"Healthcare providers’ perspectives on Tuberculosis control in a district of Southern India – Insights from 2022 sub-national TB free certification"

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ABSTRACT

Background: In response to the persistent TB challenge, the National Tuberculosis Elimination Programme (NTEP) of India, formerly known as the Revised National Tuberculosis Control Programme (RNTCP), set a strategic goal to eliminate the nation’s TB burden by 2025, five years ahead of the Sustainable Development Goals. In recognition of this challenge, the Indian Government launched the Sub-national Certification initiative in 2021, fostering competition among states and districts to attain TB-free status and offering recognition and incentives to the best-performing entities. Leveraging verification methods such as TB scores, treatment data, and community-level incidence estimation, this study seeks to provide a comprehensive view of the landscape.

Materials & methods: The study targeted healthcare providers encompassing doctors and chemists employed in both public and private sectors. A non-probability sampling technique, specifically, the convenient sampling method, was utilized. Two Nominal Group Technique (NGT) sessions were conducted. The first NGT comprised 8 healthcare providers, while the second NGT included 10 healthcare providers, while 14 participants were interviewed for KII.

Results: Utilizing the nominal group technique, the following results were derived: approximately 20 % of patients opt for treatment in the private sector, and pharmacies notifying TB cases comprise around 70 % of the cases. Additionally, most participants concurred that there has been a reduction in TB cases over recent years.

Conclusion: Study’s findings shed light on healthcare providers’ perspectives on various facets of TB control, including incidence trends, patient preferences, drug choices, and compliance.

1. Introduction

Tuberculosis (TB) remains a significant global health challenge, affecting millions of individuals each year. In the year 2021, it was estimated that approximately 10.6 million people worldwide were afflicted by TB. Among these, eight nations, including India, Indonesia, China, the Philippines, Pakistan, Nigeria, Bangladesh, and the Democratic Republic of the Congo, accounted for a substantial majority of the global TB burden. India, with a prominent share of 28 %, reported a considerable 75 new smear-positive TB cases per 100,000 individuals annually. The subsequent year, 2022, marked a pivotal moment in TB surveillance efforts, as India observed a historic increase of 13 %, resulting in a staggering 2.42 million TB cases recorded. This remarkable rise translates to an estimated case notification rate of 172 cases per 100,000 individuals.

In response to the persistent TB challenge, the National Tuberculosis Elimination Programme (NTEP) of India, formerly known as the Revised National Tuberculosis Control Programme (RNTCP), set a strategic goal to eliminate the nation’s TB burden by 2025, five years ahead of the Sustainable Development Goals. This commitment to eradicating TB was underscored by rebranding the RNTCP as the NTEP in 2020. The year 2022 witnessed an intensified effort by the NTEP, aligning with the post-pandemic recovery trajectory and guided by the "National Strategic Plan 2017–2025," in pursuit of the ambitious goal of TB eradication.

Central to these efforts were innovative strategies and interventions aimed at improving patient outcomes and community health. With the World Health Organization (WHO) certifying disease elimination on a national level, India, as a diverse nation comprising 28...
States and 8 Union territories, grapples with varied progress in TB incidence reduction on a regional scale.\textsuperscript{4,5} The substantial variation across states necessitates a unique approach to achieve sub-national measurement and elimination targets.\textsuperscript{6} In recognition of this challenge, the Indian Government launched the Sub-national Certification initiative in 2021, fostering competition among states and districts to attain TB-free status and offering recognition and incentives to the best-performing entities.\textsuperscript{5,7}

To comprehensively understand the dynamics of TB notification and its perception among healthcare providers, this study proposes to delve into their perspectives. Utilizing the Nominal Group Technique (NGT) and Key Informant Interviews (KII), this study aims to offer insights into healthcare providers’ views on TB notification as a part of the Sub-national Certification activity.\textsuperscript{8} Notably, despite the increase in notification and the reduction in incidence, there is a need to capture the on-ground reality and ascertain whether the reported improvements align with the healthcare providers’ experiences.\textsuperscript{7} Leveraging verification methods such as TB scores, treatment data, and community-level incidence estimation, this study seeks to provide a comprehensive view of the landscape.\textsuperscript{5}

The study’s expected outcomes will be helpful for policymakers, health authorities, and practitioners in navigating TB control efforts. Insights from NGT and KII methods can refine strategies, bridge gaps between data and perceptions, and align healthcare providers with TB control goals, supporting initiatives like the Sub-national Certification initiative and NTEP’s mission.

