

# TB India 2006

RNTCP Status Report

**DOTS for All  
All for DOTS**



सत्यमेव जयते

Central TB Division  
Directorate General of Health Services  
Ministry of Health and Family Welfare  
Nirman Bhavan, New Delhi 110011  
<http://www.tbcindia.org>





# TB India 2006

## RNTCP Status Report

**DOTS for All : All for DOTS**

Central TB Division  
Directorate General of Health Services  
Ministry of Health and Family Welfare  
Nirman Bhavan, New Delhi 110011  
<http://www.tbcindia.org>

**This publication can be obtained from**

Central TB Division  
Directorate General of Health Services  
Ministry of Health and Family Welfare  
Nirman Bhavan, New Delhi 110011  
<http://www.tbcindia.org>

ISBN 81-902652-1-0

© Central TB Division, Directorate General of Health Services

स्वास्थ्य एवं परिवार कल्याण मंत्री  
भारत सरकार,  
निर्माण भवन, नई दिल्ली-110 011



Minister of Health & Family Welfare  
Government of India  
Nirman Bhavan, New Delhi - 110 011



डॉ अन्बुमणी रामदास  
**Dr. Anbumani Ramadoss**

## **FOREWORD**

It gives me immense pleasure to see that the Revised National TB Control Programme (RNTCP) has covered almost the entire country by the end of 2005. Started in 1997, the RNTCP has been implemented in a phased manner to ensure that quality of services is maintained. From 2002 onwards, the achievements of the RNTCP have contributed significantly to the global progress towards achieving the targets set by the World Health Assembly in relation to TB control. RNTCP has been cited as the fastest expansion of any country's Directly Observed Treatment Short Course (DOTS) programme in the history of DOTS, and has earned global recognition for its success. To date over 5 million patients have been initiated on treatment under RNTCP compared to the earlier NTP, and over 9 lakh additional lives have been saved as a result of the implementation of RNTCP.

In the first phase of RNTCP (1998-2005), the programme's focus was on ensuring expansion of quality DOTS services to the entire country. A lot of progress has been made during Phase I of RNTCP. However, there are many challenges remaining that the programme needs to overcome to achieve the TB-related targets set by the Millennium Development Goals for 2015 and to achieve TB control in the longer term.

The RNTCP has now entered its second phase in which the programme aims to consolidate the gains made to date, to widen services both in terms of activities and access, and to sustain the achievements for decades to come in order to achieve the ultimate objective of TB control in the country. New initiatives such as DOTS-Plus treatment for multi-drug resistant TB cases are included in RNTCP Phase II. All these new initiatives and the planned wider collaboration with other sectors aim to provide standardised, good quality treatment and diagnostic services to all TB patients in a patient-friendly environment, irrespective of the health care facility from which they seek treatment. The RNTCP II also envisages improved access to the marginalised groups such as urban slum dwellers, tribal groups, etc.

For this prolonged struggle towards achieving TB control in India, the highest levels of commitment are required from the States to maintain and improve the quality of the DOTS services provided to our citizens. Here, I would like to pay tribute to the multitude of health care workers, community workers and volunteers who, through their effort, have made the Revised National TB Control Programme a success, and urge them to continue their efforts with the same dedication.

I am glad that the sixth Annual Report of RNTCP is being published at this juncture in our long term work to control TB in India. I hope that the Report will facilitate sharing of experiences and lessons with all those involved in TB control and encourage all to join together to achieve the ultimate goal of a TB-free India.

**(Dr. Anbumani Ramadoss)**

21 February 2006

## Abbreviations

AIDS	Acquired Immune Deficiency Syndrome
ARTI	Annual Risk of TB Infection
CHD-SSH	Community Health Department, St. Stephen's Hospital
CLC	Central Laboratory Committee
CMO	Chief Medical Officer
CTD	Central TB Division
Danida	Danish International Development Assistance
DANTB	Danida Assisted Revised National Tuberculosis Control Programme
DMC	Designated Microscopy Centre
DFID	Department for International Development
DGHS	Directorate General of Health Services
DMCs	Designated Microscopy Centres
DOTS	Directly Observed Treatment Short-course
DRS	Drug Resistance Surveillance
DST	Drug Sensitivity Testing
DTC	District Tuberculosis Centre
DTO	District TB Officer
EQA	External Quality Assessment
GDF	Global TB Drug Facility
GFATM	Global Fund to Fight AIDS, Tuberculosis and Malaria
GLRA	German Leprosy Relief Association
GoI	Government of India
HIV	Human Immunodeficiency Virus
HRD	Human Resource Development
IAP	Indian Academy of Paediatrics
ICMR	Indian Council of Medical Research
IEC	Information, Education and Communication
IMA	Indian Medical Association
IRL	Intermediate Reference Laboratory
KAP	Knowledge, Attitude, Practices

LT	Laboratory Technician
MDG	Millennium Development Goals
MDR-TB	Multi Drug Resistant-TB
MPWs	Multipurpose Workers
NACP	National AIDS Control Programme
NGO	Non-Governmental Organisation
NRL	National Reference Laboratory
NTI	National Tuberculosis Institute
NTP	National Tuberculosis Programme
PLWHA	People Living with HIV/AIDS
PPM	Public-Private Mix
PTB	Pulmonary Tuberculosis
PWB	Patient-wise Box
RNTCP	Revised National Tuberculosis Control Programme
SCC	Short Course Chemotherapy
SEARO	South East Asia Regional Office
STC	State TB Cell
STDC	State TB Training and Demonstration Centre
STLS	Senior TB Laboratory Supervisor
STO	State TB Officer
STS	Senior Treatment Supervisor
TB	Tuberculosis
TBHV	TB Health Visitor
TRC	Tuberculosis Research Centre
TU	Tuberculosis Unit
USAID	United States Agency for International Development
UT	Union Territory
WHO	World Health Organization





## Contents

	<b>Foreword</b>	<b>3</b>
	<b>Abbreviations</b>	<b>4</b>
	<b>RNTCP Overview 2005</b>	<b>8</b>
<b>Chapter 1</b>	<b>Tuberculosis: Burden of the Disease in India</b>	<b>10</b>
<b>Chapter 2</b>	<b>DOTS – Its Advantages</b>	<b>12</b>
<b>Chapter 3</b>	<b>RNTCP: Implementation Status and Activities in 2005</b>	<b>16</b>
<b>Chapter 4</b>	<b>Success Stories</b>	<b>38</b>
<b>Chapter 5</b>	<b>Research Activities</b>	<b>42</b>
<b>Chapter 6</b>	<b>Performance of RNTCP</b>	<b>49</b>

# RNTCP Overview 2005

"The Revised National TB Control Programme is one of the best programmes..."

Union Health Minister Dr. Anbumani Ramadoss  
(Sunday Tribune, March 2005)



Launching of service delivery at Leh in Jammu and Kashmir by the Hon'ble Union Minister of Health and Family Welfare, Dr Anbumani Ramadoss, July 2005

The Revised National Tuberculosis Control Programme (RNTCP) now covers the entire country.

## RNTCP achievements till date

- ◆ Nationwide coverage by March 2006.
- ◆ Treatment success rate has more than trebled, from 25% in 1998 to 86% in 2004. Death rate has been brought down seven-fold, from 29% to 4%.
- ◆ The Programme involves more than 2000 non-governmental organisations (NGOs) and more than 10,000 private practitioners.
- ◆ Over 200 medical colleges and more than 100 corporate health facilities are participating in the Programme.
- ◆ More than 11,000 peripheral laboratories/ Designated Microscopy Centres (DMCs) have been established.
- ◆ More than 5.4 million patients have been initiated in treatment, saving almost a million lives.
- ◆ Master trainers on TB-HIV have been trained on TB-HIV related issues in 12 States.
- ◆ More than 500,000 public healthcare providers have been trained under the Programme.

## Expansion during 2005

- ◆ By December 2005, more than 97% of the country (1080 million in 616 districts) had access to DOTS.
- ◆ Increase in population coverage by 133 million in 69 districts.
- ◆ Every month more than 100,000 patients initiated on treatment.
- ◆ The States and Union Territories that were fully covered in 2005 under RNTCP were Andaman and Nicobar Islands, Dadra and Nagar Haveli, Daman and Diu, Jammu and Kashmir, Jharkhand, Lakshadweep, Tripura and Uttar Pradesh.

- ◆ Despite devastation by the tsunami in late 2004, the Andaman and Nicobar Islands were able to recover and provide facilities for TB patients.
- ◆ Jammu and Kashmir has a DOT centre at the highest altitude (at over 15,000 feet) in the country. The centre was inaugurated at Leh by the Hon'ble Union Minister of Health and Family Welfare, Dr Anbumani Ramadoss.

### Other achievements during 2005

- ◆ Initiated piloting of a 'referral for treatment' mechanism in 12 districts with large medical colleges, aimed at developing a seamless RNTCP service between medical colleges and general health services.
- ◆ External Quality Assessment (EQA) protocol and the revised RNTCP EQA guidelines have been finalised. EQA activities have been implemented in six large States and in parts of other States.
- ◆ Onsite evaluation of 14 State-level laboratory facilities has been done by teams from Central Institutes of RNTCP [National TB Institute (NTI) and Tuberculosis Research Centre (TRC)].
- ◆ Drug resistance surveillance (DRS) protocol finalised and State-representative DRS surveys initiated in Gujarat (August 2005) and Maharashtra (November 2005).
- ◆ DOTS-PLUS guidelines developed for starting treatment of MDR TB cases.
- ◆ Patient-wise Boxes (PWBs) for paediatric patients have been developed. This is a unique global achievement for RNTCP, as no other DOTS programme in the world has such PWBs for the treatment of children with tuberculosis. The first supplies should arrive during the first quarter of 2006.
- ◆ RNTCP training modules have been revised and put in use since January 2005 for training. Training modules on Public-Private Mix (PPM) have been developed.
- ◆ Training modules on TB-HIV issues have been developed jointly with the National AIDS Control Programme and are being used for various levels of health workers.
- ◆ TB-HIV co-ordination activities have been extended to another eight States. Thus, as of 2005, 14 States have initiated TB-HIV co-ordination activities.
- ◆ HIV surveillance in TB patients in four districts of southern States started.
- ◆ RNTCP has continued to improve drug logistics management in 2005 through training workshops on drug inventory management practice for District TB Officers (DTOs) and State level pharmacists .
- ◆ Intensive monitoring for 25 poor performing and highly populated districts initiated.
- ◆ Sites identified for conducting disease prevalence surveys in different zones and proposals invited.
- ◆ Mortality surveys started in Andhra Pradesh and Orissa.
- ◆ State specific Annual Risk of TB Infection (ARTI) surveys started in Andhra Pradesh and Kerala.
- ◆ A five-day national level training of Information, Education and Communication (IEC) officers of the States organised with the collaboration of Danida Assisted Revised National Tuberculosis Control Programme (DANTB) in Orissa.
- ◆ National level "TB Awareness Run" organised on World TB Day in collaboration with partners and was flagged off by Hon'ble Union Minister of Health and Family Welfare, Dr. Anbumani Ramadoss.
- ◆ PPM activities expanded. PPM Advocacy Kit developed for involvement of other sectors.
- ◆ A book entitled "Tuberculosis Control in India" edited by S.P. Agarwal and L.S. Chauhan (Directorate General of Health Services, Ministry of Health and Family Welfare, Government of India) covering all technical aspects of the Programme, was published.
- ◆ Second phase of RNTCP became effective from 1 October 2005 after Cabinet approval.
- ◆ Project Implementation Plan for RNTCP II prepared, approved by Government of India and waiting for approval from World Bank.
- ◆ Meeting of Health Secretaries of States and Union Territories held at Neemrana in November 2005.

# Tuberculosis: Burden of the Disease in India

“Together we can make a difference in the lives of TB patients and save the new generation from the dreaded disease.”

Dr. R.K. Srivastava, DGHS,  
–Excerpt from keynote address, NATCON Meeting, Lucknow,  
January 2006

Tuberculosis (TB) disease newly affects around 1.8 million Indians every year. It is an infectious disease caused by the bacillus *Mycobacterium tuberculosis* and spreads through the air. India accounts for a fifth of new TB cases in the world. TB-HIV co-infection makes the task of TB control a bigger challenge.

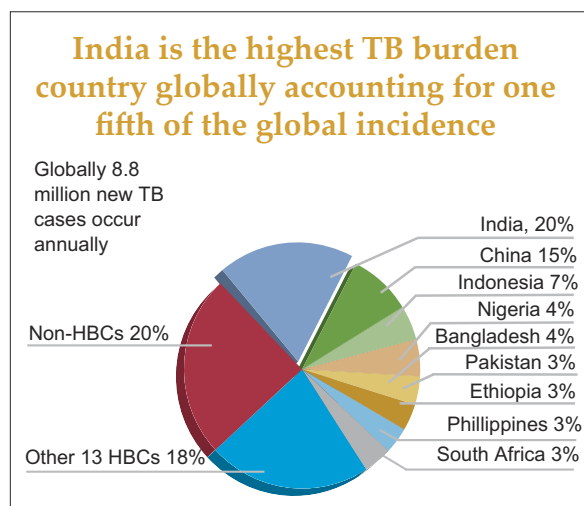
### Extent of the disease

Two of every five Indians are infected with the TB bacillus. Of them, 10% will develop TB disease during their lifetime. Every day, about 5,000 people develop the disease and around 1000 die. Every year, almost 1.8 million new cases occur in the country, of which almost half are infectious. Patients with infectious pulmonary TB disease can infect 10-15 persons in a year. Poorly

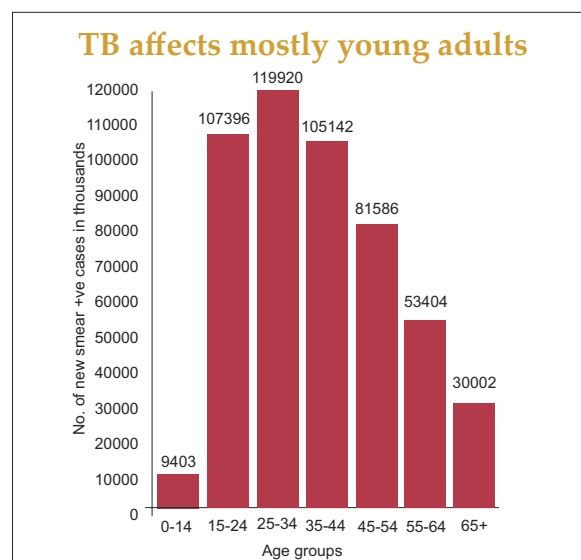
treated patients can develop drug-resistant and potentially incurable forms of TB.

### Economic burden of tuberculosis

In India, TB kills more adults in the most productive age group (15-54 years) than any other infectious disease. Almost 370,000 die every year. The disruption caused – to both society and economy – is incalculable. A patient of TB takes an average of three or four months to recuperate, losing that much income. The loss is disastrous for those struggling against poverty and under-development. The direct cost of the disease in India annually is estimated at US\$ 300 million annually; the annual indirect cost is US\$ 3 billion.



Source: WHO Geneva; WHO Report 2005: Global Tuberculosis Control; Surveillance, Planning and Financing



Source: RNTCP Data, 2005

TB is a curable disease even among individuals infected with HIV. Directly Observed Treatment, Short course (DOTS) is as effective among HIV-infected TB patients as among those who are HIV-negative.

### Social impact of the disease

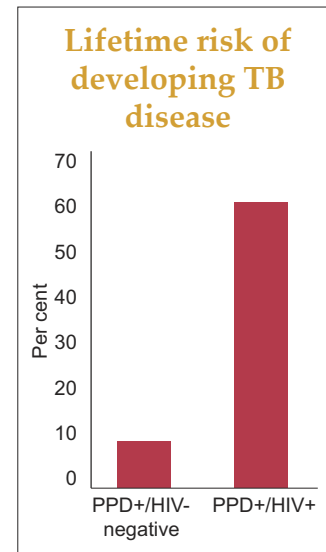
More women in India die of TB than any other infectious disease, and more than from all other causes of women's deaths put together. Children of parents with TB often drop out of school to supplement the family income and to help take care of siblings. The social stigma of the disease adds to the burden, of both men and women, particularly if the disease occurs in their youth. Studies indicate that while men have to deal with the stigma at their workplaces and in the community, women are ostracised in the household and the neighbourhood. More than 100,000 women with TB disease are abandoned by their families every year. Studies also indicate that women feel disinclined to discuss their illness or participate in social life.

