

Performance of revised national tuberculosis control program in Bihar: A situational analysis

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ABSTRACT

Background: Monitoring of a program is a continuous assessment of certain key indicators of it through periodic reports. The efficiency of a health program is assessed by comparing its achievements with the expectations. **Methods:** The study was conducted based on the annual TB report of India for the year 2018 in order to monitor (Revised National Tuberculosis Control Program) RNTCP performance in the Bihar State and its various districts. **Results:** Case notification rate of various districts Bihar was far below the national average of 138 per lakh. Considering treatment initiation, the performance of various districts of Bihar were less than national figures (79.0%). In newly diagnosed TB cases, the treatment success rate of Bihar was 73%. This performance was more compared to Uttar Pradesh (66.0%) but less compared to Jharkhand (92.0%), West Bengal (88.0%), and national data (79.5%). Considering human resources, the total human resources in the states of Bihar (61.9%) and Jharkhand (58.3%) were similar. However, in Bihar, there was a vast shortage of ground-level staff [i.e. (senior treatment supervisor) STS, (senior TB lab supervisor) STLS, (public-private mix) PPM Co-ordinator, and (TB health visitor) TBHV)]. **Conclusion:** It was found that Bihar was one of the less performing states in RNTCP with a vast shortage of ground-level staff and low overall treatment success rate compared to its neighboring states. Stringent monitoring and evaluation in every step of the program implementation should be done in order to improve RNTCP performance in Bihar.

Keywords: Annual report, India, program evaluation, tuberculosis

Introduction

India is a TB burdened country with an estimated incidence of approximately twenty-eight lakhs accounting for about one-fourth of the world's TB cases. Thus, it is more of an epidemic in the country.^[1,2] National Tuberculosis Program (NTP) was implemented in 1962, which did not make a measurable impact on the disease situation of TB in the country.^[3] Hence, in 1997, India launched RNTCP intending to cover the entire nation by the end of 2005 and to achieve 70% case detection rate of estimated incidence and 85% cure rate in new sputum

smear-positive cases. Through the years, the program had evolved and changed its strategy from time to time, the recent major change being the shift from intermittent DOTS to daily DOTS in the year 2017. The budgetary allocation for the program had increased over the years from 710 crores in 2012-13 to 1840 crores in 2017-18. Recently India approved the bold and ambitious National Strategic Plan (NSP) 2017-25 which aimed to eliminate TB as a public health problem from the country by the year 2025 (ten years before the global target). It has four key thrust areas: detect, treat, prevent, and build.^[4]

Bihar exemplifies the challenges of India's TB epidemic, given its historically high levels of poverty and poor health outcomes.^[5,6] Bihar's population exceeds 100 million people^[7] (approximately 10% of India's total) with a per-capita annual income of 42242 rupees in 2017-18 (less than half of India's national average).^[8,9] Bihar's public healthcare system registered 62,248 patients for

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TB treatment in 2017,^[4] and an appreciable proportion of them are likely to be drug-resistant.^[10,11] A major challenge in the way of achieving improved outcomes in Bihar is the poor quality of medical care available for the patients, especially in rural areas.^[12] In the public sector, there is a lack of availability of trained providers with absenteeism being a major problem. Absenteeism is reported to be as high as 67% among doctors and 52% among nurses at the primary healthcare level.^[13,14] In rural Bihar, 90% of outpatient health care is provided by the private sector, of which 70% are informal sector providers.^[15] The previous studies conducted among rural patients of Bihar treated for TB using DOTS (Directly Observed Treatment, Short-course) in the public sector had shown high rates of drop-out and symptom persistence, despite completing treatment.^[16] Another study that sampled 371 174 individuals in 30 districts across India shows that nearly half of those with TB who sought care did so in private sector and non-DOTS settings.^[17] For a periodic in-depth evaluation of a health program, large scale multi-centered studies are required, which may not always be feasible in limited-resource settings like Indian Healthcare System. The other option is studies based on already published reports in the area to be evaluated of a program. Annual TB Report published each year by Central TB Division of Ministry of Health and Family Welfare, Government of India, provides useful insights of TB control activities, information on newer initiatives, and policies and guidelines developed in the preceding year of its publication. The last TB annual report was published on 1st March 2018. Thus, it was chosen for the basis of this study. With this background, the current situational analysis was designed to evaluate the performance of RNTCP in Bihar state. The findings of the research will help in the identification of gaps in the implementation of RNTCP in Bihar state and meticulous planning of interventions, especially at the primary care level to fill in the gaps.