2. Methods

2.1. Study setting

The study was conducted in Bengaluru Rural District, situated in the South-Eastern region of Karnataka State, encompassing an area of 22,298 square kilometres. The district’s administrative centre is in Bengaluru, with a population of 990,923 recorded in the 2011 Census. Bengaluru Rural District boasts a high population density of 441 individuals per square kilometre (1140 per square mile). It exhibits a sex ratio of 946 females for every 1000 males, along with a literacy rate of 77.93%.\textsuperscript{5} The healthcare landscape includes a mix of private and public facilities, including taluk general hospitals, community health centres, and urban and rural primary health centres. The district features 39 designated microscopic centres (DMCs), 2 TRUNAAT centres, and 1 CBNAAT centre.

2.2. Study period and design

The study was conducted between January and March 2023, employing a qualitative exploratory design.

2.3. Study population

The study targeted healthcare providers encompassing doctors and chemists employed in both public and private sectors. Chemists were chosen due to their insights into private anti-TB drug sales, potentially shedding light on the actual decline in TB incidence.

2.4. Sampling technique and sample size

A non-probability sampling technique, specifically the convenient sampling method, was utilized. Two Nominal Group Technique (NGT) sessions were conducted. The first NGT comprised 8 healthcare providers, while the second NGT included 10 healthcare providers, while 14 participants were interviewed for KII.

2.5. Data collection methods

Data was collected through the application of the Nominal Group Technique (NGT) and Key Informant Interviews (KII). The prerequisites for conducting these techniques are shown in Box 1.

2.6. Nominal Group Technique

NGT, a structured group discussion, was employed to gather consensus on TB notification perceptions. The process involves participants responding to moderator-posed questions and prioritizing ideas. NGT aimed for 2–3 sessions per district, with 8–10 diverse participants per session.

2.7. Scoring of NGT

NGT is a four-step process, in the first step, each individual in the group silently generated ideas and wrote them down, in the second step, the group members engaged in a round-robin feedback session to concisely record each idea, in the third step, each recorded idea was then discussed to obtain clarification and evaluation, and in the final step, individuals voted privately on the priority of ideas, and the group decision was made based on these ratings. If information obtained shows wide range of variations - activity will be repeated till a saturation point is reached. The group should be a heterogenous group comprising of doctors working in government hospitals, private practitioners and chemists depending upon the operational feasibility. Fig. 1 depicts the entire process of NGT and Fig. 2 represents the flipchart for recording and discussion of estimates. Time duration required for the conduction of 1 NGT was around 60–90 min.

Scoring of the NGT is a two-step process – Range of estimates was calculated and a consensus on absolute value or number of the estimate will be arrived. Group members are requested to prioritize & score the estimates. Score provided was in the range of 3 to 1. Highest score was three & the lowest was one. Scores were tallied to identify the estimates that are rated or ranked highest by the group as a whole. If there were same scores, scores with highest frequency of high score shall be considered for ranking. Each group member will select the three most important estimates from the group list. After the members score their responses in order of priority, the moderator created a tally sheet on the flip chart. The scores were summarized with numbers down the left-hand side of the chart, which correspond to the estimates from the round-robin. Estimates that are most highly rated or ranked by the group was the most favoured group estimate in response to the question posed by the moderator. A consensus on the absolute value or number of the estimates needs to be arrived at. Estimate which had obtained the #1 first rank was taken for the second step. Another round of NGT processes - to arrive at the ‘absolute value or number’ of the estimate. Steps of silent generation, recording of numbers & discussion was repeated. After discussion, moderator allows the participants to vote & rank the scores.