### Tuberculosis and HIV

TB is the most common opportunistic disease that affects people infected with HIV. As HIV debilitates the immune system, vulnerability to

TB is increased. India has the second largest HIV-infected population in the world with over five million Indians infected with HIV. Of them, two million are estimated to be co-infected with TB. The lifetime risk of people developing TB disease is 10% in those persons

who are infected with TB and are HIV-negative, compared to over 50% in the case of people infected with HIV. HIV is the most powerful risk factor for the progression of TB infection to the disease. In a reciprocal manner, TB accelerates the progression of HIV into AIDS, thus reducing the chances of survival of HIV-positive persons.



TB affects the most productive age group (15-54 years) than any other infectious disease

## DOTS – Its Advantages

Five thousand people (*globally*) die from tuberculosis every day, although the disease is both preventable and curable. Clearly, we must work harder if we are to achieve, by 2015, the Millennium Development Goal of halting and beginning to reverse the spread of TB as one of the world's major diseases.

Kofi A. Annan  
UN Secretary-General

### Five components of DOTS

- Political and administrative commitment
- Good quality diagnosis, through sputum microscopy
- Uninterrupted supply of good quality drugs
- Directly observed treatment
- Systematic monitoring and accountability



Smt. Panabaka Lakshmi, Minister of State for Health giving DOTS to a TB patient in the Multi Media Campaign in Vellore district of Tamil Nadu, November 2005

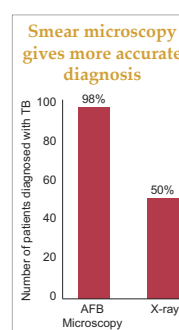
### Political and administrative commitment

Since TB can be cured and the epidemic reversed, it warrants the topmost priority, which has been accorded by the Government of India. This priority should be continued and expanded at the State, district and local levels. The Government's commitment is measured in terms of funds granted, human resources and administrative support. The success of the Revised National Tuberculosis Control Programme (RNTCP) bears

testimony to the commitment of the Government. The Union Cabinet has now approved the RNTCP Phase II for the period 2006-2010.

### Good quality diagnosis through sputum microscopy

Top quality microscopy allows health workers to detect the TB bacillus and is essential for identifying the infectious patients who need treatment the most. Sputum microscopy is the best tool for detection as it provides information on the infectiousness of the patient, helps in categorisation of the patient for treatment and is an objective method to monitor the patient's





progress. Other advantages of this method are that it is relatively easy to perform and less expensive than an X-ray. The result is available within two days and correct treatment can be started without delay. Although sputum microscopy is the primary diagnostic tool, RNTCP diagnoses and treats all forms of TB using standardised diagnostic algorithms.

### **Uninterrupted supply of good quality drugs**

An uninterrupted supply of good quality anti-TB drugs must be available. In the RNTCP, an individual box of medications for the entire treatment is earmarked for every patient registered, ensuring the availability of the full course of treatment to the patient the moment he/she is registered for treatment. Hence, Directly Observed Treatment, Short course (DOTS) ensures patient adherence, and prevents development of multi-drug resistant (MDR) TB.



### **Directly observed treatment**

The heart of the DOTS programme is 'directly observed treatment' (DOT), in which a health worker or another trained community volunteer who is not a family member, watches as the patient takes the anti-TB medicines in their presence. RNTCP uses intermittent short-course chemotherapy (SCC) regimens, which reduce the duration of treatment and facilitate directly observed treatment.



Under optimal conditions, treatment without observation achieves a success rate of 50–60%, whereas direct observation results in 85–95% success rate. In this way, DOT ensures that the patient adheres to the treatment until completion. The responsibility for this falls on the health provider, who ensures that the right drugs in the right doses are taken at right intervals for the right duration.

### **Systematic monitoring and accountability**

The Programme is accountable for the outcome of every patient put on treatment. RNTCP uses a standardised recording and reporting system. The cure rate and other key indicators are monitored at every level of the health system, and if any area is not meeting expectations, supervision is intensified. RNTCP shifts the responsibility for cure from the patient to the health system.

## DOTS in India

DOTS is the internationally recommended strategy for TB control, adopted as the Revised National Tuberculosis Control Programme in India. DOTS has proved to be an effective tool in controlling TB on a mass basis and is being used in over 180 countries. India has adapted and implemented DOTS in different parts of the country since 1993. A fully-fledged DOTS programme began in India in 1997 and has been expanded in a phased manner throughout the country. Large scale expansion of RNTCP was achieved with 50% coverage by 2002. By the end of 2005, RNTCP covered a population of 1080 million (97%) and full coverage is likely to be achieved by March 2006.

The RNTCP aims to detect at least 70% of new smear positive TB cases and cure at least 85% of them.

## Anti-TB treatment

RNTCP uses intermittent short-course chemotherapy regimens, as recommended by the World Health Organization, to reduce the treatment duration and facilitate direct observation.

Treatment is divided into two phases: intensive and continuation.

In India, the following schedule is followed:

- ◆ In the intensive phase (two to three months), each dose is administered three times a week, under direct observation.
- ◆ In the continuation phase (four to five months), at least the first of the three-times-a-week doses is administered under direct observation.

The treatment category and regimen depend on the type of patient.

Under the RNTCP, all sub-centres, primary health centres, community health centres, and other health facilities provide DOT services to patients. The progress of the patient is monitored through sputum microscopy. As TB patients may also seek treatment from private physicians, the government has taken initiatives to provide DOTS services through the private sector.

## Advantages of DOTS

- ◆ Accuracy of TB diagnosis is more than doubled.
- ◆ Treatment success rate is up to 95%.
- ◆ Prevents the spread of the tuberculosis bacillus, thus reducing the incidence and prevalence of TB.
- ◆ Helps alleviate poverty by saving lives, reducing duration of illness and preventing spread of infection.
- ◆ Improves quality of healthcare and removes stigma associated with TB.
- ◆ Prevents failure of treatment and the emergence of MDR-TB by ensuring patient adherence and uninterrupted drug supply.
- ◆ Lends credibility to TB control efforts.



Bringing back the smiles with DOTS



## Categorisation and Treatment Regimens under RNTCP

Category of treatment	Type of patient	Regimen*
Category I	New sputum smear-positive Seriously ill** new sputum smear-negative Seriously ill** new extra-pulmonary	2H <sub>3</sub> R <sub>3</sub> Z <sub>3</sub> E <sub>3</sub> + 4H <sub>3</sub> R <sub>3</sub>
Category II	Sputum smear-positive Relapse Sputum smear-positive Failure Sputum smear-positive Treatment After Default Others***	2H <sub>3</sub> R <sub>3</sub> Z <sub>3</sub> E <sub>3</sub> S <sub>3</sub> + 1H <sub>3</sub> R <sub>3</sub> Z <sub>3</sub> E <sub>3</sub> + 5H <sub>3</sub> R <sub>3</sub> E <sub>3</sub>
Category III	New Sputum smear-negative, not seriously ill New Extra-pulmonary, not seriously ill	2H <sub>3</sub> R <sub>3</sub> Z <sub>3</sub> + 4H <sub>3</sub> R <sub>3</sub>

\*The number before the letters refers to the number of months of treatment. The subscript after the letters refers to the number of doses per week. The dosage strengths are as follows: H: Isoniazid (600 mg), R: Rifampicin (450 mg), Z: Pyrazinamide (1500 mg), E: Ethambutol (1200 mg), S: Streptomycin (750 mg). Patients who weigh 60 kg or more receive additional Rifampicin 150 mg. Patients who are more than 50 years old receive Streptomycin 500 mg. Patients who weigh less than 30 kg receive drugs as per body weight. Patients in Categories I and II who have a positive sputum smear at the end of the initial intensive phase receive an additional month of intensive phase treatment.

\*\* Seriously ill also includes any patient, pulmonary or extra-pulmonary who is HIV-positive and declares his sero-status to the categorising/ treating medical officer (MO). For the purpose of categorisation, HIV testing should not be done

\*\*\* In rare and exceptional cases, patients who are sputum smear-negative or who have extra-pulmonary disease can have Relapse or Failure. This diagnosis in all such cases should always be made by an MO and should be supported by culture or histological evidence of current, active TB. In these cases, the patient should be categorised as 'Others' and given Category II treatment.

- ◆ Provides a model for strengthening health services.

The DOTS strategy, as implemented in India, already incorporates all components of the new STOP TB Strategy to be published by WHO in 2006. The RNTCP is already collaborating with the National AIDS Control Programme (NACP) to address TB-HIV and has developed guidelines for management of MDR-TB. By strengthening

laboratories and drug delivery systems, and by providing additional contractual staff, RNTCP continues to strengthen the general health system in the country. In the area of involvement of all care providers, public as well as private, RNTCP has been a global leader. Research done in India, especially at the TB Research Centre (TRC), Chennai, continues to drive policy decisions in RNTCP, and IEC is now an important part of the Programme.

“In the last few years India’s Revised National Tuberculosis Control Programme has made major contributions to the global increase in case detection under the DOTS strategy. The new Stop TB strategy, recommended by WHO, is an opportunity for India to consolidate the gains and address additional challenges, including MDR-TB.”

- Dr Mario Raviglione, Director, Stop-TB Department,  
WHO Headquarters, Geneva

## RNTCP: Implementation Status and Activities in 2005

“India has made remarkable progress in expanding the internationally recommended DOTS strategy to 97% of the country. The challenge is to sustain good quality services, widen the reach through involvement of wider network of healthcare providers, and deal with newer challenges posed by TB-HIV co-infection and drug resistance.”

Dr. S. J. Habayeb  
WHO Representative to India, January 2006

### RNTCP Phase II

The Revised National TB Control Programme (RNTCP) is built upon the infrastructure already established by the previous National Tuberculosis Programme (NTP), while incorporating the elements of the internationally recommended Directly Observed Treatment, Short course (DOTS) strategy.

Large-scale implementation of RNTCP began in 1997, with assistance from the World Bank. The initial five-year project plan was to be implemented in 102 districts of the country, and also to strengthen another 203 districts for introduction of the revised strategy at a later stage. In early 2002, the World Bank-assisted TB control project was extended for another two years, within the same budgetary provision, to cover a population of 700 million. The Government of India took up the challenge of nationwide expansion of RNTCP by the year 2005, before the next phase of the project began.

By the end of 2005, 97% of the country was covered by DOTS, and full coverage is aimed at by March 2006. After a phased expansion during the past eight years, RNTCP has reached very close to achieving the global targets of case detection and treatment success.

However, to have an impact on the epidemiology of TB, the Programme needs to maintain high case detection and success rates for decades to continue.

Phase II of the RNTCP is a step towards achieving the TB-related Millennium Development Goal (MDG) targets. The goal of the TB Control Programme is to decrease mortality and morbidity due to TB and cut transmission of TB. DOTS remains the core strategy. The second phase of the RNTCP will consolidate, maintain and further improve the achievements of the first phase. RNTCP II is expected to maintain at least 70% case detection rate of new smear positives and maintain a cure rate of at least 85%. It aims to further increase the access of services to marginalised groups in hard-to-reach areas through continuation of all activities of Phase I and with intensive monitoring, supervision and evaluation.

To provide standardised, good-quality service in a patient-friendly environment, the Programme will strengthen inter-sectoral collaboration, involve medical colleges and conduct need-based, focused and people-centric Information, Education and Communication (IEC) activities.

The new activities proposed in RNTCP are the scaling up of the State-level intermediate referral

laboratories (IRL) capacity for nation-wide implementation of external quality assessment (EQA) of sputum smear microscopy services and provision of culture and drug sensitivity testing. Implementation of DOTS-Plus for multi-drug resistant TB cases will occur in a phased manner, and procurement and distribution of paediatric drug boxes for improved care of paediatric cases will take place early 2006.

In view of the new and focussed on activities, institutional strengthening at national, State and district level is being taken up by RNTCP. The positions of TB-HIV coordinator, urban coordinator and communication facilitator have been introduced at State, district and sub-district levels.

In order to discuss new initiatives in RNTCP and also to obtain the commitment of the States to the Phase II plan, a meeting of Health Secretaries and Senior TB Officers was held at Neemrana in November 2005

### Financial resources

The first phase of the World Bank assisted RNTCP ended on 30 September 2005. The second phase of the project that has commenced on 1 October 2005 for a further period of five years is being assisted by the World Bank, and the Department for International Development (DFID). The total project cost is US\$ 256

million of which the World Bank assistance is US\$ 170 million and DFID assistance (via WHO) in the form of drugs for 500 million population is US\$ 63.7 million.

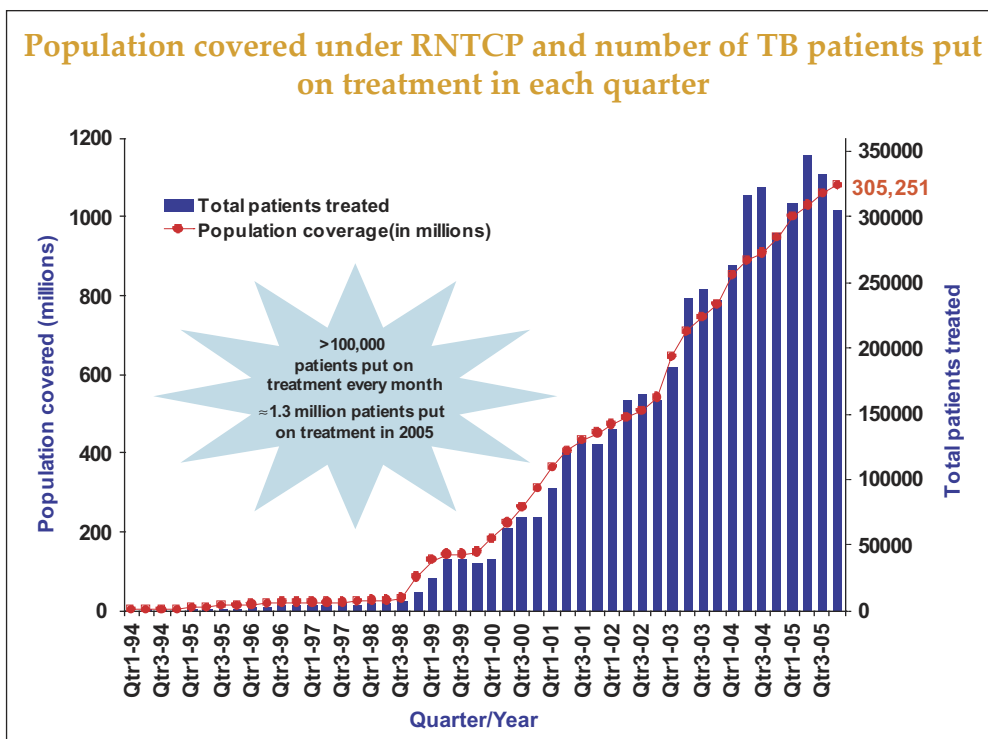
In addition, the RNTCP is supported by the Global TB Drug Facility (GDF), the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM) and the United States Agency for International Development (USAID). Danida had provided US\$ 14 million under Phase I to support RNTCP in the State of Orissa. In addition, US\$ 26 million was provided by DFID to cover the entire State of Andhra Pradesh. The GDF was providing anti-TB drugs for the State of Orissa, and also for an additional 200 million population as a commodity grant valued at over US\$ 2 million per year up to 2005. The GFATM is providing US\$ 8.6 million to cover a population of 56 million in the three States of Chhattisgarh, Jharkhand and Uttaranchal from the GFATM Round 1, US\$ 29 million to cover a population of 110 million in Bihar and Uttar Pradesh from Round 2, and US\$ 26 million to cover Andhra Pradesh and Orissa. USAID is providing grant assistance of US\$ 6.58 million over five years (up to 2007) for covering the entire 21 million population of Haryana.

The Government of India provides 100% grants-in-aid to the implementing agencies i.e. States/UTs besides free drugs. The States are expected



National meeting of Health Secretaries and State TB Officers at Neemrana, November 2005





to use the existing health infrastructure and it also provides some manpower resources.

## RNTCP activities in 2005

### RNTCP expansion status

In 2005, RNTCP covered an additional 132.8 million people in 69 districts. Almost the entire country (97%) had access to DOTS services by the end of 2005.

The States that achieved full coverage in 2005 were Jammu and Kashmir, Jharkhand, Tripura and Uttar Pradesh.

