

*Research Article***Documentation of System Response Post TB Notification by Private Sector: A Mix-method Study in Mehsana District, Gujarat**

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**Abstract :** Tuberculosis is a major public health concern in India since decades. With growing private sector management role in TB treatment, effective coordination between public private sector becomes vital for post notification patient management. So, this study aimed to assess the public health system's response to TB notifications from the private sector in Mehsana district, Gujarat. This was an observational cross-sectional study with primary data from field visits and Key informant interviews while secondary data from Nikshay portal entries. The data were evaluated for timeliness and completeness following TB case notification by private sector. Data entry and analysis was done in Microsoft excel. As results total 380 cases notified to public sector, 92% case reported to the government facility within 7 days of reporting. However, among them 65% have received adherence support and 78% have received treatment literacy. Thematic analysis of KII showed key barrier factors like manpower shortage, logistic supply issues and non-cooperative behaviors from private sectors. In conclusion, post notification reporting was good in Mehsana district but gaps remaining in integrated patients support system and treatment adherence support remains question. Intersectoral support strengthening, capacity enhancement of health workers and establishing accountable system is necessary for better outcomes.

**Keywords:** Tuberculosis, TB Notification, Private Sector, Public Health Response, Mehsana, Nikshay.



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**Introduction**

Tuberculosis is a major public health concern in India, contributing 27% of the burden of disease worldwide. [1] Even after so much sustainable efforts under National Tuberculosis Elimination Program (NTEP), India is still facing challenges in early diagnosis, notification, treatment, adherence and comprehensive reporting. [2] A significant underreporting is noted from private sectors where major chunks of the patients diagnosed and treated. [3] This reporting problem causes incomplete or inappropriate data for policy formation and resource allocation.

As stated, fact, private service providers play pivotal role in TB management, yet their integration into NTEP still remains a problem, specially

in Mehsana district. [4] Studies have reported that inadequate reporting system and poor documentation in private sector contribute to delayed notification and delayed patient care. [5] While proper documentation and notification is very pivotal for outcome tracking, treatment adherence and evaluating the program performance and program efficiency. [6] Moreover, very few evidences on private sector notification affecting patients follow up actions, particularly semi-urban and rural settings of Mehsana district, raises concerns about the sustainability of notification and follow-up systems.

Now, mandatory notification under Revised National TB Control Program (RNTCP), yet suboptimal response has been noted due to logistic issues, less awareness and motivation issues. [7] In addition, post notification processes like patients' system integration in continuum care, contact tracing, progress reporting, outcome monitoring etc remains doubtful creating a gap in continue care. [8] Addressing these issues needs a through understanding of private sector engagement and response in TB control.

This study aims to assess the documentation practices and system responses following TB notifications from private healthcare providers in Mehsana district. By analyzing gaps in reporting mechanisms, follow-up procedures, and data integration, the findings will provide insights for strengthening private sector involvement in TB elimination. Enhancing these processes is essential for improving surveillance, optimizing patient care, and achieving India's goal of TB elimination by 2025.

### **Methodology**

The study was conducted to document the public health system's response to post-TB notification and to identify gaps affecting treatment adherence. A mix method approach comprising both quantitative and qualitative methods was used to document the same.

**Study design:** A cross sectional mix method study; **Study period:** Dec 2019 to Mar 2020; **Study area:** Study was conducted in MEHSANA district.

**Sampling frame** –All TB patient notified by private sector in 4 Q 2018 and 1 Q 2019 from NIKSHAY portal.

### **Study sample**

(A) **Inclusion criteria** - It was patient of tuberculosis, notified by private sector. Residence of Mehsana district .

(B) **Exclusion Criteria**-Person not give consent. Person residence out district of Mehsana and out state of Gujarat..

