

## Evaluation of Revised National Tuberculosis Control Programme, District Kangra, Himachal Pradesh, India - A Revised Version

Gupta S. N. \*, Gupta Naveen\*\*, Gupta Shivani\*\*\*

\*District AIDS Program Officer, Chief Medical Officer office, Department of Health and Family Welfare, Kangra at Dharamshala-Himachal Pradesh-India. \*\*Freelance researcher in Epidemiology and Ayurveda, Kangra, Himachal Pradesh\_India. \*\*\*Free lance researcher in infectious diseases and food technology, Kangra\_Himachal Pradesh.

---

---

### 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% to 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-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 in young cases (EPTB) are present in all TUs, as high as 61% in TU Dharamshala (Normal range 15%-20%). A gap of 20% DOT centre exists- the least in (58%) in TU Nurpur. The awareness level in the TU Dehra is minimum (51%); more so in adolescent 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 re-orientation trainings/refresher courses; (ii) conduction of supportive supervision by the seniors; (iii) investigation of cause of increased number of the extra pulmonary cases in adolescent and young ages and (iv) need of aggressive IEC activities.

**Keyword:** Extra Pulmonary Tuberculosis; Kangra; RNTCP Tuberculosis Unit.

---

---

### 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

---

---

**Corresponding Author:** Gupta S. N., District AIDS Program Officer, Chief Medical Officer office, Department of Health and Family Welfare, Kangra at Dharamshala -176001, Himachal Pradesh-India.

E-mail: drsurendernikhil@yahoo.com

9.6% of adult deaths in the 15-59 years 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.

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 programme 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 2nd 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

#### 1. 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.

#### 2. Qualitative methods

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. Apart from the health officials, 50 patients who had completed treatment were selected from 2nd quarter to fourth quarter 2006 to check the consistency of the reports and actual outcome.

#### Observation

Different level of health institutions likes, District TB center, Microscopic center, DOTS Center and Tuberculosis patient's house have been visited during the study to understand the structure of RNTCP, its functioning at different levels and ultimately the treatment outcomes i.e. the cure rate, sputum conversion rate and annualized case detection rate with the use of checklist (Annexure 1, 2) and semi-structured questioner.

#### Annexure-1

##### Checklist for a visit to Microscopic Center

Interview with laboratory staff

- How many staff works in the laboratory?
- Have they received the RNTCP training? When?
- Do they have RNTCP laboratory manual?

Smear request form

- How are smear requested and reported?
- Is the RNTCP smear request form used?

Sputum containers

- Are there adequate supplies?
- Are they marked properly (laboratory number on the side)?

Laboratory register

- Is the RNTCP laboratory register used?
- Is it up to date?
- Is it filled in completely?
- Do negative suspects have three negative smears?
- Do positive cases have two positive smears?
- Are positive results written in red?
- How many smears (diagnosis and follow up) were examined recently?

Slides

- Are there adequate supplies?
- Are slides marked with a diamond pen?
- Is the laboratory number marked properly on the slide?
- Check some positive and negative smears for smear preparation, staining, and correct reporting?

Reagents

- Are there sufficient quantities of reagents?
- Are bottles labeled correctly with name and date of preparation?

Microscope

- Type (binocular / monocular electric/ light) and its condition?

Quality control

- Are slides kept for quality control?
- Are there sufficient slide boxes?
- How often are slides sent for quality control?
- How are slides sampled for quality control?
- Has the laboratory received results of quality control?

Disposal

- Method of waste disposal (burial/ burning)?

**Annexure-2****Check list for TB Clinic**

Interview with patient

Interview with staff

- Who sees the patients in the clinic?
- Have they received the RNTCP training? When?
- Do they have RNTCP manual?
- How do they supervise treatment?
- Who does late patient tracing?

Treatment cards

- Are cards stored properly?
- Check correctness completeness, consistency and credibility?
- Check categories, treatment, and medicine taken?

TB Register

- Is it up to date?
- Check correctness completeness, consistency, and credibility?
- Compare with laboratory register; any pretreatment defaulters? Any discrepancies?
- Compare with treatment card – any discrepancies?