### Rapid scale-up of RNTCP coverage, 1998 through 2005

Year	Population Covered (millions)
1998	18
1999	130
2000	287
2001	450
2002	530
2003	778
2004	947
2005	1080

The Union Territories that were fully covered in 2005 under RNTCP were Andaman and Nicobar Islands, Dadra and Nagar Haveli, Daman and Diu and Lakshadweep.

Although the Andaman and Nicobar Islands were devastated by the tsunami in late 2004, they recovered enough in 2005 to provide facilities for TB patients by July 2005.

Jammu and Kashmir has the DOTS centre at the highest altitude at over 15,000 feet. The service delivery was started in the presence of the Hon'ble Minister of Health and Family Welfare, Dr Anbumani Ramadoss.

### Expansion of DOTS coverage in 2005

Period	Increase in coverage (millions)	Increase in districts (number)
Quarter 1	54.2	18
Quarter 2	28.8	14
Quarter 3	28.8	25
Quarter 4	21.0	12
<b>Total</b>	<b>132.8</b>	<b>69</b>

## Quality-assured diagnostic services

### Laboratory network

A nation-wide network of RNTCP quality assured designated sputum smear microscopy laboratories has been set up, providing appropriate, available, affordable and accessible diagnostic services for TB suspects and cases.



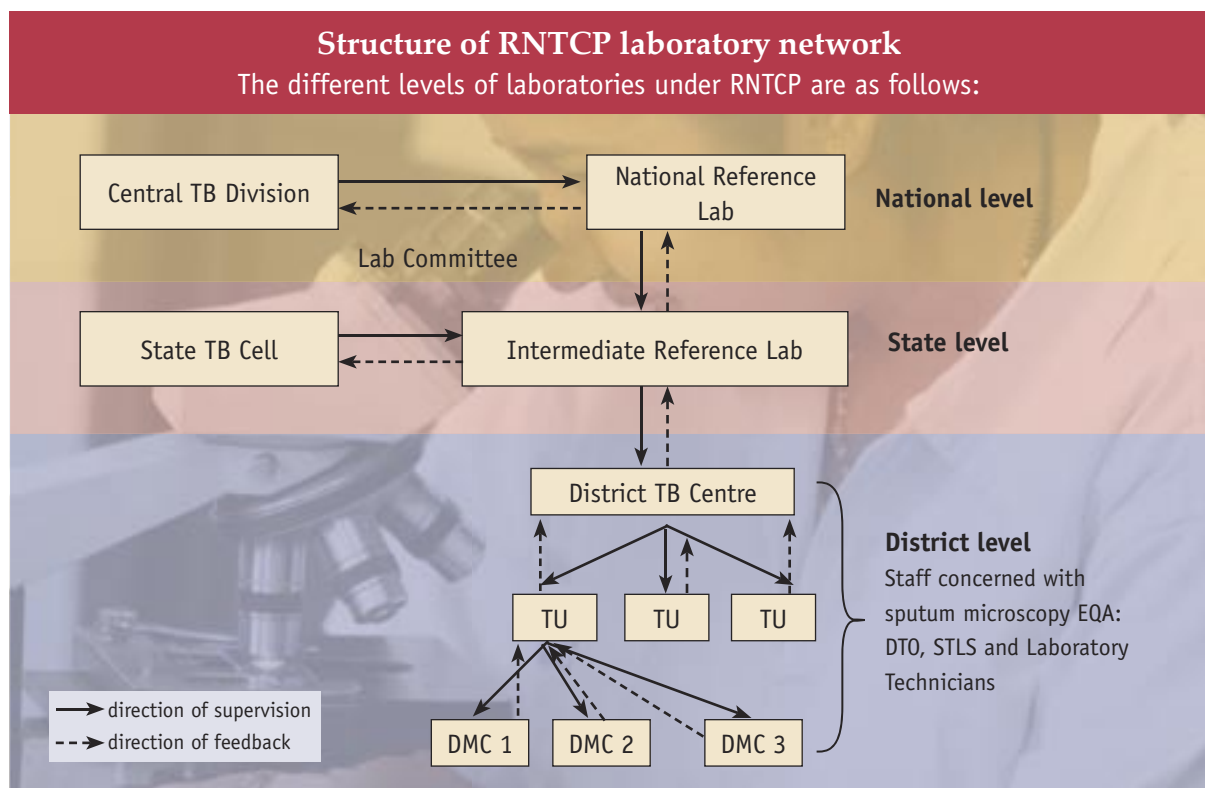
TRC Laboratory, Chennai

The cornerstone of the RNTCP is the DOTS strategy. One crucial activity for DOTS is to ensure access to quality-assured TB sputum microscopy for case detection among persons presenting with, or found through screening to have, symptoms of TB. This component of DOTS requires the presence of a network of quality laboratories in the country.

protocols for sputum microscopy and DRS have been prepared. A Central Laboratory Committee has been constituted with the microbiologists of the three National Reference Laboratories (NRLs), and Central TB Division (CTD) and WHO representatives as members. This committee works as a task force to guide laboratory-related activities of the Programme.

Under RNTCP, efforts have been made to consolidate the laboratory network into a well-organised one, with a defined hierarchy for carrying out sputum microscopy with External Quality Assessment (EQA), and Drug Resistance Surveillance (DRS) related activities. New

The laboratory network for RNTCP in India consists of three designated NRLs: Tuberculosis Research Centre, Chennai; National Tuberculosis Institute, Bangalore; and Lala Ram Sarup Institute of Tuberculosis and Allied Sciences, New Delhi.



It is planned to have 24 Intermediate Reference Laboratories (IRLs) at the State level, and more than 11,000 Designated Microscopy Centres (DMCs). A nodal laboratory in each State will be designated as the IRL. The State TB Training and Demonstration Centres (STDCs) will be designated as IRLs, if they have a well-functioning laboratory. Otherwise, the State is to identify a Public Health Laboratory or Medical College Laboratory and designate that as the IRL after the laboratory is assessed by a visit from the NRL.

The RNTCP-Designated Microscopy Centres in each district are the peripheral laboratories. A Designated Microscopy Centre is established for approximately 100,000 population (50,000 in tribal and mountainous areas). Each DMC has a trained laboratory technician, upgraded laboratory facilities, binocular microscope and laboratory consumables. RNTCP has accorded high priority to ensuring the quality of sputum smear microscopy services in order to achieve the objectives of the RNTCP.

### Role of each level of laboratory under sputum microscopy EQA

**National Reference Laboratory** Each of the three National Reference Laboratories supervises sputum microscopy EQA of 8-11 States designated under them. The NRLs are accredited laboratories as their EQA is being performed by a WHO supra-national laboratory in relation to anti-TB drug sensitivity testing.

**Intermediate Reference Laboratory** The designated IRL conducts sputum microscopy EQA for the State and occasionally for a neighbouring State or Union Territory. The IRL ensures proficiency of RNTCP staff for carrying out good quality diagnosis by providing technical training to district and sub-district technicians and Senior TB Laboratory Supervisors (STLSs). It undertakes on-site evaluation visits and panel testing of each District Tuberculosis Centre (DTC) in the State at least once a year. The IRL manufactures slides for panel testing of the district staff. It undergoes accreditation for both EQA and drug sensitivity testing (DST) by the concerned NRL or by both the NRL, and the WHO supra-national laboratory, as decided by the Central TB Division.

**District TB Centre** The District TB Officer (DTO) manages all activities concerned with EQA, especially blinded re-checking of smears. Logistics of maintaining good quality reagents and equipment at all units in the district is the responsibility of the DTO. At the DTC, all reports from the sub-districts are consolidated and sent to the IRL.

**TB Unit** The STLS carries out on-site evaluations and blinded re-checkings as part of his/her supervisory activities. (A TB unit is established at the sub-district level at the rate of one per 500,000 population [one per 250,000 population in tribal and hilly areas]).

The RNTCP plans to utilise the State health infrastructure optimally to provide affordable and quality-assured microscopic services. The objective of implementing sputum microscopy EQA in the laboratory network is to have an in-built routine system for sputum microscopy EQA, for supervision and monitoring of the diagnostic systems by the STLS locally and by the intermediate (State-level) and national laboratory network for RNTCP at the higher levels.

Under the new RNTCP EQA protocol, the role of each level of laboratory – National Reference Laboratory, Intermediate Reference Laboratory and Peripheral Laboratory – has been clearly defined. The sputum microscopy activities will consist of three evaluation activities by these laboratories: on-site evaluation, panel testing and blinded re-checking of routine slides.

### Status of State Training and Demonstration Centres (STDCs)

One of the primary objectives of the RNTCP Phase I was to decentralise implementation and monitoring of the programme to the State in a phased manner. In this scenario it became pertinent that the STDCs are strengthened to increase their capacity to assist the State TB Cell (STC) in training, monitoring, supervision and advocacy. They would play the role of the technical reference point in the State for TB control. A review of STDCs was conducted by Central TB Division in 2001-02 and it was observed that though STDCs had adopted RNTCP guidelines all of these were not strengthened enough to provide technical support to State TB Officer (STO)/STC as envisaged. One of the reasons contributing to the situation was non-availability of standardised guidelines, for the role STDCs would need to play in RNTCP. The 2003 GoI-WHO Joint Monitoring Mission of RNTCP also called for strengthening of STDCs as a step towards capacity building of the States for effective implementation of RNTCP related activities. Accordingly, the STDC guidelines for RNTCP were formulated in 2003 and States were advised to identify STDCs along with Intermediate Reference Labs (IRLs).

The following list gives the details of various State level Institutes/Laboratories identified as STDC/IRL (status as on Dec. 2005):

State	Name of the institutions where the lab is identified/ functional	Whether undertaking EQA supervision
Andhra Pradesh	STDC Hyderabad	Yes
Arunachal Pradesh	STDC Naharlagun	No
Assam	Guwahati Medical College Hospital, Guwahati – Yet to start activities	No
Bihar	STDC, Patna	No
Chhattisgarh	New STDC being constructed at Raipur	No
Delhi	New Delhi TB Centre	No
Gujarat	STDC Ahmedabad	Yes
Goa	GMC Bambolim (proposed for IRL)	No
Haryana	PHL Karnal	Yes
Himachal Pradesh	TB Hospital, Dharampur	No
Jammu (J&K)	STDC Srinagar (Pending approval)	No
Kashmir (J&K)	STDC Srinagar	Yes
Jharkhand	Itki TB Sanatorium	Yes
Karnataka	STDC Bangalore	Yes
Kerala	STDC, Thiruvananthapuram	Yes
Madhya Pradesh	STDC Bhopal	Yes
Maharashtra	STDC Nagpur	Yes
Orissa	STDC, Cuttack	Yes
Pondicherry	STDC Pondicherry	No
Punjab	STDC Patiala, Government Medical College, Patiala	Yes
Rajasthan	STDC Ajmer	Yes
Sikkim	IRL proposed at Gangtok	Yes
Tamil Nadu	Institute of Thoracic Medicine, Chennai, proposed	No
Uttar Pradesh	STDC Agra. Additionally, Dept. of Microbiology, KGMU, Lucknow, under process for agreement	No
Uttaranchal	New STDC proposed in Dehradun	No
West Bengal	STDC Kolkata	Yes



DDGTB interacting onsite with State Officials for setting up of IRL in Tamil Nadu, December 2005

These institutes are currently at varying levels of functionality. Strengthening in terms of staff, infrastructure and processes are still underway in a vast majority of STDCs. Crucial posts of Microbiologist and Epidemiologist are yet to be filled in many States. Currently, the programme is stressing to the State governments the need to bring up the capacity of these institutes so that they can in future be developed as culture and DST labs, and can undertake the role of accredited lab for DOTS-Plus in the States.

### **Drug resistance surveillance (DRS) under RNTCP**

The prevalence of drug resistance to TB can be taken as an indicator of the effectiveness of the TB control activities over a period of time, and therefore RNTCP has taken steps to measure this important indicator.

The aim of DRS is to determine the prevalence of anti-mycobacterial drug resistance among new sputum smear positive pulmonary tuberculosis (PTB) patients and also among previously treated sputum smear positive PTB patients. Drug-

resistant TB has frequently been encountered in India and its presence has been known virtually from the time anti-TB drugs were introduced for the treatment of TB.

Since the available data represents only a small area of the country, there is a need for continuous surveying of drug resistance by a network of investigators in different regions of the country.

A new protocol for State-wide DRS under RNTCP has been developed in 2005. Over the next five years, RNTCP plans to systematically carry out State-wide DRS surveys in the States of Andhra Pradesh, Delhi, Gujarat, Kerala, Maharashtra, Orissa, Uttar Pradesh and West Bengal. This will cover almost 54% of the population of the country under evaluation of prevalence of drug resistance. Another survey would be carried out in the same States, using the same methodology, at the end of the five-year period. Besides this, the Indian Council of Medical Research (ICMR) would be undertaking separate DRS in the States of Tamil Nadu and Sikkim. By 2010, there will be a network of about 24 quality-assured and accredited State-level culture and drug sensitivity testing laboratories. Drug resistance surveillance surveys will have been completed in a total of eight States, with two rounds having been completed in four States.

The State-wide DRS survey protocols for Maharashtra and Gujarat have been finalised. The piloting of the study was conducted successfully in July-August 2005 in Gujarat and in September 2005 in Maharashtra. The DRS surveys were subsequently started in August 2005 in Gujarat and in November 2005 in Maharashtra.

### **Monitoring and evaluation**

#### **Supervision and monitoring strategy**

The Revised National Tuberculosis Control Programme started in India in 1997, and has shown a rapid rate of expansion whilst maintaining the quality of services.





Strategy document for Supervision and Monitoring developed by RNTCP in March 2005

RNTCP is a difficult Programme to implement and manage, both from the technical and programmatic viewpoints, in a large country like India. It has relatively complex diagnostic, treatment and follow-up dimensions, especially when all these activities are to be supervised and monitored, and the staff held accountable for its provision.

As a large number of districts have started implementation of the Programme in recent years, it is crucial that proper systems are not only put into place at the outset but also that these systems ensure that good quality services continue to be provided on a sustainable basis in the coming years. At the same time, it is important to monitor the districts which have been implementing for a few years, so as to ensure that wrong practices and laxity do not set in.

A 'Strategy Document on Supervision and Monitoring of RNTCP' has been introduced from early 2005. The document provides detailed guidelines on activities to be conducted by the Programme managers and supervisory staff; has an exhaustive list of monitoring indicators for assessment of Programme performance from the most peripheral health institution to the national level – to assess the political and administrative commitment, human resource, diagnostic and

treatment services, drug, logistic and financial management, TB-HIV, IEC, supervision and recording and reporting. The document also provides Programme review checklists for Health Secretaries, District Magistrates and Chief District Health officers.

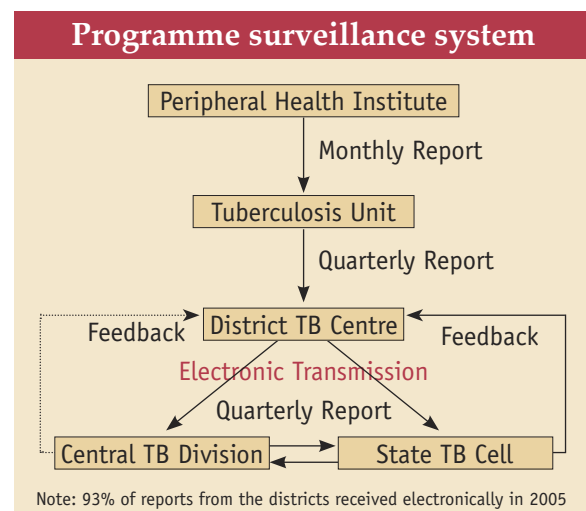
A Central Monitoring Unit led by Chief Medical Officer (TB) and supported by WHO consultants has been established for supervision, monitoring and surveillance of TB control activities in the country. The unit also oversees the implementation of this strategy in the States and districts.

At the State level, the full staff complement of the State TB Cell (STC) as laid down in the Programme guidelines, needs to be in place. Provisions have been made to strengthen the monitoring activities within a State by provision of adequate mobility at the STDC and at the STC.

In RNTCP Phase II, in addition to the existing contractual staff (STS, STLS and proportion of LT and MOs), additional staff have been provided such as urban coordinators, TB-HIV coordinators and microbiologists.

