

Evaluation of revised national tuberculosis control program, district Kangra, Himachal Pradesh, India, 2007

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ABSTRACT

Background: The present evaluation study has been conducted with the following objectives: (i) To assess the treatment outcomes of revised national tuberculosis control program (RNTCP) in five microscopic centers of Kangra district under five tuberculosis units and (ii) To identify gaps and underlying contributing factors. Based upon the findings of (i) and (ii) we suggest appropriate measures to narrow down the existing gaps. **Materials and Methods:** We identified and interviewed health personnel involved, reviewed the documents and records pertaining to evaluation plan/guidelines, training records and reports generated by five tuberculosis units. We assessed the inputs, processes and outputs of the program across five tuberculosis units. We calculated the proportion of staff of various categories trained and internal quality control (case detection); availability of drugs, directly observed treatment short course (DOTS) providers, and supervision (case management) and information, education and communication (IEC), and funds distribution. (logic model). **Result:** Around 60%-88% of staffs of various categories trained with overall 25% gap of supervisory visits. In tuberculosis unit (TU) Nurpur, the discordant slides while cross-checking were 8% and 25%. The total proportions of sputum positivity are 5.1%; the highest in Kangra, i.e., 2.3% (national norms of 10-15%). There was no full cross-checking of the positive slides despite internal quality in place. Increased numbers of the extra pulmonary tuberculosis cases (EPTB) are present in all TUs, as high as 61% in TU Dharamshala (Normal range 15%-20%). A gap of 20% DOT center exists-the least in (58%) in TU Nurpur. The awareness level in the TU Dehra is minimum (51%); more so in females and rural set up. **Conclusion:** RNTCP has successfully achieved all its targets in all the five TUs of Kangra District as per national norms despite several gaps. We recommend (i) filling of vacancies of medics and paramedics with reorientation trainings/refresher courses; (ii) conduction of supportive supervision by the seniors; (iii) investigation of cause of increased number of the extra pulmonary cases, and (iv) need of aggressive IEC activities.

KEY WORDS: Extra pulmonary tuberculosis, Kangra, RNTCP, tuberculosis unit

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INTRODUCTION

Tuberculosis is as old as mankind and is mentioned in Vedas and Ayurvedic Samhitas. *Caries* spine has been found in Egyptian mummies in 3500 B.C. Robert Koch demonstrated that it was caused by the bacillus, called as

Mycobacterium tuberculosis (Koch' bacillus).^[1] The World Health Organization (WHO) has identified 22 high-burden Tuberculosis countries which collectively contribute 80 percent of the global burden of tuberculosis (TB). Tuberculosis is responsible for 5% of all deaths worldwide and 9.6% of adult deaths in the 15–59-year old-economic productive age groups.^[2] Tuberculosis kills more women worldwide than all causes of maternal mortality. The case fatality rate of tuberculosis is high; approximately 50% of untreated cases die of the disease. One out of every three HIV/AIDS patients has TB. The latest WHO report on the global status of Multi-Drug Resistant Tuberculosis (MDR-TB) lists Henan Province, China as a “hot spot” for its high number of MDR-TB cases’. Around 5.3% of new TB cases in China are multi-drug resistant.

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Asia carries the largest number of TB cases worldwide. Out of the 22 high-burden TB countries reported by the WHO, 10 are in Asia.^[3] Three-fourths of TB patients in Asia develop active TB during their most productive years between the ages of 15 and 54 years old. India has the largest number of TB cases in the world, accounting for nearly one-fifth of the global burden.^[4] In Himachal Pradesh, tuberculosis is quite wide spread in the poor socio-economic classes and the slum areas where women are the most sufferers. In the state, it occupies the seventh place (3.61%) in the women from the top 10 leading causes of the diseases^[5] while in district Kangra; it is numbered on third place as 3%. So, it is one of the diseases of the public health importance in the district which needs to be studied in detail and evaluated all-round.^[6] The key of this strategy is to cure TB through Directly Observed Treatment at a time and place convenient to the patient.^[7] Case finding is passive detection by means of a patient-friendly and clinically efficient service based primarily on smear microscopy. The present evaluation study has been conducted with the following objectives: (1) to assess the treatment outcomes of RNTCP in five microscopic centers of Kangra district under five tuberculosis units and (2) to identify gaps and underlying contributing factors. Based upon the findings of 1 and 2, we suggest appropriate measures to narrow down the existing gaps.