Cohorts

- Check reports prepared by treatment center staff?
- Prepare case finding, two-month conversion and treatment outcome cohorts?
- Any discrepancies?

**Store**

Medicines

- Are there adequate quantities of anti-TB medicines?
- Are medicines stored properly?
- Check expiry dates. Is a FEFO system used?
- Are stock cards kept up to date?
- Do the stock card match the actual stocks (check at least one medicine)?

**Data analysis**

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

as 3<sup>rd</sup> year districts) districts Lahaul and Spiti, Una and Kullu have started service delivery from first quarter of 2001 and Bilaspur in the 2nd quarter of 2001. Kinnaur and Chamba have also started service delivery in December 2001 and January 2002 respectively.

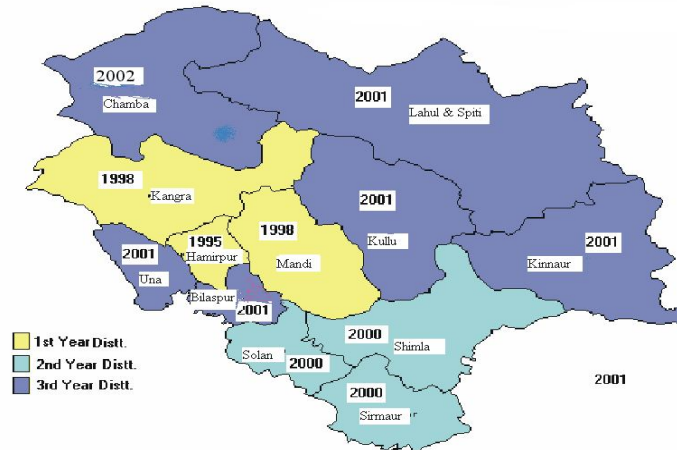
**Description of RNTCP**

*Background:* RNTCP was implemented in Himachal Pradesh in phased manner. Out of twelve districts Hamirpur was the first District where RNTCP was implemented in 1995, followed by Kangra and Mandi in 1998. These three districts are collectively called as 1<sup>st</sup> year district. Shimla, Solan and Sirmaur have started the programme from 1<sup>st</sup> July 2000. These three districts are collectively called as 2<sup>nd</sup> year districts. Out of remaining six (collectively called

**RNTCP in State and Kangra District***Structure*

*State level:* At state level, the State Tuberculosis Officer (STO) is responsible for planning, training, supervising and monitoring the programme in the state. He is responsible administratively to the State Director of Health Services and technically follows instructions of the Central TB Division.

