Original article

IMPACT OF STRATEGIC ADAPTATIONS DUE TO COVID-19 PANDEMIC ON A CAPACITY BUILDING PROGRAM: INSIGHTS FROM A DRTB PROGRAM UNDER NTEP IN INDIA

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ABSTRACT

Introduction: India has experienced high burden of drug resistant tuberculosis, under par treatment success rate and very high loss to follow-up despite continuous efforts to develop evidence-based policy to treat DRTB patients. However, it is challenging to translate policies into practice. The goal of this program was to build capacity of the program staff for effective management of DRTB in public sector through workshops, capacity building exercises, creation and dissemination of information, education and communication materials.

Methodology: The program was implemented in seven states; 11 state-level kick-off trainings were planned to reach 660 National TB Elimination Program staffs. Due to COVID-19 pandemic, on-field activities were replaced with virtual trainings with a set of 4-5 webinars per state. Pre and post training assessments were done to evaluate uptake of knowledge. Number of trainings conducted, staff trained and knowledge improvement were the indicators used to assess the outcome.

Results: A total of 34 webinars were conducted on revised Programmatic Management of Drug-Resistant Tuberculosis guidelines and 3000 staff was trained. The program organized three times more training and five times more staff were trained. Although retention of participants and their attention was challenging, transition to virtual platform provided increased coverage and targeted outputs. Proportion of participants answering correctly in pre/post-training assessments, increased from 47% to 65%.

Conclusion: Use of virtual trainings is an efficient high yielding method to build capacity of NTEP staff. Lessons learnt can help improve such interventions, benefit health programs and the end beneficiaries - the patients.

Key words: DRTB, Capacity building, NTEP, COVID-19, Webinars.

INTRODUCTION

Drug resistance strain of M. tuberculosis is more difficult to treat and is an obstacle to TB care and prevention. In 2019 globally 2,06,030 people with Drug Resistance Tuberculosis (DRTB) were detected[1]. India is one of the top ten countries in the world with a high burden of Tuberculosis and DRTB poses a huge challenge towards achieving the sustainable development goals (SDG) of eliminating TB by 2030 [2-5], as the estimated incidence of DRTB cases in the country is around 1.2 lakhs per year. In view of high burden of Multi Drug Resistant /Rifampicin Resistance Tuberculosis (MDR/RR-TB) with estimated case of 1,30,000 contributing to 27% of the global burden[1] and with a target to eliminate TB by 2025, National Strategic Plans (NSP)[6] have been proposed under the National Tuberculosis Elimination Programme (NTEP).[7] Under NTEP, MDR/RR TB case

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finding and treatment initiation efforts registered remarkable improvement. Out of 66,255 MDR/RR TB cases diagnosed in 2019, 56,569 patients (85%) were put on treatment which is an increase from 71% in 2018.[8] However, treatment of DRTB across the country is in a weak state in terms of low treatment success rate and higher loss to follow up. In this context, it is pertinent to provide trainings to healthcare providers and ensure quality of care both in public and private sectors.

Rationale

Over a period of time, WHO has issued various evidence-based policy recommendations for DRTB care. The "Programmatic Management of Drug-Resistant Tuberculosis (PMDT) in India, 2019" was a detailed roadmap for diagnosis, care and management of DRTB patients in line with the global recommendations that integrates the use of shorter MDR TB regimen and all oral longer MDR TB regimen with new drugs under NTEP with the opportunity to modify regimen based on drug susceptibility test (DST) results.[9] There are also key updates on universal drug susceptibility testing, decentralised DRTB management, diagnostic technology, DRTB diagnostic algorithm and classes of anti-TB drugs recommended for treatment.[10,11] However, in a large country like India, which has a high burden of MDR-TB and extensively drug resistant (XDR) TB, suboptimal treatment outcomes along with a high loss to follow up pose serious challenges. Hence, it is vital to translate the policies into practice at the ground level for reducing the burden of the disease. Furthermore, there exists a prominent knowledge gap and capacity issues at provider level across both the public and private sectors which is a major challenge in the cascade of TB care in the country.

The Central TB Division (CTD) prepared the PMDT guidelines with an aim to provide high quality DRTB care to patients across India. With the roll-out of revised PMDT guidelines 2019, there was a pressing need of appropriate dissemination among key DRTB care cascade in public sector and implementation across India to enhance the clinical and programmatic acumen to diagnose all patients, put them on appropriate treatment and improve treatment outcomes. Inability to do so in a timely and systematic manner could lead to further deterioration in treatment outcomes and increased transmission of the disease. With increase in number of cases each year, it is pertinent therefore, to strengthen the health systems and create efficient human resource by training all health-care workers from physicians to grassroot level workers.[12] To address the emerging need and plug the knowledge gaps, the Union South-East Asia (USEA), in collaboration with Janssen India rolled out a plan to provide momentum to improvement of DRTB quality of care by rapidly percolating the information regarding key changes in PMDT at all levels of the health system.

