years: A Patient-Oriented Analysis in One of the Highest TB-Burden Countries

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INTRODUCTION

Tuberculosis (TB) remains a major public health challenge in Brazil, which ranks among the top countries globally in TB incidence and mortality. **Most cases are managed in primary care by Family and Community Physicians**, who also address harmful lifestyle habits like substance use and smoking

METHODOLOGY

This study assessed **the impact of lifestyle and clinical risk factors—alcohol and drug use, smoking, diabetes, and healthcare professional status—on TB treatment** outcomes (cure, abandonment, mortality, and failure). We analyzed 1,040,874 confirmed TB cases reported to Brazil's national system (SINAN) from 2014 to 2024, stratifying outcomes by presence or absence of each factor

RESULTS

Results showed that **patients with behavioral risk factors experienced significantly poorer outcomes.** Alcohol users had a lower cure rate (49.4% vs. 66.2%), higher treatment abandonment (19.8% vs. 10.8%), elevated TB mortality (4.7% vs. 2.3%), and more frequent treatment failure (2.5% vs. 1.6%). Similarly, drug users demonstrated lower cure rates (45.8% vs. 66.2%) and abandonment over twice as high (28.2% vs. 10.8%). Smokers also had worse outcomes across all parameters, including a 15.4% abandonment rate and 3.1% mortality. Diabetic patients had a comparable cure rate to non-diabetics (63.8% vs. 62.7%) but faced more than double the mortality rate (6.3% vs. 2.5%). Conversely, healthcare professionals showed superior outcomes, likely due to earlier detection and better health access, with a 75.1% cure rate, 0.5% mortality, and 0.3% failure rate.

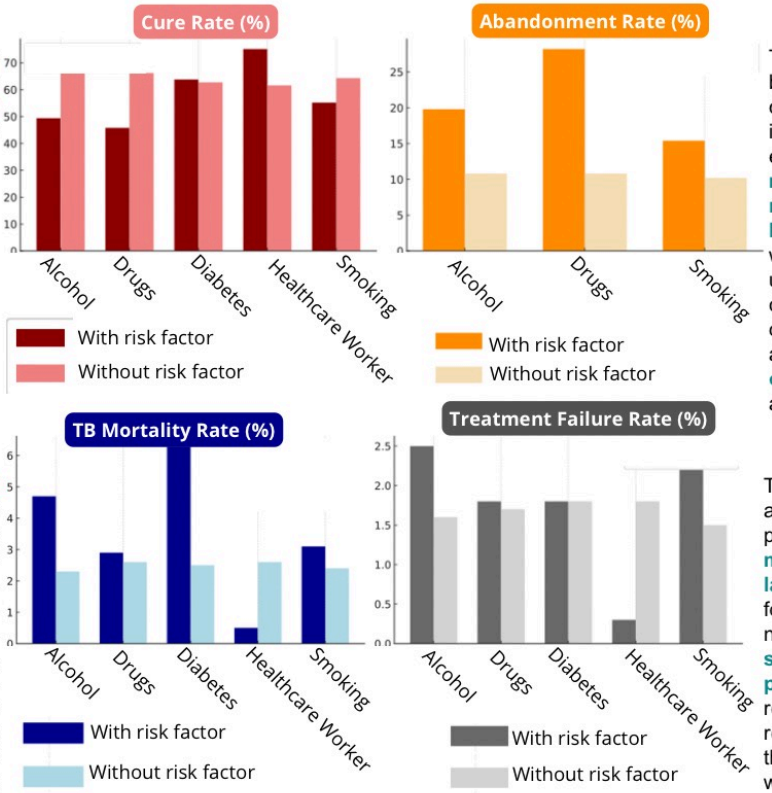

Figure 1: Comparison of Tuberculosis Treatment Outcomes Across Behavioral and Clinical Risk Factors.

DISCUSSION

The results underscore the complex interplay between behavioral, clinical, and occupational factors in determining TB treatment outcomes. Individuals engaged in **substance use** (alcohol, drugs, smoking) consistently exhibited **lower cure rates and higher abandonment, mortality, and treatment failure**—highlighting the **urgent need for integrated support strategies**.

Diabetes, a highly prevalent condition in primary care, was associated with **increased TB-related mortality**, underscoring its relevance as a **prognostic factor.** In contrast, healthcare professionals showed notably better outcomes, likely due to earlier diagnosis and improved access to care. These patterns reveal **critical opportunities to tailor public health interventions** according to **risk profiles**.

CONCLUSION

This study highlights the profound influence of behavioral and comorbid factors on TB treatment outcomes. It presents **novel findings, being the first to integrate multiple lifestyle and clinical determinants using a large national dataset,** and provides actionable insights for **patient-centered care**. The findings emphasize the need for **targeted interventions** such as **integrated substance abuse services**, **smoking cessation programs, and enhanced comorbidity management** to reduce abandonment and improve **cure rates**. Future research should focus on implementing and evaluating these interventions in high-risk populations, particularly within primary care settings, where **Family and Community Physicians are essential agents of change**.