**Fig 1:** Status of RNTCP implementing District in HP



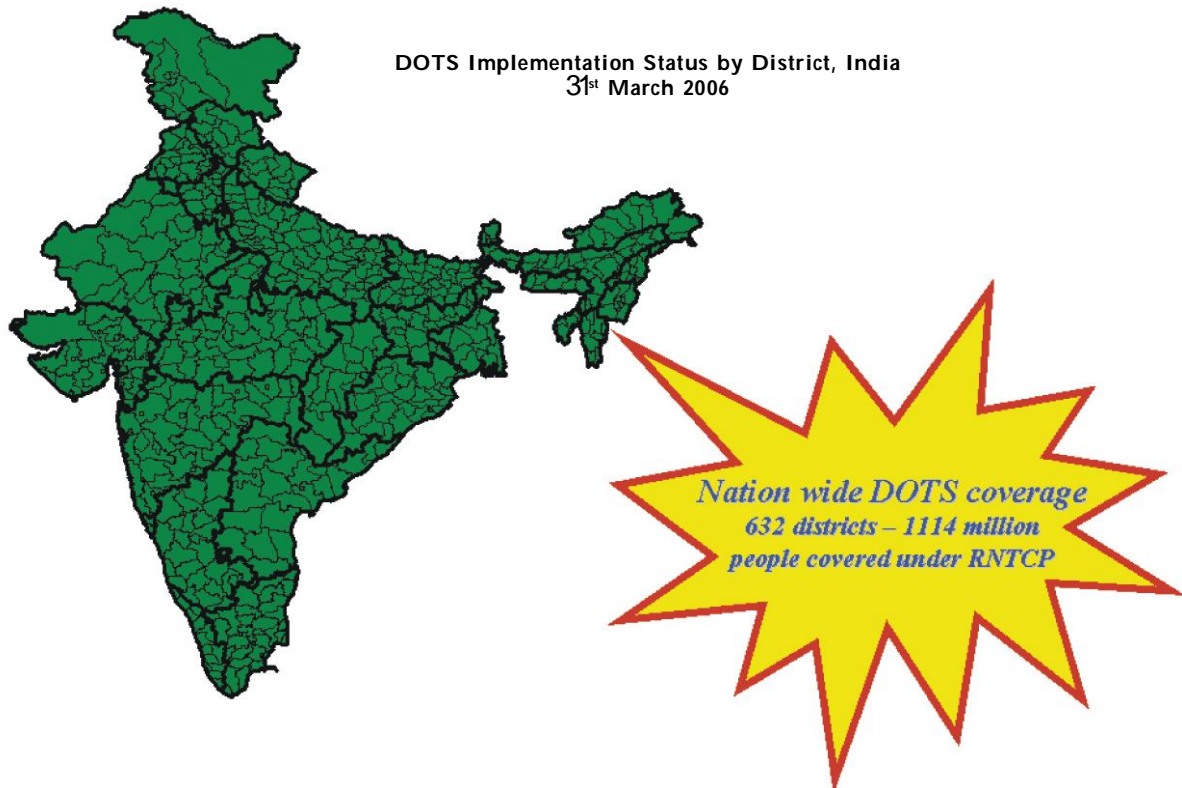
Source: Directorate of health services Himachal Pradesh

*District Tuberculosis Centre level*

RNTCP had been started in the Kangra district since October, 1998. The district tuberculosis officer (DTO) at the DTC has the overall responsibility of the programme at the district level and is assisted by a Medical Officer, a statistical assistant and other paramedical staff. District Tuberculosis Control Society with the District Collector as the Chairman, DTO as Member Secretary, with governmental and non-governmental representatives has been created and made functional. It is responsible for monitoring the programme implementation, arranging necessary

logistics such as transport and procuring materials such as laboratory consumables.

Tuberculosis unit level: A team comprising a specifically designated Medical Officer-Tuberculosis Center (MO-TC), Senior Treatment Laboratory Supervisor (STLS) and Senior Treatment Supervisor (STS) are based at a sub-divisional level i.e. the Tuberculosis Unit (TU) level. The team constitutes the Tuberculosis Unit, and the STS and STLS are under the administrative supervision of the DTO. The STS is responsible for accurate maintenance of the tuberculosis register and timely submission of



quarterly reports along with monitoring and supervision at the TU level.

### Data analysis

Data generated was 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 5 tuberculosis units for evaluation, the results of which are shown in the following logic model tables 1, 2 and 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 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% to 90% with the sputum conversion rate at 3<sup>rd</sup> month in between 91% and 97%. Under *IEC management evaluation*, sufficient IEC materials and funds of Rs. 108000/- for 5 TUs have been distributed. The awareness level in the TU Palampur is the highest (76%); more so in young males and urban set up while that of TU Dehra it is minimum (51%); more so in adolescent females and rural set up.

### Discussion

This study was conducted for the evaluation of RNTCP in district Kangra from 2<sup>nd</sup> to 4<sup>th</sup> 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 programme. The overall proportion of the slides cross checked is 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 suffers. There are 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

**Table 1:** Logic Model for evaluation of Revised National Tuberculosis Control Program (RNTCP), District Kangra-Himachal Pradesh, India, 2007. (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	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 medical officers	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 lab. - Technicians	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
-Trained health care workers	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
-Laboratory reagents/equipments	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.
-Internal Quality Control.	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
Process	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
Trainings	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
Sputum collection and examination	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 lab. Register of the microscopic centre	DTC, 5 TUs	Laboratory technician	Laboratory register
Cross-checking of slides	Output						
Cases identified for sputum positivity							