Materials and Methods

It was a study based on annual TB report of India for the year 2018^[4] released in March 2018 by Central TB Division, Ministry of Health and Family Welfare, Government of India in which the performance of RNTCP of the Bihar state and its various districts were evaluated in comparison to other states with particular emphasis on its neighboring states (i.e. Jharkhand, Uttar Pradesh, and West Bengal) and national data. RNTCP performance in the Bihar state was evaluated in terms of case notification, treatment initiation, treatment outcome, and human resources. In the present study, the estimated TB incidence rate per lakh population at risk was taken as 75.^[18] In order to estimate new smear-positive TB cases, at first, new TB cases per hundred notified TB cases were calculated followed by calculation of smear-positive new TB cases out of per hundred notified new TB cases.

Results and Discussion

Case notification

Considering the annual case notification rate, Patna district was the highest performing district with an annual total case notification

rate of 324 per lakh. However, a large proportion of these cases were reported from the private sector (290 per lakh) with public sector reporting of 34 per lakh only. In other districts, Saran (108), Bhagalpur (112), and Gaya (100) were the only districts reporting annual total case notification rate of 100 or more in per lakh population at risk, which was far below the national average of 138 per lakh. Notably, in some districts like Patna, Vaishali, and Saharsa, private sector notification rate exceeded public sector notification which was in contrast to the national data, where the private sector reported only 29 cases per lakh out of 138 cases reported per lakh. Of the public sector reported cases, pulmonary TB cases were abundant (85%–99%) while extrapulmonary TB cases were ranged from 1%–17%. Out of the public sector reported cases, 77%–97% were new, while 3%–23% were previously treated. Out of these, 45%–96% were microbiologically confirmed, while 4%–61% were clinically diagnosed. These were under the national average, but wide variation in the various districts of Bihar was observed, which is a matter of concern.^[4] The possible solution could be the engagement of community pharmacists in TB screening and referral activities which may be feasible and impactful too as reported by a study conducted in Patna by Daftary *et al.*^[19] Meanwhile, Vyas *et al.*^[20] reported community-based active case finding as a suitable strategy in case of vulnerable populations to improve notification rate. In the present study except for Patna district, private sector case reporting of other districts of Bihar was very dismal. Thus, there is a need for scaling up of the private sector in the RNTCP Bihar. This is because half of the TB patients in India first seek care in the private sector, which is mostly unregulated and provides substandard care.^[4,21-23] [Figure 1]

Treatment initiation

Considering treatment initiation in Patna district, it was initiated only in 50% of the public sector notified cases. In other districts, treatment initiation rate in public sector notified cases ranged from 62%–94% with Paschim-Champaran (16%), Madhubani (24%), Kishanganj (27%), Buxar (30%), and Vaishali (49%) being the less performing among all. These were far less than the national average of 79.0%.^[4]

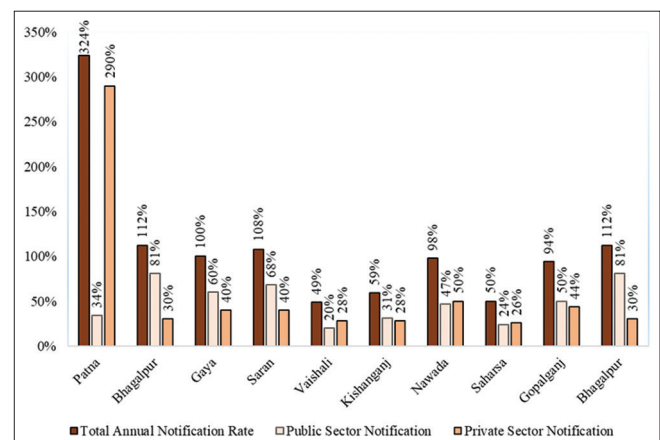


Figure 1: Bar diagram showing annual case notification rate of different districts of Bihar

Treatment outcome

In Bihar, the treatment success rate in newly diagnosed TB cases was 73%. This performance was more compared to Uttar Pradesh (66.0%) but less compared to Jharkhand (92.0%), West Bengal (88.0%), and national data (79.5%). The trend was similar in the case of previously treated patients. Notably, in Bihar, 19.5% of new and 16.5% of previously treated TB cases were not reported which were less compared to Uttar Pradesh (27% and 27%, respectively) but more compared to Jharkhand (3% and 1%, respectively), West Bengal (1.5% and 2.0%, respectively), and national average (6.5% and 8.0%, respectively).^[4] This was supported by the study conducted by Babiarz *et al.*^[16] which reported that 24% of patients discontinued treatment before 25 weeks. In this study, multiple treatment providers, history of previous TB treatment, socioeconomic status, and sex of the patient were predictors of treatment discontinuation. Social stigma may be the other stipulated cause of treatment discontinuation as reported by Vishal *et al.*^[24] in a study conducted in Munger district of Bihar. A study conducted in neighboring West Bengal by Chakrabartty *et al.*^[25] also reported perceived stigma among the patients as a significant predictor for the adherence to DOTS therapy. To address this issue, stigma-reduction strategies through the formation of social support groups to address the misconceptions and myths associated with TB may be helpful, as suggested by Mukerji and Turan^[26] [Figure 2]