MATERIALS AND METHODS

Engaging all stake holders

All the stakeholders were first identified and their opinion, suggestions and consensus were obtained for this evaluation of RNTCP project through personal meetings and group discussions; with the chief medical officer, district tuberculosis officer, medical officer tuberculosis and medical officer and senior treatment supervisor/senior treatment laboratory supervisor. Through personal visits and group discussion details of the evaluation project was shared such as: (1) evaluation objective, (2) evaluation issues under assessment, (3) methodology to be adopted for the evaluation, (4) data collection methods, (5) data analysis, and (6) dissemination of results.

In-depth interviews using semi-structured questionnaires were developed for different health officials such as Chief Medical Officer (CMO), District Tuberculosis Officer (DTO), Medical Officer Tuberculosis Center (MOTC), Senior Treatment Supervisor (STS), Senior Treatment Laboratory Supervisor (STLS), laboratory technician at the MC, and DOTS provider at the DOT center. We interviewed them during the study. We discussed the different parameters/indicators of the RNTCP program with all the stake holders and also about the selection of the tuberculosis units and microscopic units.

Description of the RNTCP Program

Review of the documents

We reviewed the following documents on Tuberculosis:

India RNTCP status report prepared by the Government of India, Directorate General of Health Services, Ministry of Health and Family Welfare, New Delhi. Tuberculosis India RNTCP performance report 2006; Operational Manual for District Tuberculosis Units; Operational Manual for Medical Officers tuberculosis; Operational Manual for STLS/STS; Reporting formats for DTC/TU (New case detection, sputum conversion, cure rate and personal medical records information (PMRI) peripheral health institution (PHI) report forms.

Evaluation of the program

Study Area: – District Kangra

The total population covered under RNTCP in the year 2001 was 13 38 536 (census 2001) The population has been divided in five tuberculosis units and 28 microscopic centers plus one microscopic centre conducted by Tibetan Delek hospital, Dharamshala-supervised by five STS (Senior Treatment Supervisor) and five STLS (Senior Tuberculosis Laboratory Supervisor). Five microscopic centers were selected for evaluation of the DOTS program. (1) DTC, Dharamshala, (2) Designated Microscopic Center (DMC) Kangra, (3) Designated Microscopic centre Dehra, (4) Designated Microscopic Centre), Nurpur, and (5) Designated Microscopic Centre, Palampur under the Tuberculosis Unit Dharamshala, Kangra, Dehra, Nurpur and Palampur, respectively.^[8]

One microscopic centre was chosen from each of the five tuberculosis units at random for the study viz., Dharamshala, Kangra, Dehra, Nurpur and Palampur of Kangra district, Himachal Pradesh. Ten cases from each microscopic centre of corresponding TU were selected from second quarter to fourth quarter 2006 by lot method. In all 50 new slides positive patients were selected under the DOTS programme. These TUs were selected for study just because they are performing satisfactorily.

Data sources

Data sources were primary data collection and the secondary data available from the records.

Data collection techniques and tools

Quantitative methods

Review of registers and records (Tuberculosis register, laboratory register, treatment cards) and Logic model for evaluation carrying three parts: *Case detection, Case management and Information, Education and Communication (IEC)* under RNTCP.

Qualitative method

In depth interview using semi-structured questionnaires to District Tuberculosis Officer, Medical Officer Tuberculosis Center, Senior Treatment Supervisor, Senior Treatment Laboratory Supervisor, Laboratory technician at the DMC, and DOTS provider at the DOT center. They were interviewed during the study.

Data analysis

Data generated were analyzed by use of computer using Epi info and Excel.

RESULTS**Evaluation of RNTCP**

The findings of study are briefly listed. We took one microscopic centre each at random, from five tuberculosis units for evaluation, the results of which are shown in the following logic model [Tables 1-3]. Under *case detection evaluation*, in all five TUs/DMCs, proportions of the trained medical officers are 88% with a gap of 12% excepting the medical officers TC (60%) with a further gap of 40%;

laboratory technicians—80% with a gap of 20% and 10% gap of health workers. It has superimposed 25% gap of supervisory visits. Around 70% training sessions have been conducted. The laboratory equipments and reagents are in plenty supply in all TUs. The poor performing Tuberculosis Unit Nurpur has the discordant slides while cross checking as 8% and 25%. The total proportions of sputum positivity are 5.1%; the highest in Kangra—2.3%. There was no full cross-checking of the positive slides despite internal quality in place. Increased numbers of the extra pulmonary cases are present in all TUs, as high as 61% in TU Dharamshala (normal range 15–20%). Under *case management evaluation*, despite all five STS fully trained in TUs, abundance buffer stocks of the drugs and