The NTEP emphasizes on decentralized DRTB treatment services by strengthening of both Nodal DRTB centres (nDRTBC) and District DRTB centres (dDRTBC). While nDRTBCs are responsible for treatment initiation and management of Pre-XDR and XDR-TB patients, the dDRTBCs are responsible for initiation of treatment and management of Rif-Resistant TB Cases. The staffs of dDRTBCs are also crucial for field level follow-up, timely referral of Pre-XDR or XDR patients to nDRTBCs for management of serious adverse drug reactions (ADRs) and for treatment modification. Therefore, such training workshops will be critical as they are not undertaken by State NTEP and are currently not part of the state's training budget. Also, the format of the programme will help in hand-holding and strengthening of dDRTBCs by their respective nodal centres. In this paper, we present a brief account of how specific interventions were planned under the project and its course of implementation in a global pandemic scenario.

Objectives

The project aims to build capacity of public sector health care providers by advancing their knowledge for effective management of TB and DRTB.

METHODOLOGY

Study design

The project was planned to be implemented over a period of six months, from October 2019 to April 2020. In order to sensitize key clinicians and healthcare providers about the recent changes and improve their knowledge of revised PMDT

Guidelines 2019, the project adopted specific interventions as outlined below:

Intervention 1 - Quality improvement and cross-learning sessions/workshops/periodic meetings to disseminate latest PMDT guidelines: A total of 11 two-day long in-person state level kick-off trainings were planned for DRTB Committee members, nodal physicians and Senior Medical Officers (SMO) of all DRTB Centres and, all the state District TB Officers **(Table 1)**.

Table 1: Distribution of kick off meetings under Intervention – 1

State	**No. of State level kick off meetings (one for 20-25 districts)**
Andhra Pradesh	1
Karnataka	1
Punjab	1
Rajasthan	2
Tamil Nadu	1
Uttar Pradesh	3
West Bengal	2
Total	11

The trainings were to be facilitated by national, state PMDT experts, and WHO consultants. Through these meetings, a total of 660 key NTEP staff (60 NTEP staff per training) were targeted to be trained.

Intervention 2 - Creation and dissemination of material and job aid to disseminate latest PMDT guidelines: In order to facilitate dissemination of latest PMDT guidelines and its comprehension, assimilation and application by healthcare providers, it was planned to create job aides such as posters (showing decision trees/diagnosis and treatment algorithms, drug dosages, remedial actions for ADRs etc.), capacity building package comprising of ready reckoners, flyers, flipcharts, and short videos featuring eminent PMDT experts. These IEC materials based on respective core topics of latest PMDT Guidelines 2019, were planned to be extensively demonstrated and used during the various capacity building meetings and workshops organized under Intervention **1 (Table 2).**

Setting

The project was implemented in seven high DRTB burden states of India that account for 47% of the country's population i.e., 655 million, spread across 279 districts. In addition, these states contributed 47 percent of the DRTB case notification in the country in 2018 **(Table 3)**.[13] While majority of these selected states fall in the category of top 10 contributors to high burden in the country, they also show poor programmatic indicators such as low notification rate, low treatment success and high death rate as per recent statistics.[7,8] The sub-optimal DRTB case detection and treatment adherence in these states clearly points out the existing gaps and challenges in the TB care delivery in the country. Capacity building efforts for

Table 2: Details of planned IEC materials

Topic	**Type of IEC materials**	**Target Audience**
DR-TB integrated algorithm	Posters	Medical officers and Healthcare workers
DR-TB treatment regimen and Drug Dosage Table	Posters	Medical officers and Healthcare workers
DR-TB Pre-treatment Evaluation and follow up schedule	Posters	Medical officers and Healthcare workers
DR-TB Management - made simple	A 24-page flip book	Job-aids for healthcare worker training, includes counselling tool
PMDT at a glance	3-fold flyer	Medical officers
Ready Reckoner	A 24-page Booklet with illustrations	Medical Officers
DR-TB burden	1 Infographic flyer	Healthcare workers and private physicians
PMDT Presentation Deck	1 deck of 20 slides	Programme managers and clinicians
Short animation films & videos (3-6 minutes)	9 Videos	Programme managers and Healthcare workers