**Table 2:** Logic Model for evaluation of Revised National Tuberculosis Program, Kangra-Himachal Pradesh, India, 2007 (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 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
Drugs	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
DOTS providers	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
Senior treatment supervisors	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
Treatment cards	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
Process	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
Supervised treatment	Number of the supportive 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
Supportive supervision	Output						
The patients successfully	Proportion of the cases successfully completing the treatment=168	No. of the patients successfully completing the treatment=168	District records	Review of the records	DTC, 5 TUs	Interview of STS	Treatment register

**Table 3:** Logic Model for Evaluation of Revised National Tuberculosis Program, Kangra-Himachal Pradesh, India, 2007 (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%)	No. of the health facilities having the IEC materials=101	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)	District records	Review of records	DTC, 5 TUs	Interview of DTO, MO TC.	Cash register
Process Display of the IEC materials	Proportion of the health facilities displaying the IEC materials (100%)	Total funds (Rs.108,000) No. of the health facilities displaying the IEC materials=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%)	Total no. of the health facilities=101 Number of the health facilities utilizing the funds for IEC=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%)	Total number of health facilities=101 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

**Table C:** Interview/Treatment card/Laboratory Register/TB Register of patient registered in Quarter 4<sup>th</sup>, 2006, Kangra, Himachal Pradesh, India. (Mark 1 for Yes and 0 for No)

S.No	Indicator	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
<b>Interview of patient Check consistency between recorded patient information versus actual patient information (Carry treatment cards for interview)</b>											
1.	Did the patient has any previous H/o treatment taken from the pt. practitioner/or X-rayed?										
2.	Is the patient aware that he/she is/was undergoing treatment for TB?										
3.	Did the patient complete/cure/default/fail/transferred out during the treatment?										
4.	Does the patient know the correct duration of treatment for his TB?										
5.	Did the patient take at least 20 of 24 doses under direct observation in the I P?										
6.	Did the patient take at least one dose in a week under direct observation in the CP?										
7.	Does the patient know that no taking drugs under direct observation can lead to unfavorable Rx outcomes?										
8.	Does the health worker pay any home visits										
9.	Is participating in DOT convenient to the patient? (In terms of DOT place, DOT provider DOT time)										
10.	Did the patient have to pay for sputum examination at the MC?										
11.	Did the patient have to pay for TB drugs after being registered in the RNTCP?										
12.	Did the patient mention that he provided at least two sputum samples before the start of treatment?										
13.	Did the patient mention that he provided at least two sputum samples at the end of two months of treatment?										
14.	Age of the patient(completed age in years)										
15.	Sex of the patient(M= male, F=female)										
16.	Is the patient Tribal?										
17.	Was the patient satisfied with the interaction and support provided by the programme staff										
<b>Check treatment card (check consistency of information between treatment and Lab register)</b>											
18.	Is the patient's 2 month follow up sputum result on treatment card consistent with result and grade recorded in Lab register?										
19.	Is the patient's treatment regimen on the treatment card consistent with the categorization in the TB register?										
20.	As per the treatment card, is the patient reported to have been on DOT during IP? (at least 20 of 24 doses)										
21.	As per treatment card, is the patient reported to have been on DOT during CP (at least one dose a week)										
<b>Check Laboratory Register (Check consistency of recording between TB register and Lab register at the MC)</b>											
22.	Treatment outcome of the patient as per the TB register (Cured/Completed/Died/Failure/Transferred/Defaulted)										
23.	In the laboratory register, is there a record of the patient's initial sputum examination?										
24.	As per the Lab register, did the patient have at least two initial sputum samples examined before start of treatment										
25.	Is the result (including grade) in the Lab register consistent with the result in the TB register										
26.	Is there a record of patient's two-month follow up sputum examination in the Lab register?										
27.	Did the patient have at least two follow up sputum exams at the end of two months?										



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 centres 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% to 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% to 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% to 90%; the lowest in TU Dharamshala as 81% (median being 86%) the sputum conversion rate at 3<sup>rd</sup> month lies in between 91% to 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/- to be equally divided among five TUs. *In process indicator*, sufficient IEC materials have been displayed in all 29 microscopic centres 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%), adolescent females and rural set up [9].