### **Sampling Procedure**

A systematic random sampling method was employed to select participants from a total of 532 registered patients. A sampling frame was first created, and a 10% sample was drawn, resulting in a total of 53 patients. The sampling interval was calculated to be 10. A random starting point between 1 and 10 was selected—specifically, number 6. Based on this, every 10th patient

from the 6<sup>th</sup> position onward was selected for inclusion in the study (i.e., 6<sup>th</sup>, 16<sup>th</sup>, 26<sup>th</sup>, 36<sup>th</sup>, and so forth).

Selected patients were contacted via telephone to confirm their availability and willingness to participate. During these calls, a mutually convenient time and location for the interview were arranged. Up to three attempts were made to reach each selected individual.

To ensure representation from the private sector, an additional 10% of the total sample was selected purposively from among patients receiving care in private healthcare settings.

**Study tool:** (a) Key informant interview-Guide based on thematic analysis of data. Private sector provider (b) Basic questionnaires'-patient

For purpose of the study, the case definitions were given as follows

**Ethical consideration** – Ethical approval was obtained from the Institutional Ethics Committee of IIPHG, Gandhinagar; Additional approval to conduct the study in Mehsana district was provided by the District TB Officer.

Patient`s rights for the participation in the study were safeguarded. Participation in the study was voluntary and they were free to go away at any point of time without giving any reason.

**Informed consent:** All eligible participants were explained about the study and its objectives and the written consent of those who were willing was taken in the participant consent form.

**Confidentiality of participants:** All details were kept by the investigator under strict confidentiality. The participants were assured same .Personal identifiers were removed.

## Results

### Profile of Reported Cases

A total of 380 TB cases were reported from the private sector providers of health in Mehsana district over the study period of January–December 2022. The public health system's response was evaluated for promptness, linkage to treatment, adherence reinforcement, health education. The initial responder rate at district Mehsana, public health system was very prompt with 92.1% of the TB cases notified from the private sector being contacted within 7 days.

**Table 1 .** System Response to TB Notifications from Private Sector (n = 380)

S.No	Indicator	Number of Cases	Percentage (%)
1	Cases contacted within 7 days	350	92.1%
2	Patients provided treatment literacy	296	77.9%
3	Patients linked to DOT center	319	83.9%
4	Patients receiving adherence support	247	65.0%
5	Patients lost to follow-up after initial contact	46	12.1%

A large proportion was successfully referred for care and received treatment literacy (77.9%). Overall, 65.0% received support in adhering to their treatment. Although early contact was established with most patients, 12.1% of patients did not keep with care, suggesting instances of lost continued engagement and support. These results indicate that although an initial connectedness was achieved, further improvement clearly is required in areas such as follow-up and adherence (Table 1)

**Table 2.** Treatment Linkage and Literacy (n = 380)

S.no	Indicator	Number of Cases	Percentage (%)
1	Linked to DOT Center	319	83.9%
2	Received Treatment Literacy	296	77.9%
3	Given Structured Education Materials	158	41.6%

### Timeliness of Initial Response

92.1% of patients had been contacted by the public health team within 7 days of reporting due to real-time alerts on Nikshay . The majority of patients notified from the private sector were effectively integrated into the public TB care system, with 83.9% being linked to a DOT center. Treatment literacy was provided to 77.9% of patients, ensuring a basic understanding of the disease and its management. However, only 41.6% received structured education materials, indicating a shortfall in standardized information dissemination. This gap suggests the need for improved educational outreach to ensure consistent and comprehensive patient knowledge (Table 2)

**Table 3.** Adherence and Follow-Up Support (n = 380)

S.No	Indicator	Number of Cases	Percentage (%)
1	Regular Follow-Up by Health Worker	247	65.0%
2	Received Adherence Counseling	203	53.4%
3	Missed >2 Follow-Up Visits	84	22.1%