Table 3: DRTB Burden in the proposed states, 2018							
States	**Population (Lakhs)**	**No. of Districts**	**No. of DRTB centres**	**No. of notified DRTB patients**	**DRTB Notification Rate (No. of DRTB cases/ lac population)**	**No. of patient initiated on Shorter MDR-TB regimen**	**No. of Patient initiated Newer drug containing regimen**
Andhra Pradesh	515	13	13	1753	3.4	1318	148
Karnataka	660	31	31	1502	2.3	1069	68
Tamil Nadu	783	35	33	1529	2.0	1001	82
West Bengal	971	37	35	2700	2.8	1711	110
Uttar Pradesh	2215	75	77	10964	4.9	1032	35
Punjab	297	22	15	762	2.6	350	43
Rajasthan	761	34	35	2879	3.8	386	18

upgrading the knowledge of effective management of TB and DRTB was the need of the hour to ensure systematic strengthening of quality of TB care in the country.

Changes in study design during Covid-19 pandemic

The first case of COVID-19 in India was reported in later half of January 2020.[14] To curb the pandemic and prevent it from spreading further, a nation-wide lockdown was enforced since March 2020. The sudden lockdown posed a serious threat and collapsed the healthcare system of the country. The pandemic brought halt to all field level activities, thus affecting TB care services to a large extent.[15-20] This led to a drop in the TB notification and follow-up rate[8]. In order to tackle this situation, several risk mitigation plans were put in place in order to continue with the TB services to the patients. States quickly came up with standard protocols for TB patients, such as home-delivery of anti-tuberculosis drugs for about two months.[21]

The implementation of this program also encountered a major setback as the planned in-person trainings were put on hold. Keeping the objective of the project i.e., to build capacity of DRTB care providers as a priority, the activities under the planned intervention were re-strategized with certain adaptations in the mode of delivery. The key in-person capacity building activities were revised to virtual trainings and webinars.[22]

In order to compensate for the delay in initiation, the project period was extended by four months, till August 2020. State level kick-off workshops for DRTB committee members, nodal physicians, State TB Officers (STO), and District TB Officers (DTO) were converted into a series of 4-5 webinars for each state; each of the webinars was for the duration of 2-3 hours, facilitated by national and state PMDT experts. The scope of coverage was also broadened to include peripheral health workers as part of the webinars. In order to impart trainings on the latest PMDT Guidelines 2019, a total of nine topics were broadly identified and the intervention states chose two to three topics per webinar, according to their convenience and interest **(Box1)** Training materials were prepared in the form of smart presentations using graphics and animations to capture the attention of the participants. The experts incorporated innovative ideas to successfully facilitate the trainings such as, presentation of unique case studies and field experiences, open house discussions etc. Training materials were shared to all the participants for their future references and post execution of the trainings in their set-up.

Further, knowledge uptake among trained NTEP staff was assessed through pre- and post-training tests. These test sessions incorporated a structured questionnaire prepared by the respective PMDT experts involved in facilitating the particular webinar The questionnaires were administered to the participants ten minutes before the training and again for ten minutes after the completion of the trainings. Case finding approach, patient flow, and case studies based on the new treatment guidelines were some of the topics for which these tests were conducted. After the post-training test was completed, the speakers announced the results of the test and also explained the correct

Box 1: Selected topics for the webinars

1. PMDT Overview and newer initiatives
2. Updates on Case finding approach and Patient Flow
3. Updates on Newer Drugs
4. Updates on Treatment of DRTB
5. Data management on Nikshay and Supervision and Monitoring
6. Operation and programmatic challenges and solutions as per PMDT guidelines
7. Pre-Treatment Evaluation
8. Supply chain management
9. Private Sector Engagement
10. ADR Management, infection control and prevention
11. Case study from the nodal centers on the treatment based on PMDT guidelines
12. Continuity of TB service during lockdown

answers for understanding of the participants. For virtual implementation of the project, various online platforms like Go To Meeting (GTM), Microsoft Teams, and Zoom were evaluated. Comparing the accessibility, ease of use, budget and data security, GTM was preferred as a platform for virtual meetings and webinars. At a later stage Zoom meeting platform was selected for further webinars in order to utilize login registrations for participants and online polling feature for the knowledge assessment. The project team was trained through various demonstration sessions to operate and handle the platform for conducting webinars.

RESULTS

The measurable outcome indicators used for the project were the number of trainings conducted, number of participants who were trained through the webinars, and knowledge uptake among the trained NTEP staff, measured by the change in proportion of participants giving correct answers in the pre and post training tests.