### **Limitation of study**

1. Sample population selected was very small.
2. Time spent on study was very small and limited.
3. Parameters chosen were many, like cure rate, defaulter rate, death rate etc. These may be dealt each in the separate study.

### **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 in young and adolescent population, (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. Re-orientation 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 and that too in young and adolescent population.
- 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.

### **Future scope of the study**

Many studies are yet to be done in this field as this program is still in the evaluation period. Some suggested studies are:

- There should be a cross-sectional study on the hospital based data to evaluate sputum microscopy, prescribed drugs to all defaulters and relapse cases.
- To evaluate defaulter and relapse in RNTCP, a prospective study should be done.
- Adverse reaction of anti tubercular treatment may be a topic for the study.
- Sputum negative tuberculosis- Category should be studied in detail.
- Imbalance ratio of NSP: NSN needs further exploration in the district.
- Knowledge, attitude and perception status of general population and the contact cases of the patient is an important area of study.
- Causes of the defaulters and relapse cases may be studied in detail.
- The study on multi-drug resistance TB is to be done.

### Acknowledgements

We gratefully acknowledge the cooperation we received in the evaluation of RNTCP program from the Offices of Directorate of Health Services, Shimla; Chief Medical Officer; District Tuberculosis Officer, Kangra at Dharamshala and patients and their

---

### Annexure-3

#### Form-1

#### Questionnaire for State Tuberculosis Officer

Name..... Designation.....

Name of the State.....

No. of service years in this position..... Date of Visit.....

#### GENERAL

Q. When was the RNTCP started in State of Himachal Pradesh?

Q. What is the population under RNTCP?

Q. What were the reasons for developing RNTCP?

Q. What are the objectives of RNTCP?

Q. When was the last RNTCP training for Medical Officers and health workers organized?

Q. How many meetings do you hold with all the District Tuberculosis Officers to discuss administrative and technical matters pertaining to RNTCP implementation in a year?

Q. On what basis is the state quarterly analysis report prepared?

Q. How often do you review quarterly reports and send feed back to the districts.

Q. How often do you visit each implementing district in a year?

Q. How often does state health secretary review the programme?

Q. Is the RNTCP being implemented successfully in the state?

Q. In your opinion what further steps can make the programme more successful?

---

**Form -1**

**Questionnaire for District Tuberculosis Officer**

Name..... Designation.....  
Name of the State..... Name of the District.....  
No. of service years in this District..... Date of Visit.....

- Q. When was the RNTCP started in District Shimla of Himachal Pradesh?
- Q. What is the population under RNTCP?
- Q. What were the reasons for developing RNTCP?
- Q. What are the objectives of RNTCP?
- Q. When was the last RNTCP training for medical officers and health workers organized?
- Q. How many technical and administrative review meetings do you hold with MO-TC and all STS/STLS in a year?
- Q. How often do you visit Tuberculosis Unit of your district in a year?
- Q. Is there documentary evidence of 2.2(e.g. trip report, diary)?  
Yes  No
- Q. How often do you visit the microscopic centers of your district?
- Q. Is there documentary evidence of 2.4(e.g. trip report, diary)?  
Yes  No
- Q. How often does the District Magistrate review the programme and facilitates coordination with other sectors / programmes?
- Q. How often does the Chief Medical Officer review the programme and facilitates?
- Q. Has there been any drug stock out in the district in the past one year?
- Q. Has there been any expiry of drugs in the district in the past one year?  
Yes  No
- Q. Is the RNTCP being implemented successfully in the state?
- Q. In your opinion what further steps can make the programme more successful?
- 

**Form-2**

**QUESTIONNAIRE FOR MOTC in-charge of the TU**

Name..... Designation.....  
Name of the District..... Name of the TU.....  
No. of service years in this Institution..... Date of Visit.....

**General**

- Q. What is the population of the area served by this TU?
- Q. What are the private health services available in the area?