Follow-up and adherence-shaping interventions were of modest effectiveness. Regular follow-up by health workers was reported by approximately 65.0% of patients, while adherence counseling was given to 53.4%. But 22.1% of participants missed two or more follow-up visits, suggesting non-persistence to ongoing engagement. They reinforce the necessity of enhanced follow up recommendations, and counseling approaches to improve treatment adherence and outcomes (Table 3). Treatment outcomes among the notified TB patients revealed that 73.2% successfully completed the full course of treatment, indicating a positive impact of the public health system's engagement. However, 12.9% of patients

defaulted during treatment, and 7.6% were either transferred out or became untraceable, reflecting challenges in continuity of care. Additionally, 6.3% of patients experienced a relapse within six months post-treatment, pointing to the need for stronger post-treatment monitoring. These findings emphasize both the successes and persistent gaps in ensuring sustained TB control (Table 4).

**Table 4:** Case Outcomes and Gaps (n = 380)

S.No	Indicator	Number of Cases	Percentage (%)
1	Completed Full Treatment	278	73.2%
2	Defaulted During Treatment	49	12.9%
3	Transferred Out/Untraceable	29	7.6%
4	Relapsed Within 6 Months Post-Treatment	24	6.3%

**Table.5** barriers to notification identified as themes in Key informant interview

Theme	Sub-theme	Representative Quote
Manpower shortage	Insufficient staff or filled posts	"We have 1 TBHV covering 4 blocks, so follow-up is difficult."
Infrastructure issue	Mobility or transport problem	"No government vehicle or fuel allowance is available for routine visits."
Support from private sector	Un cooperative behaviour	"Private doctors often do not guide patients about follow-up with government staff."
Digital problems	Nikshay alert is not adequate	"Nikshay gives alert, but we don't have time to go to each patient's home."

Qualitative analysis identified a number of systematic issues that influenced the completion of follow-ups. Human resource was also limited as few field workers had to cover vast area making follow-up difficult. Infrastructure constraints, including a lack of transport in the form of government vehicles and fuel allowances, also impeded regular contact. Coordination with the private sector was poor, as private practitioners often did not direct patients to continued care in the public system. And digital tools, such as Nikshay, did give alerts to people in the field, although it was often hard for those workers to act on them, having neither the time nor resources to do so properly (Table 5).

## Discussion

The study is of great significance as it offers a thorough initial analysis of the public health system's response to tuberculosis (TB) cases notified from the private sector in Mehsana district, Gujarat. The findings indicate that the

public health system in Mehsana has a strong initial response to TB notifications, with 92.1% of cases contacted within seven days and 83.9% successfully linked to DOT centers. These rates align well with prior research on the subject of the life-saving value of timely care initiation in TB patients as well as on the topic of minimizing treatment initiation delay [9].

However, inadequate patient awareness and poor adherence to long-term treatment are still present. Even though almost the entire group of patients, i.e., 77.9%, received basic information, just 41.6% were provided with specific educational materials, showing that the ways of patient education were not uniform. Despite 73.2% of patients completing treatment, 6.3% experienced relapse within six months, highlighting the fragility of post-treatment follow-up, 12.9% were highly influenced by the fact that linkage and initiation are not sustainable conditions of the vulnerable patient population. The data shared that through interviews some of the barriers were underscored, such as insufficient staff, transportation issues, poor cooperation from the private-public sector, and a lack of capability to act on alerts like the ones from Nikshay. Almost the same barriers were observed in other parts of India. This points to one striking aspect of the situation in that it is the unhindered amalgamation of the private and public sectors, staff allocation as a matter of priority, and being steadfast in support infrastructures that are the countries' needs and directions of the war on the epidemic [3,5].

## Conclusion

To sum up, the fact that the first contact and the start of the treatment are executed efficiently post-TB report is a very good practice. The population hence needs to be educated on this matter thoroughly for the future as well as adherence support in the long run and the coordination of the system at their respective levels. The paper says that bridging the missing links is inevitable for India to reach the End TB target and to ensure fair, persistent TB care across all sectors.

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