### Recording and reporting and the surveillance system

RNTCP has a robust recording and reporting system that has been in use since the start of the Programme. The system allows for systematic



Programme Surveillance System of RNTCP Information System

cohort analysis of case detection, sputum conversion and treatment outcomes. To further strengthen the surveillance system, the RNTCP treatment cards, laboratory registers, TB registers and quarterly reporting formats have been recently modified, and a few additional records have been added to document referrals for treatment after diagnosis, quality of DOTS implementation and External Quality Assessment (EQA) protocol for sputum smear microscopy. These new and revised reporting formats have been in use since the first quarter of 2005.

### Electronic transmission of data

The quarterly reports are prepared at the sub-district Tuberculosis Unit (TU) level and sent to the district level. At the district level, each district has been provided by RNTCP with a computer and a data entry operator. The TU reports are entered into the computer at the district and the collated district quarterly reports are emailed to the Central TB Division (CTD), with a copy to the State TB Officer (STO). At the national level, a quarterly and annual performance report is generated with State and District-wise performance indicators, which is placed on the Programme website ([www.tbcindia.org](http://www.tbcindia.org)). This system of electronic transmission of data using the Epicentre software package, has been a key factor in the timely analysis of data at the national level. This system will be continued with possible software updates.

A user-friendly Windows-based version of Epicentre is being developed, and will be field-tested and operationalised in 2006.

### Process of monitoring

Broadly, the Programme implementation and performance can be monitored through analysis and feedback on routine surveillance data, supervisory visits, review meetings at various levels and Programme evaluation by different agencies. Measurable indicators for quality control, Programme outcomes and operational effectiveness are the basis for Programme monitoring.

1. Analysis and feedback on routine surveillance data: Surveillance data are received through quarterly reports. A correctly compiled quarterly report gives ground level information on the performance of the Programme. The State TB Officers/Medical Officers – STC analyse the district-level quarterly reports and provide feedback to the respective districts within the State. Till date 22 States/Union Territories have been formally trained in monitoring and they are routinely analysing the quarterly reports and sending feedback. CTD reviews the States' feedback and sends commentary on the quality of States feedback.
2. Supervisory visits and feedback: RNTCP lays out clear responsibilities to the respective staff at all levels in relation to supervisory visits. A supervisory register is being maintained at all health institutions (implemented in 15 States) for recording the findings of field visits and recommendations by the supervisory staff. The register facilitates monitoring the follow-up actions taken by the institution/staff.



DDGTB interacting with STS in Tiruvallur district, Tamil Nadu, December 2005

3. Review meetings: There is already an in-built system in RNTCP for periodic review of the Programme implementation activities at all levels. Quarterly review meetings are held at the State-level. Bi-annual review meetings of State TB Officers are held at the national level to discuss progress and performance



National Review Meeting of the STOs at Kolkata, May 2005

indicators. One such meeting was held at Kolkata in May 2005 and another at Manesar in December 2005.

4. Periodic in-depth evaluations: Information and action points generated through periodic evaluations are an important tool for evaluation of the Programme. RNTCP has already a system for such evaluation. States are expected to conduct internal evaluation of two districts per quarter.

Seven centrally driven internal evaluations were carried out in 2005, two in Uttar Pradesh, and one each in Andhra Pradesh, Karnataka, Madhya Pradesh, Orissa and Tamil Nadu.

It was found that where the DTO was technically and administratively strong, the Programme showed an improvement and the data reflected ground realities.

Instances of strong commitment were seen in Andhra Pradesh and Karnataka where STOs are trying their level best to improve the Programme in spite of the many limitations.

In the course of these evaluations, the strengths of the Programme were identified such as the organisation of DOT through community volunteers.

More than 95 State-conducted internal evaluations were carried out in 2005. These evaluations have

been good learning experiences for DTOs of other districts as sharing of experiences and ideas have contributed to improvements.

Intensive monitoring was conducted in 25 select districts which has resulted in fruitful interactions in the review meetings. These forums have provided an opportunity to convey important messages to all States and districts as well as strengthen basic systems for further improvement of the Programme.

## Human Resource Development

Crucial to the implementation of the supervision and monitoring strategy is the preparation of a human resource development (HRD) plan at the Central, State and District levels. Efforts have been made to strengthen the human resource capacity at Central and State levels, both in terms of numbers and skill level.

### Objective

The objective of the HRD initiative of the RNTCP is to have adequate staff, who have the skills, knowledge and attitudes necessary to successfully implement and sustain TB control activities based on the DOTS strategy, including the implementation of new and revised strategies and tools available at all times at all levels of the health system.

### Training and re-training

The Programme has an overall HRD plan, of which training is the overriding component, to address the issue of maintaining adequate manpower to



Training programme in Bhavnagar, Gujarat

carry out Programme activities with proficiency and efficiency.

The RNTCP provides for training of all levels of its staff.

1. Induction training: This covers all new staff and also replacement staff, following staff turnover. It includes the initial training of NGOs and private medical practitioners on RNTCP, as well as basic modular training for Medical Officers, Senior Treatment Supervisor (STS), Senior TB Laboratory Supervisor (STLS), Laboratory Technicians (LTs) and Multipurpose Workers (MPWs).
2. Re-training: These trainings are mainly for staff who, during supervision activities, have been identified for re-training on basic RNTCP activities. Re-training is needs-based, and covers the complete set of initial training modules, or only specific sections. As experience is gained by the Programme from need-based assessment activities during supervision, generic areas of re-training may be identified.
3. Updates on new activities and initiatives: As the RNTCP introduces new activities and initiatives, it is important that the field staff is updated on these areas. These updates could be given mainly by utilising time during the routine Programme review meetings such as the monthly District level meeting of the DTO, MO-TCs, STSs and STLSs, or the quarterly State level review meetings.

The focus now is to improve existing training programmes, identify performance deficiencies and plan re-training and regular updates.

Identifying new personnel for training, inclusion of RNTCP in the curricula for undergraduates and postgraduates of medical and paramedical courses and co-ordination of training with other disease control interventions like HIV/AIDS, are some of the key areas warranting attention.

4. TB-HIV training: A two-day modular training programme is being undertaken for District TB Officers in 14 States implementing TB-HIV Joint Action Plan. The States are Andhra Pradesh, Delhi, Gujarat, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Manipur, Nagaland, Orissa, Punjab, Rajasthan, Tamil Nadu and West Bengal.
5. The DTOs are being trained as Master Trainers for which training programmes on TB-HIV co-infection are organised by the Central level. These Master Trainers then organise training for all RNTCP staff in the district. The modules for TB-HIV have been developed for training of MOs, STSs and STLSs.

India is the first country in the SEARO region to have modules for training in TB-HIV. Training of Master Trainers have been organised in the States of Andhra Pradesh, Gujarat, Karnataka, Manipur, Nagaland and West Bengal.

### **Institutional strengthening**

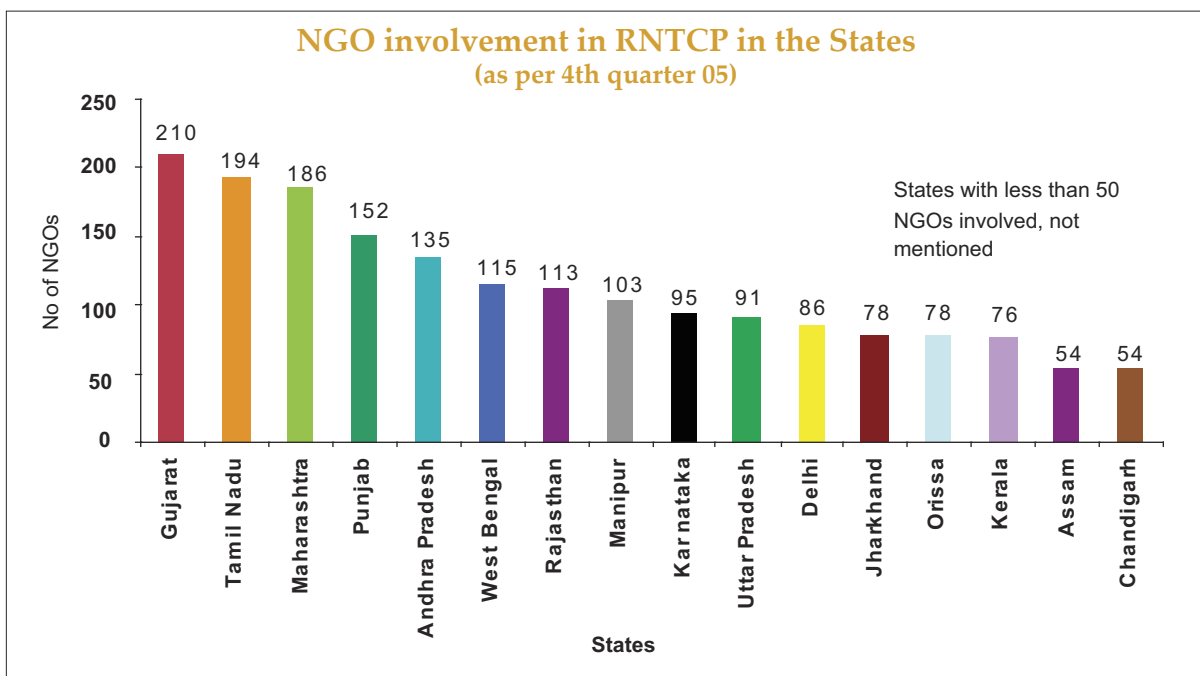
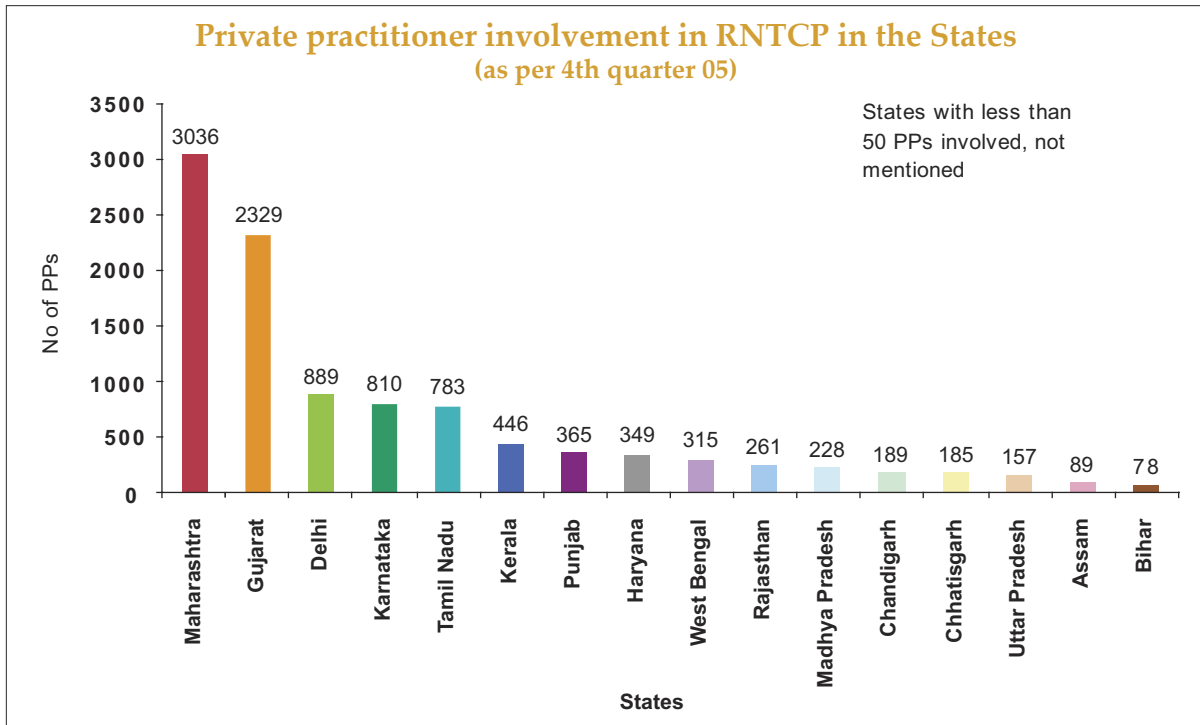
The system for follow-up includes plans for strengthening of the basic initial training programmes, managing finances for HRD, implementing and monitoring the plan and evaluating and revising implementation for sustainability. Therefore, all health personnel involved in the implementation of RNTCP need to be trained.

Training for such a large number of staff cannot be imparted by the three Central Institutes alone and has been decentralised to the State and District levels. For this purpose, training facilities available at State, District and sub-District levels have been strengthened. This necessitates a systematic approach for the development of training facilities at all levels. It is necessary that training imparted to different categories of personnel at various levels is appropriate to their skills and the requirements of the Programme. Hence, trainers of the highest standards must be constantly available to enhance the quality of training.

### Partnership with other sectors

Public-Private Mix (PPM) has been defined by the WHO as ‘strategies that link all entities within the private and public sectors (including health providers in other government ministries) to the national TB programme for DOTS expansion’.

The public-private collaborations in RNTCP resulted in the emergence of many interesting models of PPM in TB control. These models have contributed to the TB control activities and also helped in policy-making at the national level.



### NGOs

Based on RNTCP's experience with NGOs, guidelines have been developed that provide five different schemes of financial and/or commodity assistance to the NGOs interested in collaborating with RNTCP. Presently more than 1,800 NGOs are providing services as per the RNTCP guidelines. The bigger NGOs like Indian Medical Association (IMA) and mission hospital associations are collaborating with RNTCP at national and State levels, in addition to the local collaborations.



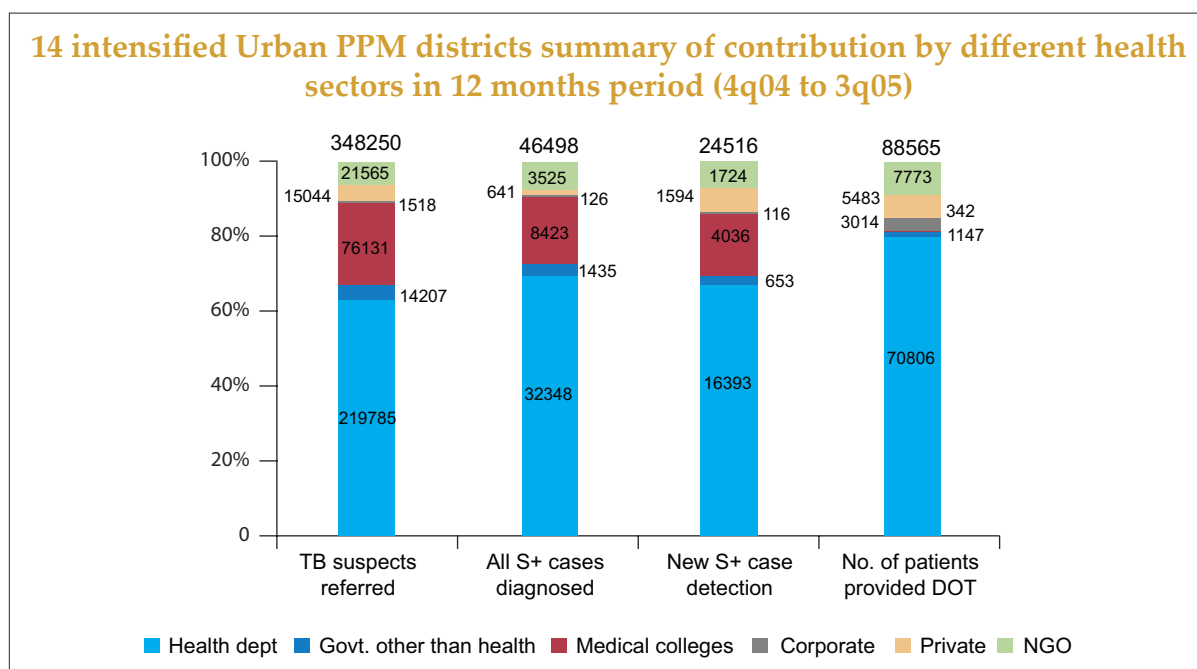
IMA Meeting in Hyderabad, Andhra Pradesh, September 2005

The Central TB Division has started four Urban DOT projects in Hyderabad, Indore, Mumbai and Varanasi which have large numbers of slum dwellers and migrant population. The four project sites will establish model "Urban TB Control Projects" by improving the quality and reach of RNTCP to special groups like slum dwellers and migrants, through more "patient-friendly" treatment observation, involvement of private and NGO sectors and IEC. Thus, they will increase the reach of RNTCP by making DOTS more accessible and acceptable among disadvantaged urban poor population.