- Q. What are the numbers of beds in the institution?  
Sanctioned In Position
- Q. What are the numbers of outpatients for last one year?
- Q. What are the major public health problems in the area served by the institution?
- Q. What are the services available in the institution?
- Q. What is the staff available in the institution?

#### **Diagnosis of Tuberculosis**

- Q. What definition do you use for TB suspect?
- Q. Where does screening of TB suspect take place?
- Q. Who does the screening of TB suspect?
- Q. How is the screening of TB suspect done?
- Q. What routine investigation is ordered for TB suspects?
- Q. How many sputum smear examinations are ordered for a TB suspect?
- Q. Do people with respiratory symptoms use the private sector? If so how are they managed?

#### **Treatment of TB**

- Q. Where does patient get their treatment?
- Q. What treatment categories, regimens and dosage are used?
- Q. Who directly observe treatment?
- Q. What quantity of medicines is dispensed in the intensive phase?
- Q. What quantity of medicine is dispensed in the continuous phase?
- Q. Who gives patient education and counseling?
- Q. How often are patients called for follow up during treatment?
- Q. How often are smear examinations ordered during treatment?
- Q. By whom, when and how is the late patient tracing done?
- Q. Do patient with TB gets treatment in the private sector? What treatment regimen does private practitioner use?
- Q. Is preventive therapy used, if yes for whom?

#### **Recording and reporting**

- Q. Who maintains treatment cards and TB registers?
- Q. Who prepares the quarterly reports?
- Q. Is there a system for cross checking the TB registers with the laboratory register?

#### **Training and Supervision**

- Q. When was the last RNTCP training for health workers in the institution?
- Q. How often health workers trained?
- Q. How often do RNTCP supervisors visit the institution?
- Q. When was the last supervisory visit from the RNTCP?
- Q. What do supervisors do on their visits?
- Q. Do supervisors use a supervision checklist?
- Q. Is feedback verbal or written provided by the supervisors?

**Medicines**

- Q. How are anti TB medicines ordered?
  - Q. How often do supplies of medicines come?
  - Q. Are quantities sufficient?
  - Q. Has there ever been shortage of ant TB medicines?
  - Q. How many supervisory visits have you made in last one month to the Peripheral Health Institutions?
  - Q. What was the smear conversion rate reported for the TU in the last quarter?
  - Q. What was the cure rate reported for the TU in the last quarter?
- 

**Form-3**

**Questionnaire for Medical Officer of The MC**

Name..... Designation.....

Name of the District..... Name of the TU.....

No. of service years in this Institution..... Date of Visit.....

**General**

- Q. What is the population of the area served by this MC?
- Q. What are the private health services available in the area?
- Q. What are the numbers of beds in the institution?  
Sanctioned                                      In Position
- Q. What are the numbers of outpatients for last one year?
- Q. What are the major public health problems in the area served by the institution?
- Q. What are the services available in the institution?
- Q. What is the staff available in the institution?

**Diagnosis of Tuberculosis:**

- Q. What is the definition used for TB suspect?
- Q. Where does screening of TB suspect take place?
- Q. Who does the screening of TB suspect?
- Q. How is the screening of TB suspect done?
- Q. What routine investigations are ordered for TB suspects?
- Q. How many sputum smear examinations are ordered for a TB suspect?
- Q. Do people with respiratory symptoms use the private sector? If so how are they managed?

**Treatment of TB:**

- Q. Where does patient get their treatment?
- Q. What treatment categories, regimens and dosage are used?

- Q. Who directly observe treatment?
- Q. What quantity of medicines is dispensed in the intensive phase?
- Q. What quantity of medicine is dispensed in the continuous phase?
- Q. Who gives patient education and counseling?
- Q. How often are patients called for follow up during treatment?
- Q. How often are smear examinations ordered during treatment?
- Q. By whom, when and how is the late patient tracing done?
- Q. Is preventive therapy used, if yes for whom?

#### Recording and reporting

- Q. Who maintains treatment cards and TB registers?
- Q. Who prepares the quarterly reports?
- Q. Is there a system for cross checking the TB register with the laboratory register?