Table 1: Logic model for evaluation of Revised national tuberculosis control program (RNTCP), District Kangra, Himachal Pradesh, India, 2006. (case detection)

| Levels of the logic model | Indicators | Data needed for the indicator | Source of data | Evaluation design | No. of TUs evaluated | Data collection techniques | Tools |
|--|---|---|--------------------------------------|--|----------------------|--|-----------------------------|
| Input | | | | | | | |
| Trained medical officers | Proportion of the medical officers attending DOTS training (88%) | No. of medical officers attending DOTS training=194 Total no. of the medical officers = 220 | District training Records | Review of the records | DTC, 5 TUs | Interview of DTO | Training register |
| Trained lab. Technicians | Proportion of the lab. Technician attending DOTS training (80%) | No. of the lab. Technician attending DOTS training=35 Total no. of the lab. Technicians=44 | District training Records | Review of the records | DTC, 5 TUs | Interview of DTO | Training register |
| Trained health care workers | Proportion of the health care workers attending DOTS training (89%) | No. of the health care workers attending DOTS training=653 Total no. of the health workers=727 | Block/district training records | Review of the records | DTC, 5 TUs | Interview of DTO | Training register |
| Laboratory reagents/equipments | No. of the microscopic centres equipped with reagents, slides and microscopes (96%) | No. of the microscopic lab. having the facility for the microscope and reagents=28 Total no. of microscopic centres=29 | District stock registers/ records | Review of the stock registers. | DTC, 5 TUs | Interview of DTO, district health educator | Training register |
| Internal Quality Control. | No. of supervisory visits for internal quality control (75%) | No. of the supervisory visits conducted = 72 No. of the visits planned = 95 | District tuberculosis office records | Review of the records | DTC, 5 TUs | Interview of DTO, MO TC | Tour diary. |
| Process | | | | | | | |
| Trainings | No. of the trainings (70%) | No. of the trainings conducted = 7 Total no. of the trainings planned = 10 | District tuberculosis office records | Review of the records | DTC | Interview of DTO, | Training register |
| Sputum collection and examination | Proportion of the suspected slides referred to the microscopy (1.53%) | No. of the slides referred to the microscopy=2158 Total no. of the suspected slides = 140304 | Health care facility OPD register | Review of the OPD Registers. | DTC, 5 TUs | Interview of DTO, MO TC | OPD and laboratory register |
| Cross-checking of slides | Proportion of the slides cross-checked (20%) | No. of the slides cross-checked = 1627 Total no. of collected slides = 8051 | Tuberculosis unit | Review of the records | DTC, 5 TUs | Laboratory technician | Laboratory register |
| Output | | | | | | | |
| Cases identified for sputum positivity | Proportion of the cases detected for sputum positivity (5.1%) | No. of the cases detected sputum positive = 443 Total no. of the cases referred for the sputum microscopy = 8586 | Microscopic centre | Review of the DTC, 5 TUs lab. Register of the microscopic centre | DTC, 5 TUs | Laboratory technician | Laboratory register |
| Reduction in transmission | Reduction in the morbidity and mortality (5.8%) | No. of deaths due to Tuberculosis = 11 Total no. of tuberculosis cases = 189 | District records | Review of the DTC, 5 TUs records | DTC, 5 TUs | Interview of DTO, MO TC | OPD and laboratory register |

Table 2: Logic model for evaluation of revised national tuberculosis program, Kangra, Himachal Pradesh, India, 2006 (case management)