Government Health Services and the Ministries of Defence, Steel, Coal, Mines, Petroleum and Natural Gas, Shipping, Power, Chemicals and Fertilizers have directed their respective health facilities to adopt the DOTS strategy and become involved in RNTCP. The Indian Railways is initiating more than 70% of its patients on DOTS in Andhra Pradesh, Gujarat, Jharkhand, Orissa and West Bengal. All 22 ESI centrally owned hospitals are involved in the RNTCP. The Port Trust hospitals at Chennai, Cochin, Haldia, Marmagoa, Mumbai, Paradip and Vishakhapatnam are involved in the RNTCP. The Central Government Health Services has issued a memorandum to all its Additional Directors to stop procuring anti-TB drugs and adopt the DOTS strategy for all TB patients.

### Health sectors of other Government departments

The Employees' State Insurance (ESI) Corporation, the Indian Railways, the Central



Major milestones of RNTCP-PPM DOTS	
Year	
1993	RNTCP pilots started
1995	PPM model started in Hyderabad
1997	National consensus conference of medical colleges
1998	RNTCP scaling up initiated
2000-2003	PPM models in Delhi, Kannur, Kollam, Mumbai, tea gardens of north-east started
2001	RNTCP schemes for involvement of NGOs published
2002	RNTCP schemes for Private Practitioners (PP) published
2002	National workshop of medical colleges: seven RNTCP nodal centres identified
2002-2003	PPM activities initiated in many districts
2003	Intensified PPM scaling up begins in 12 urban sites
2003-2004	Central initiatives to involve other government departments, public sector enterprises, corporate sector and national NGOs
2004	Declaration of Indian Medical Association to support RNTCP
Dec 2005	1080 million population covered by RNTCP. More than 200 medical colleges, 2000 NGOs, 10,000 private practitioners and more than 100 corporate houses are involved in RNTCP. Intensified PPM scale up in 70 districts.

### Corporate sector

The Central TB Division has also actively interacted with the management of large corporate houses and advocated for their involvement in RNTCP activities. More than 100 corporate sector units, such as a sugar mill in Uttar Pradesh and tea gardens in the north-east and West Bengal, are now involved in RNTCP. Hospitals in the tea gardens of Jalpaiguri (West Bengal) and

Dibrugarh (Assam) are involved as Designated Microscopy Centres. In 2005, 44% of the new smear positive cases in Dibrugarh (Assam) and 39% of those in Jalpaiguri (West Bengal) were detected by these tea estate hospitals. Coal India has a TB Unit in Burdwan (West Bengal). The National Thermal Power Corporation (NTPC) and Bharat Heavy Electricals Limited (BHEL) run Designated Microscopy Centres. Corporate sector

BHEL located in Bhopal, Madhya Pradesh covers a population of 300-400,000. It has one multi speciality hospital and six dispensaries. The DMC was established in the hospital-Kastoorba hospital on March 24, 2000. The new adult OPD of the hospital is 700 patients/day and out of these new adult OPD in the department of Pulmonary medicine is 30 patients/day. The patients referred for sputum microscopy to the DMC are from the department of Chest diseases, Paediatrics, Gynaecology, Surgery and Neurosurgery. The staff of RNTCP at the DMC includes two MOs (trained in RNTCP), one LT [contractual] and one TB Health Visitor (TBHV) [contractual].

The contribution of this hospital in RNTCP to the total district achievements from 01Q05 to 03Q05 has been as follows:

Contribution to RNTCP	01Q05	02Q05	03Q05
Contribution to Case Detection	4.5%	4.6%	5.2%
Contribution to Case Diagnosis	4.7%	4.6%	6.1%
Contribution to DOT provision	4.6%	7.1%	5.7%

The DMC-cum-DOT centre provides services free of cost to the population of BHEL as well as 1.5 lakh population of slum areas surrounding it (Anandnagar, Annangar, Patelnagar).

associations like the Confederation of Indian Industry (CII) and the Federation of Indian Chambers of Commerce and Industry (FICCI) have shown interest in RNTCP.

The CTD has developed guidelines for the involvement of private practitioners where different schemes are offered for collaboration. At present more than 10,000 private practitioners are involved in the RNTCP.

### Involvement of medical colleges

The RNTCP aims to make DOTS the standard of care for TB patients in all medical colleges and their hospitals. Medical colleges play a critical role in TB control in terms of the sheer number of TB patients they treat, their standing in the community as opinion leaders and trendsetters, and their role in imparting knowledge and skills to medical students and other practitioners. Thus, there is a pressing need for all medical colleges to advocate the RNTCP and the DOTS strategy, and through this strategy, provide the best opportunity for cure to patients. It is expected that professors of medicine will influence the private healthcare sector and the future generation of physicians in making DOTS the standard of management for TB patients in the country. This will ensure that all TB patients, irrespective of where they seek care, receive the best available care, free of cost.

Several issues need to be streamlined and improved upon in the coming years to make this partnership between the RNTCP and the medical colleges a truly effective collaboration. One key area is the need to ensure that all clinical departments of the colleges, in addition to those departments that run the DOTS centres, are involved and manage their TB patients as per the RNTCP guidelines.

Activities for medical colleges involve the following:

- ◆ Training/teaching of RNTCP among faculty members, undergraduates and postgraduates, residents, interns, and paramedical staff (laboratory technicians and nursing staff);



National Task Force meeting at All India Institute of Medical Sciences, New Delhi, November 2005

- ◆ Establishing microscopy and DOT centres in all medical colleges, strengthening infrastructure of the laboratory where required and involvement in the EQA of the smear microscopy network;
- ◆ Advocacy of RNTCP by sensitisation and training through the Indian Medical Association and other professional bodies, by workshops and continuing medical education (CME) programmes for medical colleges and the private sector, by use of newsletters, the press and other media to spread the RNTCP message to a wider audience; and
- ◆ Conducting operational research on topics relevant to the RNTCP, to improve DOT services, appropriate studies to aid the further development of consensus and guidelines for the diagnosis and management of extra pulmonary forms of TB, management of multi-drug resistant TB, treatment outcomes of hospitalised patients and diagnosis and management of HIV-infected TB patients.

As of December 2005, RNTCP core committees have been formed in over 180 medical colleges across the country. Presently, over 200 medical colleges are participating in the Programme. A vast majority of medical colleges in the country have already established an RNTCP microscopy/treatment centre in their respective institutions.

For effective implementation of the Programme in medical colleges, Task Forces have been





Meeting of Medical College Zonal Task Force (west) in Indore, December 2005



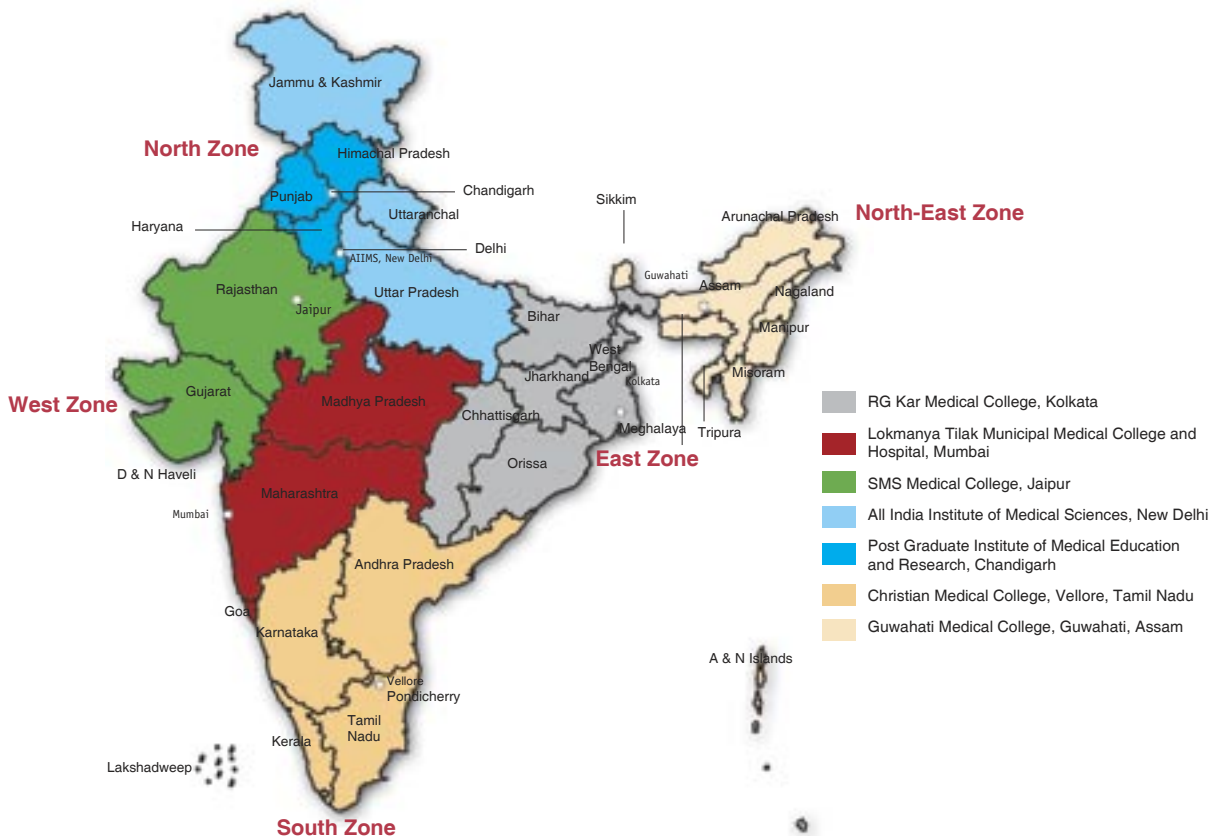
Group work during the Zonal Task Force Meeting, CMC, Vellore, October 2005

constituted at the National, Zonal and State level. The State Task Forces are to be formed in all States and Union Territories with medical colleges. Already State Task Forces exist in 26 of these, and are expected to be formally constituted soon in Pondicherry and Meghalaya, where these are yet to be formed. Zonal Task Forces have been constituted in five zones of the country, catering to States and Union Territories in the northern, southern, eastern, western and north-eastern zones. All the

five zones have had highly successful and well-attended zonal workshops during 2005.

RNTCP has established seven nodal centres for medical college involvement across the country, at AIIMS (New Delhi), PGI (Chandigarh), SMS Medical College (Jaipur), LTM Medical College (Mumbai), Guwahati Medical College (Guwahati), CMC (Vellore) and R G Kar Medical College (Kolkata), which are actively involved in the Zonal

### Medical colleges designated as RNTCP nodal centres



Task Forces and in the National Task Force. The National Task Force under the leadership of the All India Institute of Medical Sciences (AIIMS), New Delhi, recently concluded the fourth National Task Force workshop and a national-level Continuing Medical Education programme on RNTCP from 3 to 5 November 2005. The NTF has recommended the adoption of quarterly reporting formats for Medical Colleges, based on the draft formats which have been piloted this year in Gujarat, Maharashtra and Tamil Nadu. These reporting formats are being implemented nationally from January 2006. A six-hour sensitisation curriculum for medical college faculty was also finalised and adopted by the NTF. The results of a Referral for Treatment pilot were discussed. NTF recommendations, based on this, have been finalised for ensuring that this mechanism is in place in all medical colleges from 1 January 2006.

Over 100 faculty members from a large number of medical colleges have been nominated for training at National Level Institutes as Master Trainers, and these trained resource persons are themselves involved in training other faculty members and in their sensitisation. The standardised sensitisation material is being finalised based on the curriculum approved in the NTF, and the process of sensitisation of medical college faculty is expected to receive a further boost with this material being available at all medical colleges.

### Paediatric TB

To address the concern expressed by paediatric experts about the diagnosis and treatment



Paediatric patient-wise box

practices for paediatric patients under RNTCP, in 2003 a consultation of national and international experts on paediatrics and TB culminated in a national workshop on the 'Management of Paediatric TB under RNTCP'. This workshop resulted in modification of the existing RNTCP guidelines for the diagnosis and treatment of paediatric patients which were approved by all parties, including representatives of the TB Chapter of the Indian Academy of Paediatrics (IAP). A joint IAP-RNTCP committee was constituted after the workshop to address pending issues and follow up on the recommendations from the Delhi consensus workshop. A major recommendation from the workshop was that the drugs for paediatric TB cases under RNTCP should be supplied in patient-wise boxes (PWBs), similar to those supplied for adult patients. Development work on the paediatric PWBs has now been completed. Treatment will be based on the child's body weight and there will be two generic paediatric PWBs – one for the 6-10 kg weight band and the second for the 11-17 kg weight band. It is planned to make these paediatric PWBs available for use in the Programme from early 2006. This again will be a global first for the RNTCP, as no other DOTS programme in the world has such PWBs for the treatment of children with TB. Children weighing less than six kg will be treated with loose anti-TB drugs.

### DOTS-Plus

DOTS-Plus, conceived by the WHO and several of its partners, is a strategy currently under development for the management of multi-drug resistant TB (MDR-TB). The RNTCP views the treatment of MDR-TB patients as a 'standard of care' issue. Recognising that the treatment of MDR-TB cases is very complex, treatment will follow the internationally recommended DOTS-Plus guidelines and will be done in designated RNTCP DOTS-Plus sites. These sites will be in a limited number of highly specialised centres, at least one in each State, which will have ready access to an RNTCP accredited culture and drug susceptibility testing (DST) laboratory. There will be systems in place to deliver ambulatory

DOT after an initial short period of in-patient care to stabilise the patient on the second-line drug regimen, with a logistics system and standardised information system in place. The DOTS-Plus sites will be initiated in a phased manner, similar to that for the establishment of the culture and DST laboratory network, and sites will be linked geographically to the establishment of the RNTCP accredited IRLs. It is planned to enrol the first 100 cases in late 2006 in the two States of Gujarat and Maharashtra. Under RNTCP Phase II, it is planned to have a network of DOTS-Plus sites, as per international guidelines, capable of enrolling and providing care and management for up to 5,000 'new' multi-drug resistant tuberculosis (MDR-TB) cases a year.

It needs to be recognised that the diagnosis of MDR-TB is laboratory-based. To provide treatment services for MDR-TB patients, the RNTCP is establishing a network of State-level quality-assured culture and DST laboratories. The RNTCP aims to have one such laboratory for culture and DST in each large State by 2009-2010. Any laboratory that is to be a part of this network will need to undergo an assessment and accreditation process. This requires a planned and phased programme of capacity building of such a culture and DST laboratory network.

### TB-HIV co-ordination

HIV infection makes an individual more prone to develop TB disease. The HIV epidemic has the potential to worsen the TB situation because HIV increases the risk of disease re-activation in people with latent TB infection.

HIV is the most powerful risk factor for the progression of TB infection to TB disease. This is substantiated by the fact that an HIV-positive TB infected person has a 50-60% lifetime risk of developing TB disease as compared to an HIV-negative TB infected person who has a 10% lifetime risk of developing TB disease.



National level TB-HIV Coordination Meeting, October 2005

### Joint Action Plan

RNTCP and the National AIDS Control Organisation (NACO) have devised a Joint Action Plan for TB-HIV co-ordination. The objective of TB-HIV co-ordination is to reduce TB-associated morbidity and mortality in People Living With HIV/AIDS (PLWHA) through collaboration between NACP and RNTCP. The basic purpose of the Joint Action Plan is to ensure optimum synergy between the two National Programmes for effective prevention and control of both the diseases. During Phase I of the co-ordination, which was launched in 2001, activities were initiated in the six high HIV-prevalence States – Andhra Pradesh, Karnataka, Maharashtra, Manipur, Nagaland, and Tamil Nadu. In 2003, Phase II of the co-ordination saw activities being extended to eight additional States – Delhi, Gujarat, Himachal Pradesh, Kerala, Orissa, Punjab, Rajasthan and West Bengal. The immediate priority of the activities is to consolidate in the 14 States by firmly establishing the co-ordination in the Voluntary Counselling and Testing Centre (VCTC)-RNTCP cross-referral mechanism – pilot-tested in Maharashtra – in these States. The co-ordination shall be extended to the other States in the entire country in due course.