#### Training and Supervision

- Q. When was the last RNTCP training for health workers in the institution?
- Q. How often are health workers trained?
- Q. How often do RNTCP supervisors visit the institution?
- Q. When was the last supervisory visit from the RNTCP?
- Q. What do supervisors do on their visits?
- Q. Do supervisors use a supervision checklist?
- Q. Is feedback verbal or written provided by the supervisors?

#### Medicines

- Q. How are anti TB medicines ordered?
- Q. How often do supplies of medicines come?
- Q. Are quantities sufficient?
- Q. Has there ever been shortage of ant TB medicines?
- Q. Are you trained in RNTCP?
- Yes  No
- Q. Do you have a copy of any of the following documents?  
1) Technical guidelines. 2) RNTCP at a glance. 3) Key facts and concepts. 4) Desk reference.
- Yes  No
- Q. What was the number of sputum smears examined last month in the MC and what percentages of them were positive.
- Q. How often do you review patient treatment activities with Multi Purpose Worker?
- Q. Have any irregular/defaulting patients brought back on treatment?
- Yes  No

**Form -4**

**Questionnaire for Sts at The Tu Level**

Name.....

Designation.....

Name of the District.....

Name of the TU.....

Date of Visit.....

- Q. How often do you visit each DOT center in your TU area?
- Q. What do you do to bring irregular patient back on treatment?
- Q. How often do you review patient treatment activities with Multi Purpose Worker?
- Q. How do you maintain details of your field activities?

---

**Form 5**

**Questionnaire for StIs at the Tu Level**

Name.....

Designation.....

Name of the District.....

Name of the TU.....

Date of Visit.....

- Q. How do you review the slides?
- Q. How do you maintain details of your field activities?

---

**Form -6**

**Questionnaire for Lt at The Mc Level**

Name.....

Designation.....

Name of the District.....

Name of the MC.....

Date of Visit.....

**General**

- Q. What are the numbers of staff working in the laboratory?
- Q. What is the number of staff who does smear examination?
- Q. What other investigations are done in the laboratory?
- Q. What are number of sputum smears examined each day/month/year for AFB?
- Q. Does the laboratory do any other investigations for TB (culture/sensitivity etc)?

**Equipment and supplies**

- Q. What is the type of microscope and power supply the laboratory has?
- Q. What is the condition of the microscope?
- Q. How are supplies (sputum containers, slides, reagents, and chemicals) ordered?
- Q. How often are they supplied?
- Q. Has there been any shortage of supplies?
- Q. Are there adequate supplies of reagents, slides and other consumables for the next one-month?

- Q. Who prepares the reagents, how are they prepared and where are they prepared?
- Q. Are reagents labeled?
- Q. How long are reagents used for?
- Q. Any problems with old reagents?

#### **Sputum Collection**

- Q. Where do patients cough up their sputum specimens?
- Q. Does any one observe them?
- Q. Where is sputum collected in?
- Q. How are sputum containers labeled?
- Q. How many sputum specimens are collected for each TB suspect?

#### **Smear preparation and examination**

- Q. Who prepares the smears?
- Q. Who stains them?
- Q. What stains are used?
- Q. Who examines the smears?
- Q. How long does it take to examine a negative smear?
- Q. For the previous quarter, were three sputum smears done for 80% of the chest symptomatic? Count from the Lab register.  
Yes  No
- Q. For the previous quarter, were two sputum smears done for 80% of the follow up patients? Count from the Lab register.  
Yes  No

#### **Recording and reporting**

- Q. Do you have a smear examination form?
- Q. Who fills it in?
- Q. Do you have an RNTCP laboratory register?
- Q. Who fills it in?

#### **Quality control**

- Q. What quality control system do you have?
- Q. Are slides kept for quality control after examination?
- Q. How do you preserve slides for review by STLS?
- Q. How often are slides sent for quality control?
- Q. Has the laboratory received any feedback on quality of smear examination?