| Levels of the logic model | Indicators | Data needed for the indicator | Source of data | Evaluation design | No of TUs/MCs evaluated | Data collection techniques | Tools |
|---|---|--|--|---|-------------------------|----------------------------|---|
| Input | | | | | | | |
| Drugs | Drugs available as per requirement (100%) | Drugs available = 2510 boxes Drugs required = 2505 boxes | Health care facility records/district records | Review of the records | DTC, 5 TUs | Interview of STS | Stock register |
| DOTS providers | No. of DOTS providers in position (79%) | No. of DOTS providers in position=358 Total no. of DOTS providers sanctioned=451 | District tuberculosis office records | Review of the records | DTC, 5 TUs | Interview of DTO, STS | Staff position record |
| Senior treatment supervisors | No. of the senior treatment supervisor in position (100%) | No. of the STS in position = 5 No. of the STS sanctioned = 5 | District tuberculosis office records | Review of the records | DTC, 5 TUs | Interview of DTO | District tuberculosis centre record |
| Treatment cards | No. of the treatment cards available (109%) | No. of the treatment cards available = 600 Treatment cards required = 550 | Health care facility records | Review of the records | DTC, 5 TUs | Interview of DTO, STS | District tuberculosis centre record |
| Process | | | | | | | |
| Supervised treatment | Proportion of the cases receiving the supervised treatment (96%) | No. of the patients receiving the supervised treatment = 211 Total no. of the patients put on the treatment = 220 | Health care facility records/ Interview of the patients | Review of the records/ interview of the patients | DTC, 5 TUs | Interview of STS, Patient | Patient treatment record, Dots provider |
| Supportive supervision | No. of the supervisory visits (75%) | No. of the supervisory visits undertaken = 72 Total no. of the visits planned = 95 | District tuberculosis office records | Review of the records | DTC, 5 TUs | Interview of DTO, MOTC | Tour dairy |
| | Number of the supervisory visits (75%) | Number of the supportive supervisory visits conducted = 10 Number of the supportive supervisory visits planned = 12 | District records | Review of the records | DTC, 5 TUs | Interview of STS | Treatment register |
| Output | | | | | | | |
| The patients successfully completing the treatment. | Proportion of the cases successfully completing the treatment (89%) | No. of the patients successfully completing the treatment = 168 Total no. of the patients put on treatment = 189 | District records | Review of the records | DTC, 5 TUs | Interview of STS | Treatment register |
| Outcome/impact The patients cured | Proportion of the cured cases among the NSP cases (88%) | No. of the cured cases = 167 Total no. of the NSP cases = 189 | District records | Review of the records | DTC, 5 TUs | Interview of STS | Treatment register |

cards, a gap of 20% DOT centre exists--the least in (58%) in TU Nurpur. Around 96% of supervised treatment with median of 66% of supervisory visits has been conducted. Cure rate ranges in between 81% and 90% with the sputum conversion rate at the 3rd month in between 91% and 97%. Under *IEC management evaluation*, sufficient IEC materials and funds of Rs. 108 000/ for five TUs have been distributed. The awareness level in the TU Palampur is the highest (76%); more so in males and urban set up while that of TU Dehra it is minimum (51%); more so in females and rural set up.

DISCUSSION

This study was conducted for the evaluation of RNTCP in district Kangra from 2nd to 4th quarter, 2006. Its evaluation was based upon the quantitative logic model which consisted of three parts; *Case detection, Case management and IEC model*.

In the case detection evaluation, *in the input indicator*, in all five TUs 60% to 88% trained staffs of various categories; MO TC, medical officers, laboratory technicians and health care workers with overall gap ranging as low as 12% to as high as 60%. Shortage of the equipments, faulty microscopes and lack of the Continuation of Medical Education (CME) among the staff are the factors responsible for reduced number of the collection and examination of the slides, especially, in TU Palampur (0.88%). Overall on average, the supervisory visits done by the different officials in the given five TUs are 75%—a gap of 25% exists which needs to be bridged up either by new recruitment of the staff or stepped up facilitative supervision by the senior supervisors. *In the process indicator*, out of 10 planned sessions of trainings only seven (70%) have been done—a gap of 30% while the proportions of the suspected slides referred to the microscopy are 1.53% which is less as compared to the normal of 2%–3% of the program. The overall proportion of the slides cross checked is

Table 3: Logic model for evaluation of Revised National Tuberculosis Program, Kangra, Himachal Pradesh, India, 2006 (IEC)

| Levels of the logic model | Indicators | Data needed for the indicator | Source of data | Evaluation design | No. of TUs evaluated | Data collection techniques | Tools |
|---------------------------|--|--|-------------------------------------|--|----------------------|-----------------------------------|-------------------------|
| Input | IEC materials, viz., banners, posters, pamphlets etc | No. of the health facilities having the Information, Education and Communication materials. (100%) | District records | Review of records | DTC, 5 TUs | Interview of DTO, Health educator | |
| | Proportion of tuberculosis funds allocated for IEC activities (100%) | Total no. of the health facilities = 101 Fund allocated for IEC (108 000) Total funds (Rs. 108 000) | District records | Review of records | DTC, 5 TUs | Interview of DTO, MO TC. | Cash register |
| Process | Display of the IEC materials | No. of the health facilities displaying the IEC materials = 101 Total no. of the health facilities = 101 | Health facility/ District record | Review of records | DTC, 5 TUs | Interview of DTO, MOTC | Survey of the TUs, MCs. |
| | Proportion of the health facilities utilizing the funds for IEC (100%) | Number of the health facilities utilizing the funds for IEC = 101 Total number of health facilities = 101 | Health facility/ District record | Health facilities survey/Review of the records | DTC, 5 TUs | Interview of DTO | |
| Output | Awareness about the symptoms and treatment of the tuberculosis. | Proportion of the population who knows they should seek attention for a cough longer than 3 weeks and its treatment (61%) No. of the persons who know they should seek attention for a cough longer than 3 weeks and its treatment = 153 Population surveyed = 250 | Community | Randomly select one TU, and select one village | 5 TUs | Interview villagers | Village people |