### Areas of focus

The TB-HIV co-ordination effort focusses on:

- ◆ Sensitisation of key policy makers to address the importance of TB-HIV co-ordination;
- ◆ Co-ordination of service delivery and cross-referrals;
- ◆ A joint training programme for service providers involved in RNTCP and NACP;

- ◆ VCTC-RNTCP co-ordination for cross-referrals;
- ◆ Optimal and comprehensive use of the community outreach of both Programmes through sensitisation and involvement of NGOs, CBOs and private practitioners;
- ◆ Use of universal precautions to prevent the spread of TB in facilities caring for HIV-infected persons, and to prevent the spread of HIV through safe injection practices in the RNTCP; and
- ◆ Joint efforts at IEC and at establishing a monitoring and evaluation system at District, State and National levels to assess the co-ordination and treatment services for People living with HIV/AIDS.

### Current scenario

Initial sensitisation of key policy-makers has been completed in the Phase I States. India is one of the first countries in SEARO region to come out with standardised Joint TB-HIV Modules, training on which has been initiated. Co-ordination and cross-referral linkages have been established in VCTCs of the six Phase I States and are being scaled up in the additional eight Phase II States. Activities on IEC have been taken up jointly in all these States, as a result of which nearly 300,000 VCTC clients have received information on TB. State and District level co-ordination committees have been formed and are already functional in Maharashtra and Manipur. Andhra Pradesh, Nagaland, Rajasthan and Tamil Nadu have formed State Co-ordination Committees. HIV surveillance in TB patients was conducted by NACO in collaboration with RNTCP, in one district in each of the four high-prevalence States of Andhra Pradesh, Karnataka, Maharashtra and Tamil Nadu.

## Drug procurement and logistics management

### Drug logistics system

A key component of RNTCP is to ensure an uninterrupted availability of drugs. The effective drug management and logistics, with an in built accountability system, has helped to expand RNTCP to almost the entire country.

Significant improvements over the past system in supply, storage and quality control practices and procedures have been achieved in India, which has resulted in continuous and timely access to good quality drugs by patients covered under RNTCP and minimised the expiry of drugs.

### Drug procurement

RNTCP Phase-II has started from October 2005 with the funding for supply of drugs for 500 million population from DFID. DFID will procure these drugs through Global Drug Facility (GDF), hosted by WHO. Drugs for the rest of the country would be procured centrally following the World Bank Procurement Guidelines.

### Drug logistics management

Nineteen States have established 25 State Drug Stores (SDS) in the respective States. Drugs for the respective districts, based on their Quarterly Reports, are issued to these SDS for onward distribution to the districts. This has been an important step towards decentralisation of responsibilities of drug logistics to the States. Manuals for State and district levels encompassing the Standard Operating Procedures in drug management have been prepared by Central TB Division for the States based on which training to DTOs and Pharmacists in each State, is being imparted along with functionaries managing the SDS. Four States have already been trained on drugs logistics and it is envisaged that in the coming months, all the States will be trained. The workshop has been designed to primarily acquaint key officials directly concerned with operational procedures on drug logistics at the State and district level. This is expected to go a long way in strengthening the drug management at the State level.

The drugs procured continue to be stored at the six Government Medical Store Depots (GMSD) across the country. Drug requirement, consumption and stock positions, both at State and district levels, continue to be closely

## RNTCP stall at health mela



Smt. Sonia Gandhi, Chairperson, National Advisory Council, at the TB stall in health mela organised at Raebareli, March 2005

A health mela was organised between 31 March 2005 and 2 April 2005 at Raebareli district in Uttar Pradesh by the district authorities in collaboration with the Government of Uttar Pradesh and the Ministry of Health and Family Welfare of the Government of India, New Delhi. A stall was put up at the mela to inform visitors about RNTCP services, including IEC. More than 4,000 people living in and around the district who visited the stall during the mela were told about the RNTCP. The stall was appreciated by all visitors.

monitored at the Central TB Division through the quarterly reports submitted by the districts. The drugs are issued to the States to replenish their stocks up to 10 months level. For the States which have not established SDS as yet, drugs are issued to the districts to replenish their stocks up to seven months level.

It is equally important that once the drugs are issued to the districts, they are kept in safe custody; they are timely available to the patients after diagnosis ensured; they are stored properly and safely dispensed with proper instructions to the patient. The same has been ensured by the Programme.

### Quality assurance

Maintaining quality of drugs is a critical Programme requirement. This is enabled through pre-dispatch testing of drugs and monitoring of the quality throughout their shelf-life up to consumption by the patients. CTD has hired an independent quality control laboratory, which regularly tests samples, taken on a random basis from DTC, SDSs and GMSDs. A system is also in-place for the quality assurance of drugs through random sampling by GMSDs. In addition, the samples are also taken by State and Central Drug Inspectors and tested to ensure quality.

The various measures that have been adopted by the Programme for quality assurance include careful supplier selection, certification of good manufacturing practices, batch certification, pre- and post-dispatch inspection, proper storage and dispensing methods and product defect reporting.

### Information, Education and Communication (IEC)

The IEC strategy continues to be an important component of the RNTCP. It addresses health communication issues that enhance the performance of the Programme, including advocacy and social mobilisation. It aims to create demand for services and increase utilisation of services. IEC aims at systematic implementation of communication activities based on the knowledge of the target group's communication needs and through the use of appropriate local media.

The Programme emphasises decentralised planning, choice of channels and monitoring. A targeted, focused, need-based, locally-appropriate strategy is envisaged to address special groups such as tribals, marginalised people and those living in urban slums.

A number of IEC activities have been planned at national, State and district levels. States and



Vivek Oberoi, Film Celebrity, featuring in a TV Spot



Awareness run being flagged off by the Hon'ble Union Minister of Health and Family Welfare, Dr. Anbumani Ramadoss

districts implement IEC activities as per their Annual Action Plans. The States and districts have organised sensitisation meetings, patient-provider interaction meetings, community meetings, health mela, exhibitions, etc.

Media activities on electronic media (national, satellite and regional channels), radio and print are undertaken at the national level.

New TV spots with a film celebrity, were produced in May 2005 and have been telecast all over the country. These spots have also been made available to States and districts for use in regional channels and cable networks.

A run was organised to generate awareness about TB in New Delhi, on World TB Day 2005. It was flagged off by the Hon'ble Minister of Health and Family Welfare and was attended by senior Government officials, representatives of the WHO and other partner organisations of the RNTCP, and school children.

Media workshops and photo exhibitions were organised in the States of Madhya Pradesh, Maharashtra and Uttaranchal by a national media agency in collaboration with the respective States. These were attended and inaugurated by the political and administrative heads of the States.

Prototype materials have been developed for different target audiences. With a focus on collaboration with other sectors, material has been developed at the national level and made available to all States and districts.

An attractive PPM Kit containing IEC material (flip book, display board, treatment chart and stickers) along with an information-loaded diary, calendar and memento, was distributed to all States and districts.



PPM Advocacy Kit

### Frontline TB care providers organise awareness rally on World TB Day

More than 60 health workers organised and participated in an awareness rally on World TB Day, 24 March 2005, at Pankhajur tehsil of Kankde district in Chhattisgarh. The rally was attended by 25 TB patients who were either undergoing treatment or were cured. They carried banners and placards bearing the slogan 'Use DOTS, Cure TB'. Anganwadi workers also participated in the rally.



Creating awareness among school and college students, medical and paramedic students at a Media Workshop in Bhopal, September 2005

# Success Stories

Ordinary people have made extraordinary efforts to make DOTS services available and accessible even in the most remote corners of India. The Programme is proud of its large contingent of healthcare providers, NGO workers, members of self-help groups, and cured patients, who work with extraordinary commitment and dedication. Their efforts have made the Programme a success. Their number is large, and some of their stories here provide just a sneak preview.

## Food stall works as DOT centre – Mumbai

Prem Neelkanth runs a food stall in a sprawling Mumbai slum of overcrowded shacks, narrow alleyways and open sewers. He also dispenses medicines there. Many TB patients – mostly labourers – live there. They do not have the time to visit the health centre for treatment. Every day, they visit Neelkanth's stall to take their medicines under his observation. "My shop is now like a TB clinic", he says, pointing to a neat row of medicine boxes marked with patients' names, given to him by health officials of the city. "I know everyone in the neighbourhood. So if someone does not turn up for their dosage, I go and knock on their door at night. It is my duty to ensure they don't miss a single dose".

## Women volunteers provide DOTS – Jabalpur, Madhya Pradesh

Twelve women volunteers in the Motinala slum of Jabalpur district, Madhya Pradesh, provide DOTS from their homes. About 200,000 people live in the slum. The only health centre at Motinala is understaffed and is too far away for patients to visit. The District TB Officer organised a modular training programme at the District TB Centre for 25 women volunteers, followed by two months' training on the job at the Motinala Urban Health Centre. Apart from the 12 active volunteers, rest of the trainees serve patients in the neighbourhood whenever a case is detected. Each of these DOTS providers is catering to more than 10 patients from their residence. Ten DOTS providers have already cured 15 patients.



Volunteers at the Motinala Urban Health Centre, Jabalpur

## Taking DOTS to marginalised sections in urban slums – Delhi

Half the population of Delhi comprises migrants and labourers who live in large slums where the quality of housing is poor, sanitation facilities are basic or non-existent, and the settlements over-crowded. The Directorate of Health Services of the Government of Delhi operates the Urban DOTS Scheme. Under the scheme, GLRA, an NGO working in the fields of TB and leprosy, provides DOTS in certain slums of Delhi. Local residents who have completed school, are available full-time and acceptable to the community, are appointed Community DOT Providers. Shopkeepers, housewives and cured patients are commonly appointed. The scheme has succeeded, as the patients, most of whom are daily wagers, find it very convenient to have DOTS at their doorsteps. There are more than 300 patients on DOTS in 20 slums. The NGO plans to extend the project to other slums in phases.



DOTS Centre at resettlement colony in Delhi



Lalthanpuii, Anganwadi worker is also a DOT provider

## Anganwadi worker provides DOTS with exemplary success – Mizoram

Lalthanpuii, an Anganwadi worker in Tawipui 'N', Lunglei district, Mizoram, also works as a DOT provider, and has cured 16 of 21 patients under her care. As an Anganwadi worker, she has personal access to nearly all households in the community she serves, particularly women.



### Flexible DOTS for pavement dwellers in Chandni Chowk – Delhi

The State Government of Delhi has also initiated a project to provide DOTS to pavement dwellers in Chandni Chowk. A large number of people migrate to Delhi for better employment opportunities. With nowhere to stay, they spend nights on the pavements near Old Delhi Railway Station. Since they do not have a permanent place of residence, it is difficult to verify it. In order to cater to this section, some degree of flexibility in the principles of DOTS has been made while retaining the essence of DOTS. A doctor, along with a Senior Treatment Supervisor and a Laboratory Technician, visits the pavement dwellers early on Monday, Wednesday and Friday mornings, before they leave for earning their livelihood, and provides DOTS to them according to RNTCP recommendations. Delhi TB Association, an NGO, has been entrusted with this project.



A make-shift DOTS Centre on the pavement in Chandni Chowk in Delhi

### NGOs working in largest urban slum–Pilkhana, West Bengal

Pilkhana, the second largest slum in India, under T L Jaiswal Hospital TU in the Howrah Municipal Corporation, had a high default rate (23%) and high death rate (9%) in the initial years after programme implementation. A NGO, Paschim Banga Ganatantrik Mahila Samity, with its community-based partner Pilkhana United Club, started a DOT centre in the slum area. Till date, they are providing DOTS to more than 100 TB patients with great dedication. Retrieval and early diagnosis through their own network and word of mouth has helped the good name of RNTCP to seep in to the urban, marginalised and migratory population of Howrah. This community-based DOT Centre run by Mahila Samiti is highly acceptable amongst the conservative Muslim population (especially the females), which is predominant in the Pilkhana area.

### From despair to hope for an HIV-positive mother – Karnataka

Pre-operative screening for surgery of a 30-year-old mother of three from a backward rural area of northern Karnataka, revealed her HIV-positive status. Four years after surgery, she developed severe breathing problems and high grade fever, and was admitted to a hospital where doctors confirmed that she was immuno-compromised and transferred her to a TB sanatorium near Bijapur. On learning about her serious condition, her family abandoned her.

Her X-ray revealed a massive right side pleural effusion and her sputum tested positive for TB. She was put on DOTS, and in a fortnight, her face carried a radiant smile as her pleural effusion was resolving. She was reunited with her family and designated to a TU to complete her TB treatment. Life is full of hope for her now. This is one of the examples of reassurance to PLWHAs that TB is curable.

### Evening DOTS centre of the Urban DOT Project – Mumbai

INTERAIDE has started many DOT centres in the slums of Mumbai through its partner NGOs to provide convenient DOTS to the TB patients. One such NGO is Maharashtra Janavikas Kendra, which is currently operating seven DOTS centres. An important feature of this is that five of these are 'Evening DOTS Centres'. As most of the TB patients started on treatment are able to go to work or become capable of doing so soon after starting treatment, they find it difficult to attend the regular morning DOTS centres (9:30 am to 4 pm). Hence the Evening DOTS Centres were started to cater to the working patients. The timings are also suitable for students and some housewives who prefer to come to the centres after finishing their daily work. Another interesting feature to note is that one of the DOT Providers is herself a cured TB patient.



Sushma Pandey, aged 21 years, a cured TB patient, is a dedicated DOT Provider

## Efforts to provide DOTS by an NGO and the Railways – West Bengal



IEC at Ramakrishna Mission at Belur Math, Howrah



Implementation of RNTCP in Bally Municipality on 4 October 2005 in West Bengal

The Ramakrishna Mission, a social welfare organisation run by monks, is headquartered at Belur Math in Howrah district of West Bengal. It runs medical and healthcare activities in West Bengal and other States of India. They have been participating in the RNTCP since November 2003 as a Microscopy Centre and Treatment Centre in Scheme IV for NGOs under T L Jaiswal Hospital TB Unit in Howrah. Two Medical Officers, one Laboratory Technician and four DOT providers have already been trained as per RNTCP guidelines. They are providing DOTS to more than 100 TB patients.

The Eastern Railway Hospital at Liluah in Howrah district of West Bengal has been implementing RNTCP as a Microscopy Centre and Treatment Centre under T L Jaiswal Hospital Tuberculosis Unit since August 2002. There are around 10,000 workers in Liluah Railway Workshop (population of 40,000). This is a nodal centre for TB patients of Railway employees and their dependents. The centre has a chest clinic and indoor beds. The DMC of this hospital has a room dedicated for RNTCP work. Before the beginning of work, two Laboratory Technicians were given a thorough 10-day Modular Training on RNTCP at the District Tuberculosis Centre inside the Howrah District Hospital campus from 14 August 2002. All the Medical Officers are participating actively in the RNTCP by referring the chest symptomatics for sputum examination. Around 80 TB patients are on DOT here. Retired Railway employees and volunteers of Railway Scouts have been trained to act as DOT providers.

## Pharma firm serves the community – Uttar Pradesh

Jubilant Organosys, a pharmaceutical research and manufacturing company, has set up a DOTS centre called Sarvajanic Medical Centre in J P Nagar district of Uttar Pradesh. The Centre collaborates with the Government in providing diagnosis, identification, treatment and control facilities for TB in 20 villages. This NGO runs one of the 12 DOTS centres in the district. The DOTS centre has improved the reach and depth of the company's effort at serving the community.

## NGO's Mission to Control TB – Punjab

The Lions Club has been working with a missionary spirit for TB control for last two years in 11 districts of Punjab. The Club has launched, 'Mission – TB Control' for supporting RNTCP. The NGO is mainly undertaking activities for awareness generation about TB among the public, conducts seminars and publishes brochures on TB. In recognition of the services of the Club, the State TB Society has conferred an Appreciation Award to its chief coordinator Dr Singla. The Club is committed to continue the work in this direction.



Chief coordinator 'Mission TB Control' Project of Lions Clubs being presented appreciation award by Civil Surgeon, Sangrur, 2005



### Win-win situation – Pune

Private medical practitioners in Pune say their practice has improved after providing DOTS in their clinic. Patients they have treated under RNTCP are very happy and refer more patients to them.



### Community volunteer promotes DOTS – Chandigarh

The success of DOTS depends, ultimately, on an army of health workers, social activists and community volunteers, who spread the message of TB services, and counsel chest symptomatic patients to get themselves diagnosed and take the full course of treatment.