Findings from intervention-1

The results underscored a significant increase in number of webinars conducted and the number of participants was more than that of original target, highlighting enormous success of the strategic adaptations. A total of 34 webinars were successfully conducted in the seven intervention states; these webinars were able to train nearly 3066 key NTEP staff comprised of three main groups, which included 1246 key clinicians viz. DTOs, SMOs, Medical Officers (MO), and other clinicians, 1294 DRTB Coordinators and Supervisors and 526 other DRTB staff including Statistical Assistants (SA), Pharmacists, Lab Technicians, Health Visitors (HV) and Counsellors. The project surpassed its planned targets in terms of completion and coverage; nearly three times more numbers of trainings were conducted and more than five times healthcare providers were trained

Figure-1 presents the participation of three main groups of NTEP staff over a series of five webinars.

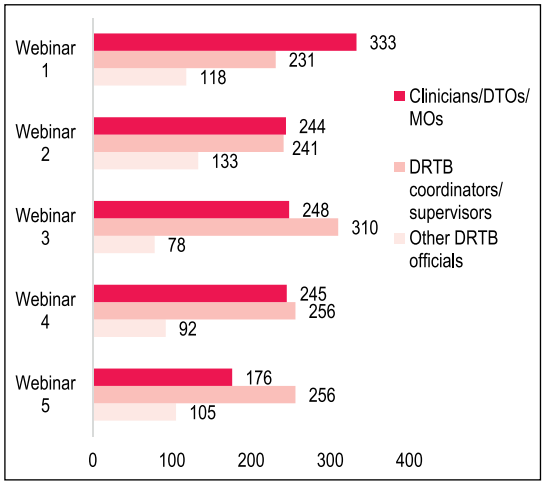

Figure 1: Numbers of key NTEP staff who attended the webinars from all intervention states.

Despite having surpassed the expected participation of healthcare providers, it was observed that the number of participants varied across the webinars and the numbers of NTEP staff in each group were slightly unstable.

Figure 2 depicts participation from seven intervention states. It revealed that participation of DTOs, MOs, Clinicians, and DRTB supervisors/ coordinators was higher than the third group in all the states.

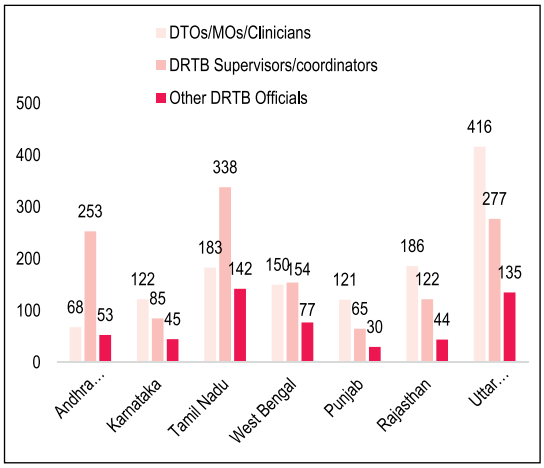

Figure 2: State-wise spectrum of NTEP staff who attended the webinars

In terms of numbers, Uttar Pradesh state registered highest participation (828) followed by Tamil Nadu (663), West Bengal (381), Andhra Pradesh (374), Rajasthan (352), and Punjab (216).

Results from the pre- and post-training tests

This exercise was done for five webinars in the states - Rajasthan, West Bengal, Punjab, Tamil Nadu, and Uttar Pradesh.

Figure-3 presents the overall outcome of the tests; out of the total participants undertaking the test (shown as 'n' in the graph), an average 20 percent increase in the proportion of correct answers in post-test was observed as compared to the pre-tests.

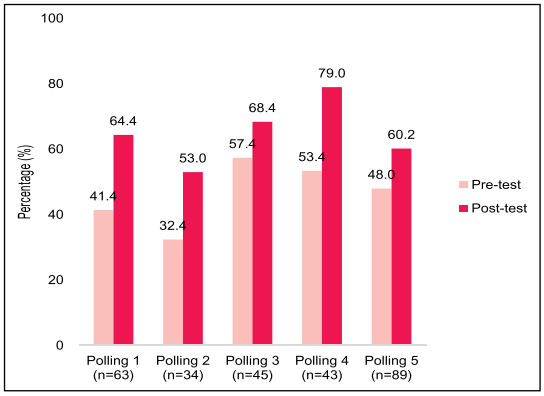

Figure 3: Proportion of participants who gave correct answers during the pre & post-training tests.