20% which is above the normal figure of 10%–15% but only in TU Nurpur the discordant slides were 8% and 25%. The laboratory technician has been found to be deficient in doing his technical work as reported by STLS and secondly, the MO TC had the dual responsibility of attending outdoor patients during day hours and also night emergency duty. He was also concurrently working as a part time MO TC, with the result the programme suffered. There were chronic shortages of staff of various cadres due to political interference in the shape of frequent transfers and deputations.

In the output indicator, The total proportions of sputum positivity are 5.1% as against the national norms of 10%–15%. Despite the internal quality control in place, there is no full cross checking of the positive slides and 10%–20% of the negative slides by the STLS in any of the TUs of the district, especially in TU Nurpur. The reason for the same was the late posting of the STLS and a part time working MO TC. There is no external quality control by the accredited laboratory of the other states. The highest positivity rate of the district Kangra (2.3%) was because of presence of the government medical college in the district.

In outcome indicator, on account of further cross checking with 50 random cases, there was downward trend of the disease transmission which was reflected by minimal default, failure and mortality rates and so are the transferred

out and relapse rates. Maximum death rate (13%) (National standards being 0%–7%) was in TU Palampur, especially in the rural belted villages. This was because of long vacancy of MO TC of TU Palampur for one year. Other important findings in all TUs are the increased number of the extra pulmonary cases, as high as 61% in TU Dharamshala as against the normal range of 15%–20%. The reasons for their higher detection need to be explored further.

In the case management

In the input indicator, despite abundance buffer stocks of the drugs and cards, a median 85% of the DOTS centers with a gap of 20% are there. Minimal DOTS centers (58%) are in TU Nurpur due to the political considerations. Five STS are present and fully trained. DOTS centers need to be activated to the full strength. *In process indicator,* 96% of the cases are getting the supervised treatment. The number of the supervisory visits by the different health officers/officials lies in the range of 0%–100%, the median being 66%. The lower down in the ladder of the health providers, the facilitative supervision and motivation/counseling also dwindles down owing to lack of communication and CME, rough and tough topography and shortage of the staff and skill. *In Output Indicator,* the successful completion of the NSP cases reflects in the range of 86%–93%, the median being 89%. The social stigmas of tuberculosis; distantly set up DOT centers and side

effects of the anti tubercular medicines in the form of nausea, skin rashes and a few cases of jaundice in the area are some of the reasons for the increased defaulter rate in TU Dharamshala (6%). *In Outcome Indicator*, the cure rate rolls in the range 81%–90%; the lowest in TU Dharamshala as 81% (median being 86%) the sputum conversion rate at 3rd month lies in between 91% and 97% (median being 95%). So, finally we observed that the outcome/impact indicators are in consistence with programme targets of the RNTCP in district Kangra.

In the IEC management

In input indicator, all five TUs/DMCs have sufficient IEC materials and funds of Rs. 108,000 INR to be equally divided among five TUs. *In process indicator*, sufficient IEC materials have been displayed in all 29 microscopic centers with Rs. 21,500/- spent for IEC activities from each TU. *In output indicator*, the awareness level in the TU Palampur is the highest (76%); more so in males and urban set up and the minimum being in TU Dehra (51%). The energetic IEC is the order of the day.

CONCLUSION

Despite several gaps identified as part of the evaluation such as (i) vacancies of medics and paramedics, (ii) gaps in knowledge in health personnel, (iii) Insufficient supportive supervision by the seniors, (iv) increased number of the extra pulmonary cases, and (v) increasing defaulter rate; RNTCP has successfully achieved all its targets in all the five TUs of Kangra District as per national norms.

RECOMMENDATIONS

Fill the vacancies of medics and paramedics. Reorientation trainings/refresher courses need to be started for the medical officers and other para medical staff.

Medical officer of tuberculosis unit, senior treatment supervisor and senior treatment laboratory supervisor must be regularly supervised.

Evolve a method to cross check the supervisory visit of the junior supervisors by the senior supervisors.

Explore the causes for the increased number of the extra pulmonary cases in the Kangra district.

Patient should be counseled about the importance of directly observed treatment and so as to avoid the social stigma and humiliation, DOTS should be provided at home by health providers, like multiple health workers/anganwari workers/village health guides.

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