Private medical practitioners involved in RNTCP

One of the unsung heroes of the RNTCP is Mrs Harish, a community volunteer in Chandigarh. She has provided the full course of treatment to 306 patients since 2002, when the Programme was launched, and is currently treating 65 patients. She retrieved three defaulting patients by persuading them to take DOTS; two of them are now cured, and one is now taking medicine regularly.

### Popular DOT provider becomes municipal councillor – Chhattisgarh

Mithileshwari Vaishnav, councillor of Ward No. 29 of Rajnandgaon district, used to be a DOT provider in Lakhauri. Very popular among her patients, she was elected a councillor recently. She credits DOTS with providing her with an opportunity to serve her community, made up mostly of labourers, first as a community worker, and now as a councillor.

### Hospital creates TB awareness among school children through health festivals – Delhi

The Community Health Department, St. Stephen's Hospital (CHD-SSH) organised Health Festivals in 15 schools of East Delhi. The Health Festivals are held for a day, which includes Health Exhibition, Awareness Session on DOTS, Quiz, Poster competitions and training of DOTS Ambassadors. A total of 11,372 school children have been covered under this Programme.

Health talks followed by a small exhibition are organised at assembly time for two hours in schools not covered under the School Health Programme. Trained volunteers answer queries of children visiting the exhibition.

The CHD-SSH runs a Community Based DOTS Programme in collaboration with State TB Cell (STBC), Delhi, to create awareness among the residents and school children of slums and resettlement colonies regarding DOTS. A team of CHD-SSH, along with volunteers from the community organise street shows in the evening hours using multimedia approach in Street Plays, Dance Shows, Health Talks and Road Side Exhibitions. They have created awareness in 15,660 residents of slums and resettlement colonies.



Health exhibition in school, Delhi



Street play in progress, Delhi

## Research Activities

“In recent years India has taken major strides towards controlling TB. The Stop TB Partnership is confident that India will continue the momentum and contribute significantly towards the implementation of the Global Plan to Stop TB, 2006-2015. For its part, the Partnership will continue to support India through the procurement of low-cost, quality TB drugs and technical support via its Global Drug Facility.”

Dr Marcos Espinal, Executive Secretary,  
Stop TB Partnership Secretariat, Geneva

### Research activities in 2005

The priority of research in RNTCP aims to improve DOT services to make them more patient-friendly, ensure that treatment is directly observed and increase detection of smear positive cases. Research is undertaken at various levels. A broad framework and proposals aimed at addressing these issues has been prepared and is available at the RNTCP website [www.tbcindia.org](http://www.tbcindia.org).

A number of studies have been done in this field. Some of these have been and are being initiated/sponsored and funded by the Central TB Division, some have been undertaken by the States and national/central institutes, and others have been carried out by the teaching and training institutes. This section summarises some of the studies and lists reference material.

### Social Assessment Survey

The Social Assessment Survey was undertaken to understand the social and cultural contexts of the poor, their health needs and their utilisation of health services. The goal is to improve access, service quality and effectiveness, thereby enhancing benefits for the poor and vulnerable groups and minimising institutional barriers. It entailed studying the perceptions of the poor about ill-health/disease, their health-seeking behaviour and patterns of utilisation, including gender differentials. The survey

also looked at constraints of vulnerable groups, including the tribals, in accessing healthcare and the level of beneficiary satisfaction with healthcare facilities and providers.

The study was commissioned by CTD and was conducted by the ORG Centre for Social Research. Many of the recommendations and findings of the study have formed the basis for RNTCP II, for addressing the needs of marginalised sections and making DOT services accessible to these sections. Tribal action plans, provision of sputum collection and need-based locally appropriate, culturally specific IEC initiatives are some of the recommendations that have been incorporated in the next phase of the Programme.

RNTCP II has taken care to have mechanisms in place to make its services appropriate, accessible, acceptable and affordable to marginalised groups.

The full text of the study is available at the RNTCP website [www.tbcindia.org](http://www.tbcindia.org).

### Institutional Assessment Study

An Institutional Assessment was conducted to take stock of the organisational mechanism (structure) and to develop a strategic framework for RNTCP II. In view of the study and recommendations of the 2003 GoI/WHO Joint RNTCP Monitoring Mission,

the Programme has established five units in the Central TB Division to manage the Programme effectively and efficiently. The assessment has addressed the issues of the role of external technical support from WHO and of strengthening the capacity of the States to manage the RNTCP in the respective State.

The full text of the study is available at the RNTCP website [www.tbcindia.org](http://www.tbcindia.org).

### **Study on environmental and bio-medical waste management under RNTCP**

The RNTCP has been implemented in the country since 1997. The basic unit of the Programme is the Designated Microscopy Centre (DMC), which is a sputum microscopy laboratory set up for a population of about 100,000 in normal areas and for about 50,000 in tribal and hilly areas. Most of the waste generated under RNTCP is at these laboratories. At treatment centres, there is minimal waste generated in the form of empty blister packs and used syringes (which are generated only in Category II cases, at the rate of 24 syringes per Category II patient treated).

Most of the technical guidelines and training modules were prepared in the early years of the Programme, when the Bio-medical Waste Management Rules, 2000 had not come into effect. The Programme has technical instructions for waste disposal at the DMCs, which constitute the major chunk of waste generated at health centres.

It has been estimated by the Environment Assessment conducted for the RNTCP that the average quantum of waste generated in RNTCP centres is approximately 2.5 to 3.8 kg per day, which is relatively small.

RNTCP-II will take measures to update the waste management guidelines to various categories of staff. A Waste Management Plan has been included in the Programme to address all the issues that have been raised in the study.

The full text of the study is available at the RNTCP website [www.tbcindia.org](http://www.tbcindia.org).

### **Knowledge, Attitude, Practice (KAP) Endline Study**

Endline KAP has been conducted in August 2005 to evaluate the overall impact of communication on KAP and behaviour change. Baseline KAP study was conducted from December 2002 to January 2003 to understand the communication needs of the target audience including KAP related to TB, their media habits and information sources used and preferred. The media campaign was launched based on the finding of this study. Mid-term study and rapid assessment survey was conducted between January 2003 and August 2005 to track the progress of implementation. The endline study aimed to benchmark the level of KAP of target groups and also to record changes. The main finding indicates that there is an increase in the percentage of people identifying 'three weeks of cough' to TB, and an increase in awareness about availability of free treatment for TB in government health facilities. The study also identifies areas that need to be addressed through communication in future such as availability of drugs in patient-wise boxes, etc. The preferred sources of information and media habits have also been recorded in the study.

### **Abstracts**

#### **Comparison of 2-week and 3-week cough to increase the yield of smear-positive tuberculosis cases among outpatients in India**

*(Santha T, Garg R, Subramani R, et al. Ref. 10)*

The study was conducted in Governmental health facilities in six districts of three States (Maharashtra, Rajasthan and Tamil Nadu) in India. The objective was to estimate the prevalence of cough and to compare the detection of smear positive tuberculosis (TB) among out-patients with cough of two or three weeks. Trained health workers questioned each out-patient attending the respective health facility for the presence of cough. Those with cough 2 weeks underwent

sputum microscopy. Of 55,561 out-patients interviewed, 2,210 (4%) had cough 2 weeks, of whom 267 had sputum positive TB, compared to 182/1,370 with cough 3 weeks. The 31% who did not spontaneously complain of cough were less likely to be sputum-positive than those who did (45/680 [7%] vs. 222/1530 [15%],  $p < 0.001$ ), but they accounted for 45/267 smear positive cases. Using cough 2 weeks as the screening criterion, the estimated number of smears performed per day at each primary and secondary health care facility was respectively 8 and 19, compared to 5 and 12 using cough 3 weeks. The authors conclude that the detection of smear-positive TB cases can be substantially improved by actively eliciting a history of cough from all out-patients, and by changing the screening criterion for performing sputum microscopy among out-patients from cough 3 weeks to 2 weeks. However they cautioned that before implementing such a wide ranging policy change nationally, its programmatic feasibility needed to be assessed.

### **Estimation of burden of tuberculosis in India for the year 2000**

(Gopi G, Subramani R, Santha T, Chandrasekaran V, Kolappan C, Selvakumar N and Narayanan PR. Ref 13)

Data on the burden of tuberculosis (TB) in India are vital for Programme planners to plan the resource requirements and for monitoring the nation-wide TB Control Programme. There was a need to revise the earlier estimate on the burden of TB in India based on the increase in population and current epidemiological data. Using data on TB disease prevalence among adults generated by the TB Research Centre (TRC), Chennai, among children by the National TB Institute (NTI), Bangalore, and the annual risk of TB infection (ARTI) estimates from the 2000-2003 nation-wide sample survey by NTI and TRC, an estimate of the burden of TB disease in the Year 2000 was calculated. The estimated number of bacillary cases was 3.8 million (95% CI: 2.8-4.7). The number of a bacillary cases was estimated to be

3.9 million and that for extrapulmonary cases was 0.8 million, giving a total burden of 8.5 million (95% CI: 6.3-10.4) for 2000. This present estimate differs from earlier estimates in that it includes the disease burden of X-ray suspected cases that are likely to breakdown to bacillary cases in a one year period and extrapulmonary TB cases. These current estimates provide Year 2000 baseline data that can be used both for advocacy and planning resource allocation for TB control activities, as well as for comparison against data in future years to measure the long term impact of TB control activities in India.

### **Average risk of tuberculous infection in India**

(Chadha VK, Kumar P, Jagannatha PS et al. Ref 19)

Estimates of the prevalence of tuberculous infection among children aged 1-9 years were available for four defined zones of India from a nation-wide tuberculin survey conducted from 2000 to 2003. By pooling this available zonal data, the average annual risk of TB infection in India was computed to be 1.5%. It was higher in urban areas, at 2.2%, than in rural areas, at 1.3%. The authors state that in order to bring this high ARTI down, further strengthening of the whole range of TB control activities is required.

### **Annual risk of tuberculous infection in four defined zones of India: a comparative picture**

(Chadha VK, Agarwal SP, Kumar P et al. Ref 22)

To estimate the average annual risk of TB infection (ARTI) in four defined zones of India, a tuberculin study of children aged 1-9 years in selected clusters of 26 districts was conducted using 1TU PPD RT23 with Tween 80, during the period 2000 to 2003. Prevalence of infection was estimated using the cut-off method (Method I) and the mirror-image technique (Method II) among children without BCG scar. The ARTI computed from the estimated prevalence was found to be lowest in the southern zone (Method I: 1.1%, Method II: 1.0%). It was higher in the eastern zone (1.3% by both methods)

and highest in the western (Method I: 1.8%, Method II: 1.6%) and northern zones (1.9% by both methods). The proportion of infected children was found to be significantly higher in urban than in rural areas in all zones. The authors conclude that intensified TB control efforts will need to be sustained for many years in order to reduce the risk of TB infection and control TB in India.

### **Short-course chemotherapy for paediatric respiratory tuberculosis: 5-year report**

*(Swaminathan S, Raghavan A, Duraipandian et al. Ref 23)*

This report presents the 5-year follow-up of 137 children with respiratory tuberculosis enrolled in a randomized clinical trial of two different anti-tuberculosis regimens of 9 months of daily isoniazid and rifampicin (9HR) and 2 months of thrice weekly isoniazid, rifampicin and pyrazinamide followed by 4 months of twice weekly isoniazid and rifampicin (2H<sub>3</sub>R<sub>3</sub>Z<sub>3</sub>/4H<sub>2</sub>R<sub>2</sub>). Both regimens had similar cure rates, with low relapse rates and mortality. Of 134 children followed up to 5 years, 86% had normal radiographs, with more long term sequelae seen in the 9HR group (15% vs. 1.5%, p<0.01). One patient relapsed and there was one accidental death. Short course chemotherapy in children is safe, effective and well tolerated, and leads to excellent long-term results, with a small proportion of children left with radiological sequelae. The thrice weekly regimen, which had no relapses and lower rates of sequelae, will be operationally more feasible to implement in a programme setting.

### **Improved tuberculosis case detection through public-private partnership and laboratory-based surveillance, Kannur district, Kerala, India, 2001-2002**

*(Kumar MKA, Dewan PK, Nair PKJ et al. Ref 24)*

In Kannur district of Kerala, a public-private partnership based on surveillance of TB cases detected in private laboratories and treated with the standardised RNTCP directly observed treatment regimens, was established and

evaluated over the period 2001-2002. RNTCP offered training in microscopy to all large private sector laboratories, and educated private physicians on the importance of microscopy for TB diagnosis. Of 2,328 pulmonary TB patients registered from July 2001 to December 2002, 404 (17%) were detected in the private sector. The annual new AFB-positive case notification rate increased by 21%, from 27.8/100,000 in 2000 to 33.5/100,000 in 2002. Surveillance at private laboratories also found an additional 260 non-registered AFB-positive patients. The authors concluded that this public-private partnership substantially increased TB case detection in Kannur district, and established a sustainable framework for private sector involvement in TB control. In the setting of a strong public sector programme, the combination of active surveillance of private laboratories along with physician sensitisation is a promising approach to improve TB case detection.

### **The impact of HIV/AIDS on the control of tuberculosis in India**

*(Williams BG, Granich R, Chauhan LS, Dharmshaktu NS, Dye C. Ref 31)*

Epidemics of HIV/AIDS have increased the TB caseload by five or more times in East Africa and southern Africa. As HIV continues to spread, warnings have been issued of disastrous AIDS and TB epidemics in "new-wave" countries, including India, which accounts for 20% of all new TB cases arising in the world each year. The authors investigated whether, in the face of the HIV epidemic, India's Revised National TB Control Programme (RNTCP) could halve TB prevalence and death rates in the period 1990-2015, as specified by the United Nations Millennium Development Goals. Using a mathematical model to capture spatial and temporal variation in TB and HIV in India, the authors predict that, without the RNTCP, HIV would increase TB prevalence (by 1%), incidence (by 12%) and mortality rates (by 33%) between 1990 and 2015. However with the RNTCP implemented, substantial reductions in prevalence (by 68%),

incidence (by 41%), and mortality (by 39%) are expected between 1990 and 2015. In India, 29% of adults but 72% of HIV-positive adults live in four large States in the south of the country, where even with RNTCP implemented, mortality is expected to fall by only 15% between 1990 and 2015. The authors conclude that nationally the RNTCP should be able to reverse the increases in TB burden due to HIV, but, to ensure that TB mortality is reduced by 50% or more by 2015, HIV-infected TB patients should be provided with anti-retroviral therapy in addition to the recommended treatment for TB.