Human resources

In Bihar, out of sanctioned 38 district PPM co-ordinator, nobody was in place which in turn was less compared to Jharkhand, Uttar Pradesh, and West Bengal, where 37.5%, 87.6%, and 67.8% were in place, respectively. Considering STS, out of 538 posts sanctioned, only 158 (29.5%) were in place which was less compared to Jharkhand (32.6%), Uttar Pradesh (83.1%), and West Bengal (83.9%). As far as STLS is concerned, Bihar (65.0%) is behind Uttar Pradesh (94.2%) and West Bengal (83.9%) but similar to Jharkhand (63.3%). Considering lab technicians RNTCP contractual, out of 558 sanctioned posts, only 381 (68.2%) were in place which was similar to Jharkhand (66.1%) but less compared to Uttar Pradesh (93.1%) and West Bengal (88.6%). As far as TBHV is concerned, Bihar (15.7%) was behind Uttar Pradesh (90.3%), West Bengal (49.1%), and Jharkhand (62.1%).^[4]

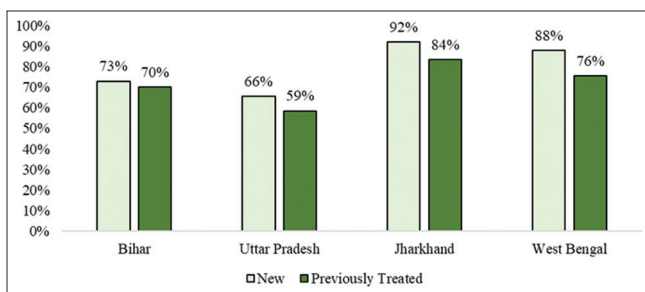


Figure 2: Bar diagram showing treatment success rate (cured and treatment completed) of new and previously treated TB cases notified in 2016 from the public sector of Bihar in comparison to its neighboring states

The overall human resource in place out of sanctioned in RNTCP program in Bihar compared to its neighboring states is depicted in Figure 3.

Overall performance of RNTCP Bihar

Considering case detection rate for new smear-positive TB cases out of estimated, Bihar notified only 63.9% which was far behind the national figure (95.6%) and its neighboring states Jharkhand (89.6%), Uttar Pradesh (102.7%), West Bengal (78.6%) and other states like Himachal Pradesh (167.5%), Gujarat (149.9%), etc., The treatment success rate for new smear-positive TB patients of Bihar was 72.0% which was better compared to neighboring Uttar Pradesh (64.0%), but it was less compared to Jharkhand (92.0%), Rajasthan (90.0%), West Bengal (86.0%), etc., and national average (79.0%).^[4] [Figure 4]

Challenges ahead of RNTCP in Bihar

Although in terms of the overall workforce, Bihar and Jharkhand were found to be similar, there was a vast difference in overall treatment success rate. The reasons for this contrasting figure could be a deficiency in the ground-level human resources (i.e. STS, STLS, PPM Co-ordinator, and TBHV) in Bihar compared to its neighboring states (Jharkhand, Uttar Pradesh, and West Bengal).^[4] These ground-level human resources are vital for program implementation and monitoring. Thus, more ground-level human resources (i.e. STS, STLS, PPM Co-ordinator, and TBHV) should be recruited in RNTCP Bihar in order to improve its various indicators (i.e. case notification, treatment initiation, and completion rate). In RNTCP Bihar, quality assurance mechanisms should be implemented as per protocol in order to deliver quality services (i.e. sputum smear microscopy, drug dispensing mechanism at DOTS center, and follow-up by ground-level workers to improve compliance for treatment of the TB patients). In addition, supportive supervision and periodic evaluation should be done to assure the smooth functioning of the program in the state. Bihar is a resource constraint setting; thus, appointing a new workforce may not always be a feasible option. In that case, intrinsic motivation, nonfinancial incentives, and team-based goals may improve the overall performance of frontline workers (FLWs) as demonstrated by Grant *et al.*^[27] On the other hand, a study conducted in neighboring Jharkhand^[28] reported the importance of advocacy, communication, social mobilization, and active