#### **Training and Supervision**

- Q. How often do laboratory technicians receive training from RNTCP?
- Q. When was the most recent training by the RNTCP?
- Q. Do you have a supervision system for the laboratory?
- Q. When was the most recent supervisory visit?
- Q. What is the importance of 3 sputum exams for diagnosis and 2 sputum exams for follow up?



**Form - 7**

**Questionnaire for Dots Provider**

Name.....

Designation.....

Name of the District.....

Name of the TU.....

Name of the PHC/CHC.....

Name of the HSC.....

No. of service years in this area.....

Date of Visit.....

**General**

- Q. What is the population of the area served by the institution?
- Q. What other public health services are in that area?
- Q. What other private health services are in that area?
- Q. What are the numbers of outpatients per year?
- Q. What are the major health problems in the area served by the institution?
- Q. What are the services available in the institution?

**Treatment of TB**

- Q. Where does patient get their treatment?
- Q. How do you maintain boxes for each patient?
- Q. Who directly observe treatment?
- Q. How do you mark the treatment cards at the time of giving each dose?
- Q. How do patient receive every dose of drug during Intensive Phase?
- Q. How do patient receive every dose of drug during Continuous Phase?
- Q. When do patients bring back empty blister packs, when they collect weekly drugs?
- Q. Check the consistency between number of doses on treatment card and drug box? Check any two boxes?  
Box - 1            Yes        No      
Box - 2            Yes        No
- Q. Does the treatment observer make home visits to verify addresses of patient?  
Yes        No
- Q. Do you have clean water, disposable cups, and privacy for DOT patients?  
Yes        No

**Recording and reporting**

- Q. Who maintains treatment cards?
- Q. At what dose in intensive phase are you supposed to give the sputum container for follow - up examination?
- Q. How do you bring irregular patients back on treatment?
- Q. How often are smear examinations ordered during treatment?

**Training and Supervision**

- Q. When were you trained under RNTCP?
- Q. How often do RNTCP supervisors visit the institution?
- Q. When was the last supervisory visit from the RNTCP?
- Q. What do supervisors do on their visits?
- Q. Is feedback verbal or written provided by the supervisors?

families and numerous individuals in five tuberculosis units of Kangra, Himachal Pradesh. A special word of thanks is also due to guidory support and supervision from National Institute of Epidemiology, Chennai, India.

#### References

1. Dubos, R. & Dubos, J. *The White Plague* (Rutgers Univ. Press, New Brunswick, New Jersey, 1987) Available from: [www.nature.com/nature/journal/v358/n6387/abs/358538b0.html](http://www.nature.com/nature/journal/v358/n6387/abs/358538b0.html)-33k.
  2. WHO (1999), *World Health Reports 1999, making a difference: report of Dir. Gen. WHO.*
  3. WHO, *Stop TB, India Revised National TB Control Program, and Results updated 2006*.
  4. RNTCP Status Report; Annual Report 2006. Available from: <http://www.tbcindia.org/documents.asp#> [Last accessed on 2010 Aug 04].
  5. State TB Control Society, RNTCP Status Report; Annual Report 2006 Directorate of Health, Hyderabad, India, 2006. Available from: <http://www.tbcindia.org/documents.asp#> [Last accessed on 2010 Aug 04]. Directorate of Health Services, Department of Health and Family Welfare. Himachal Pradesh, India: Health at a glance; 2005.
  6. Radhakrishnan SG & Sunithi, Performance of RNTCP in Himachal Pradesh and Kerala, *NTI Bulletin*, 2003.
  7. Introduction: Tuberculosis Control: Health Programme; URL: [http://gujhealth.gov.in/health\\_programmes/tb/index.htm](http://gujhealth.gov.in/health_programmes/tb/index.htm) [Last accessed on 2010 Aug 04].
  8. Secondary data from the offices of (i) Directorate of Health, Shimla, (ii) Chief Medical Officer, Kangra and (iii) District Tuberculosis Officer Kangra at Dharamshala, Himachal Pradesh, India: 2007.
  9. Gupta SN, Gupta N, Evaluation of revised national tuberculosis control program, district Kangra, Himachal Pradesh, India, 2007, *Lung India* 2011; 28:163-8
-