An example of how the scores and ranking was done is depicted in Fig. 3.

In conclusion, this methodology encapsulates the comprehensive approach undertaken to explore healthcare providers’ perspectives on TB notification within the context of the Sub-national Certification initiative.

2.8. Questions in nominal group technique (NGT)

To gather comprehensive insights into the perceptions of healthcare providers regarding TB notification, a structured approach using NGT was employed. The NGT process included the presentation of a set of questions designed to probe various facets of TB notification as shown in Box 2.
2.9. Key Informant Interviews (KII)

Key Informant Interviews were used to gather detailed insights from selected individuals, involving 10–15 participants chosen for their relevance to the study’s focus. The interviews, conducted in a conversational style using structured guides, facilitated open discussions on various topics related to the investigation. The interviewer effectively guided discussions to get thorough responses, often asking informants for more insights, as seen in Box 3.

2.10. Ethics

Ethics approval was secured from the Institutional Ethics Committee (No. 532/L/11/12/Ethics/ESICMC&PGIMSR/Estt. Vol. IV), and participants provided informed consent before their participation.

2.11. Data analysis

During the NGT process, consensus was sought to derive quantitative insights into drug sales and demand, particularly in the private sector within the district. This information was instrumental in calculating patient-months and subsequently determining the TB incidence. For KII data analysis, verbatim transcriptions were translated from Kannada to English, followed by manual line-by-line coding based on quantitative findings and research questions. The generated thematic codes were processed to yield final outputs. During interpretation, survey and qualitative analyses were interwoven to enhance the comprehension and analysis of survey results.
Clinical Epidemiology and Global Health 28 (2024) 101655

3. Results

3.1. Nominal Group Technique

Utilizing the nominal group technique, the following results were derived: approximately 20% of patients opt for treatment in the private sector, and pharmacies notifying TB cases comprise around 70% of the cases. Additionally, most participants concurred that there has been a reduction in TB cases over recent years. Detailed information is outlined in Table 1.

3.2. Key Informant Interviews

Theme 1. TB Incidence

Most participants interviewed during the Key Informant Interviews (KII) shared the perception of a reduction in TB incidence compared to previous years. Some participants highlighted this trend:

A 30-year-old male private practitioner mentioned, “I used to encounter around 10–15 TB cases every two months. However, I have noticed a significant reduction in the number of cases recently. Currently, I receive only one case every two months, which is quite encouraging. It indicates that our efforts to control and prevent the spread of TB are yielding positive results.”

A 32-year-old male physician reported, “TB cases have greatly come down over the years. Earlier, I could see at least 1 to 2 patients per month. I hardly see any patients these days: even to see 1 patient per month is difficult.”

A 35-year-old male practitioner stated, “TB cases have greatly come down over the years. Earlier, I could see at least 1 to 2 patients per month. I hardly see any patients these days: even to see 1 patient per month is difficult.”

A 45-year-old male general practitioner contradicted the overall trend by stating, “TB cases are less probably because of the distribution of cases to various hospitals around.”

Theme 2. Preference for Public or Private Sector

Most participants conveyed that their patients preferred seeking treatment in the public sector due to improved services and convenience. A 32-year-old male physician said, “I have also observed that almost all my patients prefer seeking treatment in the public sector rather than the private sector.”

A 40-year-old male physician added, “I refer 100% of such patients to NTEP because treatment is very good in the public sector and there is discretion also after counselling them.”

However, a 45-year-old private chemist presented a different perspective, noting that despite advisories, 80% of people preferred private hospitals over government ones for TB treatment.

Theme 3. Preference for Public or Private Drugs

Several participants expressed appreciation for the government’s development of anti-TB drugs and indicated a preference for public drugs over private ones. A 40-year-old male general practitioner noted, “The government’s decision to adopt FDCs for TB treatment is a positive development.”