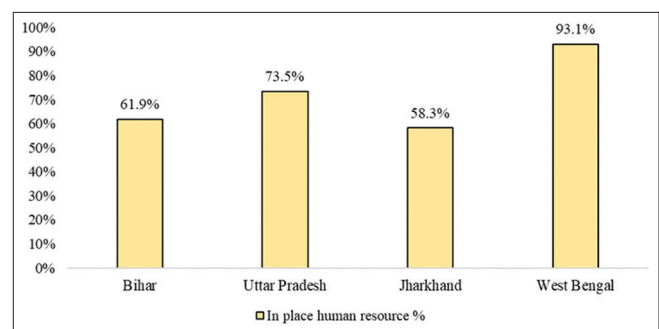


Figure 3: Bar diagram showing in place human resource percentage out of sanctioned of Bihar in comparison to its neighboring states

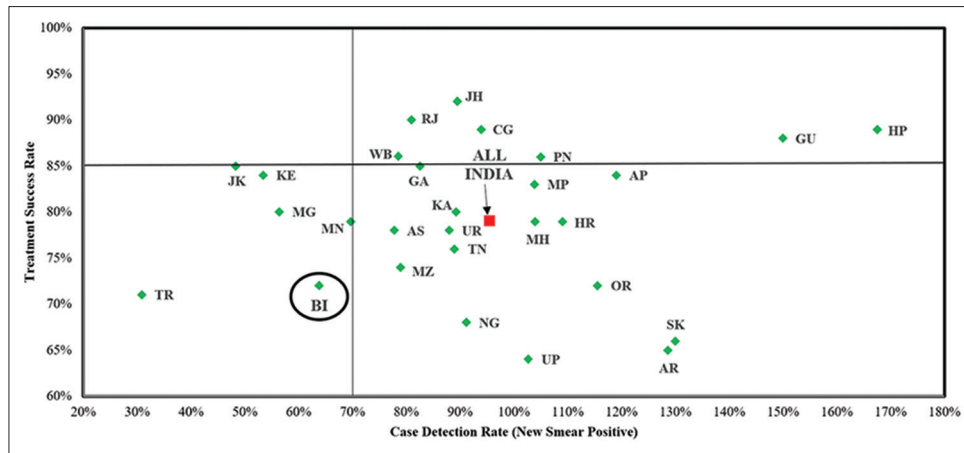


Figure 4: Case detection rate and treatment success rate in RNTCP Bihar in comparison to other states and national level for 2016–2017. AP = Andhra Pradesh, AR = Arunachal Pradesh, AS = Assam, BI = Bihar, CG = Chhattisgarh, GA = Goa, GU = Gujarat, HR = Haryana, HP = Himachal Pradesh, JK = Jammu & Kashmir, JH = Jharkhand, KA = Karnataka, KE = Kerala, MP = Madhya Pradesh, MH = Maharashtra, MN = Manipur, MG = Meghalaya, MZ = Mizoram, NG = Nagaland, OR = Odisha, PN = Punjab, RJ = Rajasthan, SK = Sikkim, TN = Tamil Nadu, TR = Tripura, UP = Uttar Pradesh, UR = Uttarakhand, WB = West Bengal

case finding on Tb notification through the implementation of a project titled “Axshya” in some of its tuberculosis units (TUs). Under “Axshya” project, trained community volunteers named Axshya Mitra’s (friends of Axshya) were deployed on activity-based honorarium to improve case finding and drug adherence in marginalized/vulnerable population residing in selected TUs. This strategy was proved to be effective in the improvement of RNTCP performance in those TUs. Such projects can also be planned and implemented in RNTCP Bihar to improve its performance. Notably, the positive impact of engagement of nonformal health providers on TB case notification rate in marginalized populations was also documented in a study in Odisha by Dutta *et al.*^[29] In RNTCP Bihar, the private sector, in addition to the public sector, would also have to play a substantial role in scaling up its performance. A study by Ananthakrishnan *et al.*^[30] in Chennai demonstrated efficacy of EQUIP (Enhanced Use of Quality Drugs and Utilization of Innovative Diagnostics for TB Management in the Private Sector) in early detection by granting private healthcare providers access to rapid diagnostics (i.e. CBNAAT, cartridge-based nucleic acid amplification test) and appropriate treatment by provision of free, quality anti-TB drugs to them. Such innovations can also be considered for implementation in RNTCP Bihar to improve its functioning and efficiency.

Conclusion

As per the annual TB report 2018, it was seen that Bihar is one of the less performing states in RNTCP with a vast shortage of ground-level staff and low overall treatment success rate compared to its neighboring states. Stringent monitoring and evaluation in every step of the program implementation as per protocol should be done in order to improve RNTCP performance in Bihar.

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Conflicts of interest

There are no conflicts of interest.

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