Results from intervention-2

As part of these activities IEC materials such as posters, flip book, 3-fold flyer, ready reckoners, presentation deck, and short videos were developed and disseminated among the states. The materials were initially developed in English and translated into six regional languages – Hindi, Punjabi, Bengali, Tamil, Kannada, and Telugu. To ensure effectiveness of the whole activity, feedback was sought from the STOs and other stakeholders on the content of the IEC materials and videos and the contents were modified further to ensure quality. Since the modalities of the project were changed and in-person trainings were not conducted, the IEC materials were shared with respective STOs in each of the intervention states and through the State NTEP Cell, they were widely distributed among Clinicians, Physicians, Program Managers, Medical officers, and Health Care Workers (HCW) at the peripheral level. We ensured successful dissemination through continuous follow-ups with the STOs and acquiring feedback from the recipients. Presentation deck and the videos were shared with the states as e-contents.

DISCUSSION

The COVID-19 pandemic had put massive repercussions in almost every corner of the world, including India, dividing the focus of health care between the pandemic and other important communicable and non-communicable diseases and caused a significant strain of the healthcare resources. However, ensuring quality of healthcare is extremely essential in recent times, to ensure adequate utilization of services and improved outcomes. The pandemic has altogether altered the face of healthcare delivery wherein medical practitioners have increasingly resorted to by adopting digital tools and technologies.[23] Similarly, DRTB which is one of the major health care concerns in India, cannot take a back seat at such a time. In this context, developing knowledge and skills of healthcare workers is also deemed necessary. This project gives an account of how effective risk mitigation plan and efficient strategies are vital to train maximum number of healthcare professionals and deliver the services in best possible way, at the time of global crisis.

The project achieved 100% completion rate and exceeded the planned outcomes in terms of its targeted number of trainings and coverage of participants. Findings of the present project conformed to existing studies and reaffirmed that virtual adaptation of various capacity building sessions can be successful and extremely productive in terms of its reach and finds support from existing research that explain role of web-based teaching technology and learning platforms in medical education. [24] Modern technology and learning platforms can bring together a large number of healthcare professions and facilitate collaborative learning and experience sharing when available resources are limited, face-to-face education is barred due to geographical isolation, especially at a time of national crisis.[25,26] Studies confirmed use of social media platforms to improve public health protection through public awareness.[27]

Few major drawbacks that need to be considered are that, the use of virtual platform does not ensure retention of participants and their interests throughout the span of the webinars. Although several measures were taken to make the webinars more interactive through introducing pre-post training polling sessions, open house discussions with the experts etc., the number of participants was highly unstable during and across the webinars. Another issue was interest of any particular group of NTEP staff in the particular topics being covered; although, virtual platform increased the coverage and key NTEP staff were instructed by the state NTEP cell to attend the trainings, there were chances that they don't derive any usefulness and lose interest over time. Thirdly, it was difficult to ensure full participation in the polling sessions; despite repeated requests, the number of participants undertaking the tests remained low and a challenge for effective assessment of knowledge and skill learnt.

CONCLUSION

Despite the few caveats, the project received wide acceptance and support from the intervention states which gave impetus to increase coverage and ensure success of the interventions. Although, retention of participants and their attention was a practical challenge, mainly because of the unavailability of the key NTEP staffs like clinicians due to their overwork with emergency COVID duties across the geographies and use of technology driven platform, the project was able to achieve its targeted outputs with 100 percent completion rate and beyond. Although ensuring uninterrupted internet availability and zero technical glitches was a challenging task, this strategic innovation was able to capture interests amongst the participants as it ensured attending the trainings programmes from the comfort zone of their environment without risking their safety. An added advantage was that the NTEP field supervisory staff were well-equipped with tablet computers and familiar with use of mobile apps (such as 99 DOTS) for program purposes and thus, the participation from all intervention states was overwhelming.

The success of the project provides a comprehensive understanding of how adaption of virtual platform can be a successful way out to be included as a risk mitigation plan in future capacity building programs. As suggested by other studies, virtual training of healthcare professionals is a viable, efficient, and effective alternative to traditional training programs that will play a vital role in building their competence to improve the healthcare system in post-COVID environment.[28] However, despite the successful completion of the project in terms of the activities, to ensure quality and continuity of knowledge uptake by public sector HCPs, refresher trainings and knowledge assessment of trained NTEP staff at regular intervals are pertinent.

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ETHICAL APPROVAL

The current paper analyses the data from a project which is now completed. The paper does not involve any participants, and only uses project data and processes. Hence, the Ethics Advisory Group of International Union Against Tuberculosis and Lung Disease (The Union) has granted an ethics waiver.

CONFLICT OF INTEREST

None

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