A 55-year-old male ENT surgeon stated, “The government now provides Fixed-Dose Combination (FDC) medications, which is a positive development compared to the past when individual drugs were given in bulk.”

Theme 4. Drug Resistant TB Cases

While only a few participants came across drug-resistant TB cases and some lacked familiarity with treatment guidelines, the majority recognized the government’s diligent surveillance efforts in managing drug-resistant cases.

A 60-year-old male orthopedician said, “In my experience, MDR TB is only around 1%. I refer these patients to government hospitals as I am not well-versed with the treatment guidelines.”

Theme 5. Compliance of Patients to Anti-TB Drugs

Most participants indicated high compliance among TB patients to
The study’s findings from NGT and Key Informant Interviews offer valuable insights into healthcare providers’ perspectives on TB, including incidence, patient treatment preferences, compliance, and case management, with implications for TB control efforts and the broader healthcare landscape.

4. Discussion

4.1. TB incidence and reduction

Most participants in the Key Informant Interviews agreed that there has been a decrease in TB cases recently, with some reporting reductions of up to 40%, which aligns with global TB control efforts, including the success of initiatives like India’s National Tuberculosis Elimination Programme (NTEP). However, a few participants expressed a
different view, citing a rise in TB cases during the COVID-19 pandemic, suggesting complex interactions between disease dynamics, public health responses, and healthcare-seeking behaviors during crises, prompting the need for further investigation and ongoing surveillance to grasp the real trend of TB incidence.²

4.2. Preference for public sector and drugs

Most participants expressed a strong preference for seeking TB treatment in the public sector, emphasizing the importance of accessible and affordable healthcare services, driven by improved services and convenience. Additionally, the adoption of government-provided Fixed-Dose Combination (FDC) medications reflects a positive trend towards simplifying treatment regimens and improving patient adherence, in line with WHO recommendations for patient-centered TB care.²

4.3. Challenges and surveillance of drug-resistant TB cases

The emergence of drug-resistant TB remains a concern, although participants reported encountering such cases relatively infrequently.¹³ Some participants highlighted a lack of familiarity with drug-resistant TB treatment guidelines, underscoring the necessity for ongoing training and education among healthcare providers. Comprehensive surveillance efforts with robust supervision and monitoring are crucial in managing drug-resistant cases to prevent transmission, a sentiment reinforced by participants acknowledging government surveillance efforts.

4.4. Patient compliance and drug supply

The high level of patient compliance reported by many participants indicates the dedication of TB patients to adhere to their treatment regimens.¹¹ This is a positive outcome, as adherence is crucial for successful treatment outcomes and preventing the development of drug resistance. The consistent and reliable supply of TB drugs, both public and private, reported by participants reflects the availability and accessibility of medications for TB patients.¹⁵ Ensuring the uninterrupted supply of these drugs remains pivotal to maintaining successful TB control efforts.

4.5. Suggestions and implications

The suggestions provided offer valuable insights for improving TB control strategies, particularly in addressing loss to follow-up among TB patients, which is crucial for preventing treatment failure and reducing disease transmission. Additionally, raising awareness, sensitizing healthcare professionals, and reducing stigma align with global efforts for TB control, emphasizing the importance of community engagement, health education, and advocacy.

4.6. Limitations and future directions

The study was conducted within a specific district and may not be fully generalizable to other regions. The qualitative nature of the study limits the quantitative representation of participant views. Future research could incorporate larger, diverse samples and mixed methods approaches to enhance the robustness of findings and their applicability to broader contexts.

5. Conclusion

The study highlights positive developments in TB control, including reduced incidence rates, patient adherence to treatment, and a preference for public sector resources. However, challenges like drug resistance and patient loss to follow-up underscore the ongoing need for targeted interventions and emphasize the importance of patient-centered, community-based approaches in achieving global TB elimination goals.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.cejgh.2024.101655.

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