### Papers published in 2005

- 1 Sulochana D, Sujatha Narayanan, Lalitha Hari, et al. "Differentiation of highly prevalent IS6110 single copy strains of *Mycobacterium tuberculosis* from a rural community in South India with an ongoing DOTS programme". *Infection, Genetics and Evolution* 2005; 5: 67-77.
- 2 Selvakumar N, S Sivagamasundari, E Prabhakaran, et al. "Storage of heat-fixed unstained sputum AFB smears for panel testing in a Tuberculosis Unit in South India." *Int J Tuberc Lung Dis* 2005; 9(2):223-225.
- 3 Selvakumar N, E Prabhakaran, BN Murthy, et al. "Application of lot sampling of sputum AFB smears for assessment of microscopy centres." *Int J Tuberc Lung Dis* 2005; 9(2):1-5.
- 4 Selvakumar N, BN Murthy, E Prabhakaran, et al. "Lot Quality Assurance Sampling of Sputum Acid-Fast Bacillus Smears for Assessing Sputum Smear Microscopy Centres." *J Clin Micro* 2005; 43(2): 1-3.
- 5 Selvakumar N, M Gomathi Sekar, KJ Ilampuranan, C Ponnuraja, PR Narayanan. "Increased detection by re-staining of acid-fast bacilli in sputum samples transported in cetylpyridinium chloride solution." *Int J Tuberc Lung Dis* 2005; 9(2):195-199.
- 6 Selvakumar N, M Gomathi Sekar, F Rahman, et al. "Comparison of variants of carbol-fuchsin solution in Ziehl-Neelsen for detection of acid-fast bacilli." *Int J Tuberc Lung Dis* 2005; 9(2): 226-229.
- 7 Rajeswari R, M Muniyandi, R Balasubramanian, PR Narayanan. "Perceptions of tuberculosis patients about their physical, mental and social well-being: a field report from south India." *Soc Sci Med* 2005; 60: 1845 – 1853.
- 8 Selvakumar N, Vanaja Kumar, PG Gopi, S Sivagamasundari, E Prabhakaran, Samuel Vasanthan, PR Narayanan. "Proficiency to read sputum AFB smears by Senior Tuberculosis Laboratory Supervisors under training at a reference laboratory in India." *Indian J Tuberc* 2005; 52: 11-14.
- 9 Nirupa C, G Sudha, T Santha, et al. "Evaluation of Directly Observed Treatment Providers in the Revised National TB Control Programme." *Indian J Tuberc* 2005; 52(2): 73-77.
- 10 Santha T, R Garg, R Subramani, et al. "Comparison of 2-week and 3-week cough to increase the yield of smear-positive tuberculosis cases among outpatients in India." *Int J Tuberc Lung Dis* 2005; 9(1):61-68.
- 11 Thomas A, PG Gopi, T Santha, et al. "Predictors of relapse among pulmonary TB patients treated in a DOTS programme in south India." *Int J Tuberc Lung Dis* 2005; 9(5): 556-561.
- 12 Gopi PG, V Chandrasekaran, R Subramani, PR Narayanan. "Failure to initiate treatment for tuberculosis patients diagnosed in a community survey and at health facilities under a DOTS programme in a district, south India." *Indian J Tuberc* 2005; 52(3): 153-156.
- 13 Gopi G, R Subramani, T Santha, V Chandrasekaran, C Kolappan, N Selvakumar and PR Narayanan. "Estimation of burden

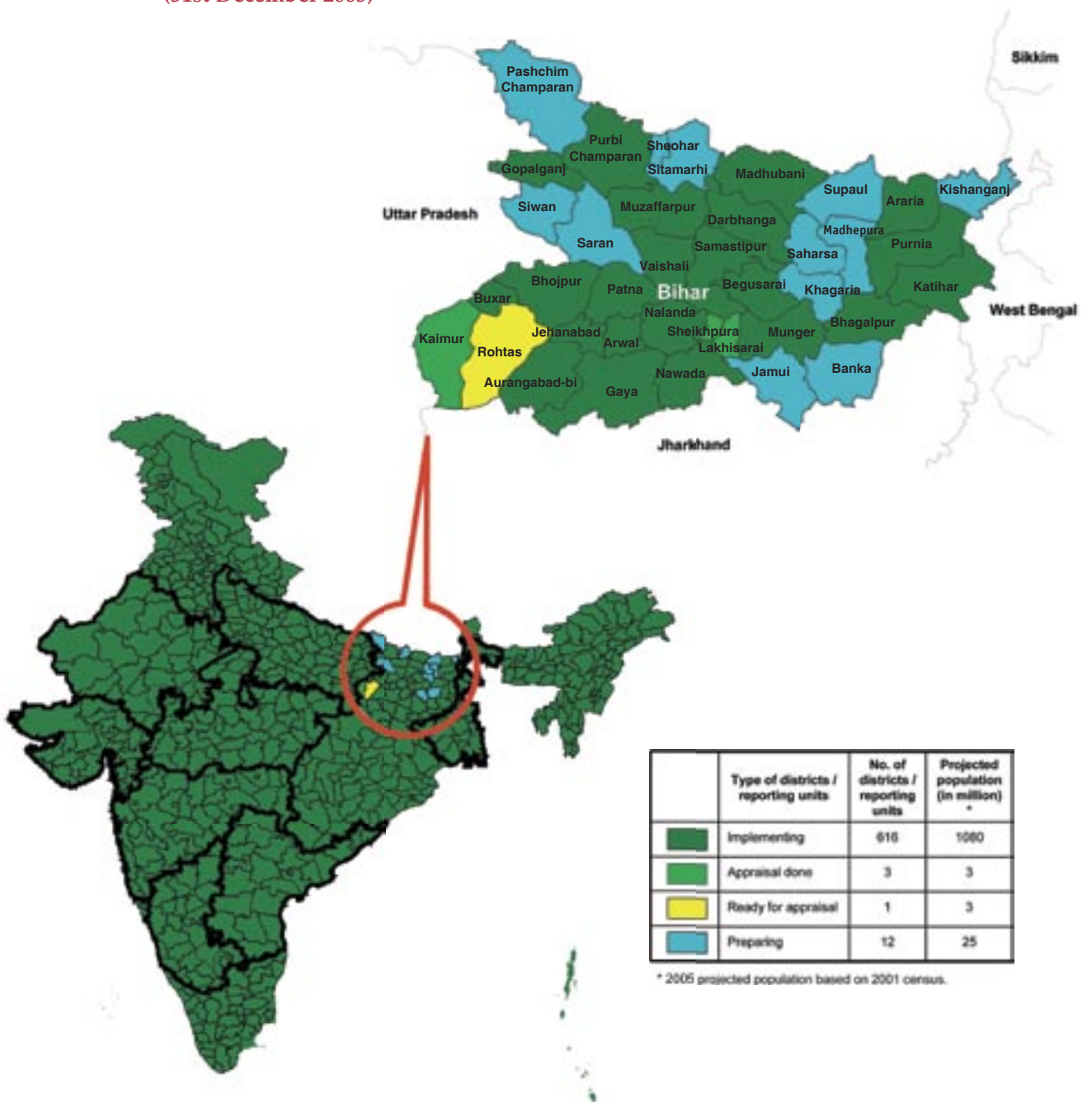


- of tuberculosis in India for the year 2000." *Indian J Med Res* 2005; 122(9): 243-248.
- 14 Suhadev M, S Swaminathan, A Rajasekaran, BE Thomas. "Feasibility of community DOT Providers for Tuberculosis treatment in HIV-infected individuals – a pilot study." *Indian J Tuberc* 2005; 52 (4): 179-183.
  - 15 Singh AA, RC Arora, DF Wares, LS Chauhan, R Granich. "Involvement of non-allopathic private practitioners under DOTS in an urban area of north India." *Indian J Tuberc* 2005; 52 (4): 184-187.
  - 16 Chandrasekaran V, PG Gopi, R Subramani, A Thomas, K Jaggarajamma, PR Narayanan. "Default during the intensive phase of treatment under DOTS programme." *Indian J Tuberc* 2005; 52(4):197-202.
  - 17 Santha T, PG Gopi, R Rajeswari, et al. "Is it worth treating Category I failure patients with Category II?" *Indian J Tuberc* 2005; 52(4): 203-206.
  - 18 Muniyandi M, R Ramachandran, R Balasubramanian. "Costs to patients with tuberculosis treated under DOTS programme." *Indian J Tuberc* 2005; 52(4): 188-196.
  - 19 Chadha VK, P Kumar, PS Jagannatha et al. "Average risk of tuberculous infection in India." *Int J Tuberc Lung Dis* 2005; 9(1): 116-118.
  - 20 Narang P, R Narang, R Narang et al. "Prevalence of tuberculous lymphadenitis in children in Wardha district, Maharashtra State, India." *Int J Tuberc Lung Dis* 2005; 9(2): 188-194.
  - 21 Ambe G, K Lonroth, Y Dholkia et al. "Every provider counts: effects of a comprehensive public-private mix approach for TB control in a large metropolitan area in India." *Int J Tuberc Lung Dis* 2005; 9(5): 562-568.
  - 22 Chadha VK, SP Agarwal, P Kumar et al. "Annual risk of tuberculous infection in four defined zones of India: a comparative picture." *Int J Tuberc Lung Dis* 2005; 9(5): 569-575.
  - 23 Swaminathan S, A Raghavan, Duraipandian et al. "Short-course chemotherapy for paediatric respiratory tuberculosis: 5-year report." *Int J Tuberc Lung Dis* 2005; 9(6): 693-696.
  - 24 Kumar MKA, PK Dewan, PKJ Nair et al. "Improved tuberculosis case detection through public-private partnership and laboratory-based surveillance, Kannur district, Kerala, India, 2001-2002." *Int J Tuberc Lung Dis* 2005; 9(8): 870-876.
  - 25 Swaminathan S, Paramasivan, C Ponnuraja et al. "Anti-tuberculosis drug resistance in patients with HIV and tuberculosis in India." *Int J Tuberc Lung Dis* 2005; 9(8): 896-901.
  - 26 Chadha VK. "Tuberculosis epidemiology in India: a review." *Int J Tuberc Lung Dis* 2005; 9(10): 1072-1082.
  - 27 Sharma N, DK Taneja, D Pagare et al. "The impact of an IEC campaign on tuberculosis awareness and health seeking behaviour in Delhi, India." *Int J Tuberc Lung Dis* 2005; 9(11): 1259-1265.
  - 28 Mahadev B, P Kumar, SP Agarwal, LS Chauhan, N Srikantaramu. "Surveillance of drug resistance to anti-tuberculosis drugs in districts of Hoogli in West Bengal and Mayurbhanj in Orissa." *Indian J Tuberc* 2005; 52 (1): 5-10.
  - 29 Singh AA, D Parasher, F Wares, S Sahu, LS Chauhan, R Granich. "Effectiveness of community-based anganwadi workers in the directly observed treatment of tuberculosis patients in a rural area of Haryana." *Indian J Tuberc* 2005; 52 (1): 15-20.

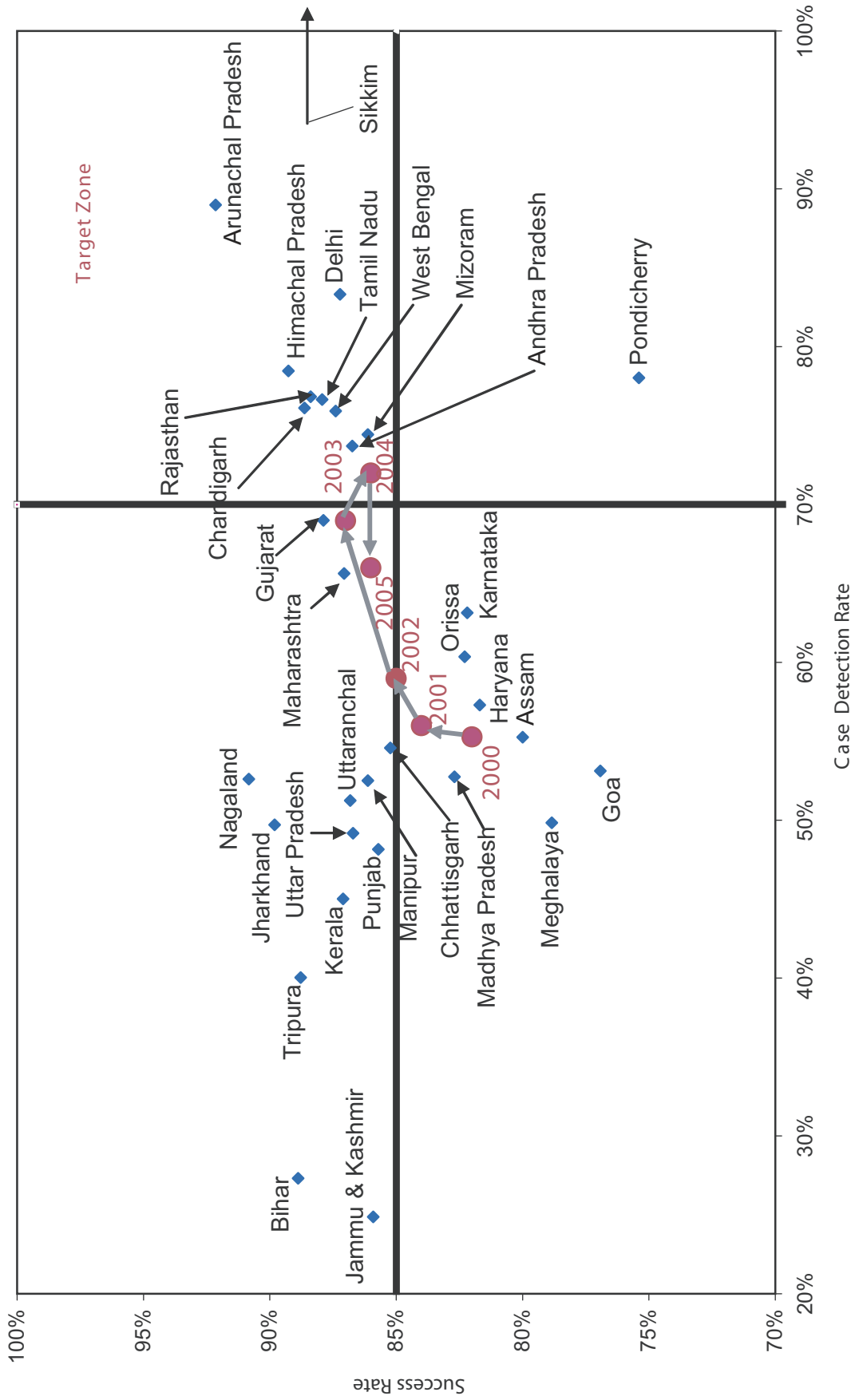
- 30 Biswas SK, PK Jain, R Bhatt. "Performance of a non-government institution working as a District Tuberculosis Centre under RNTCP." *Indian J Tuberc* 2005; 52 (2): 85-91.
- 31 Williams BG, R Granich, LS Chauhan, NS Dharmshaktu, C Dye. "The impact of HIV/AIDS on the control of tuberculosis in India." *PNAS* 2005; 102 (27): 9619-9624.
- 32 Pereira M, S Tripathy, V Inamdar et al. "Drug resistance pattern of Mycobacterium tuberculosis in seropositive and seronegative HIV-TB patients in Pune, India." *Indian J Med Res* 2005; 121: 235-239.
- 33 Padmapriyadarsini C, S Swaminathan. "Preventive therapy for tuberculosis in HIV infected individuals." *Indian J Med Res* 2005; 121: 415-423.
- 34 Immanuel C, L Victor, S Chelvi et al. "Serum Neopterin levels in HIV infected patients with and without tuberculosis." *Indian J Med Res* 2005; 121: 220-225.
- 35 Jawahar MS, K Rajaram, S Sivasubramanian et al. "Treatment of lymph node tuberculosis – a randomised clinical trial of two 6-month regimens." *Trop Med Int Health* 2005; 10 (11): 1090-08.
- 36 Karande S, V Gupta, M Kulkarni, A Joshi. "Prognostic clinical variables in childhood tuberculous meningitis: an experience from Mumbai, India." *Neurol India* 2005; 53(2): 191-5.
- 37 Singh RB, V Singh, SK Kulshrestha et al. "Social class and all-cause mortality in an urban population of North India." *Acta Cardiol* 2005; 60(6): 611-7.
- 38 Nelson, L J, Y Naik, et al. "Population-based risk factors for tuberculosis and adverse outcomes among Tibetan refugees in India, 1994-1996." *Int J Tuberc Lung Dis* 2005; 9(9): 1018-26.
- 39 Singla R, N Singla, et al. "Influence of pre-treatment bacillary load on treatment outcome of pulmonary tuberculosis patients receiving DOTS under Revised National Tuberculosis Control Programme." *Indian J Chest Dis Allied Sci* 2005; 47(1): 19-23.
- 40 Mathew A, C Binks, et al. "A comparison of two methods of undertaking directly observed therapy in a rural Indian setting." *Int J Tuberc Lung Dis* 2005; 9(1): 69-74.
- 41 Dam T, M Isa, et al. "Drug-sensitivity profile of clinical Mycobacterium tuberculosis isolates – a retrospective study from a chest-disease institute in India." *J Med Microbiol* 2005; 54(Pt 3): 269-71.
- 42 Kumar R. "Spinal tuberculosis: with reference to the children of northern India." *Childs Nerv* 2005; Syst 21(1): 19-26.
- 43 Khubnani H and K Munjal, "Application of bleach method in diagnosis of extra-pulmonary tuberculosis." *Indian J Pathol Microbiol* 2005; 48(4): 546-50.
- 44 Mutha A, S Tiwari, et al. "Application of bleach method to improve sputum smear microscopy for the diagnosis of pulmonary tuberculosis." *Indian J Pathol Microbiol* 2005; 48(4): 513-7.
- 45 Bedi R S, "DOTS centre at a tertiary care teaching hospital: lessons learned and future directions." *Indian J Chest Dis Allied Sci* 2005 47(3): 223.
- 46 Jesudason M V and P Gladstone. "Non-tuberculous mycobacteria isolated from clinical specimens at a tertiary care hospital in south India." *Indian J Med Microbiol* 2005; 23(3): 172-5.
- 47 Kumar P, R Kumar, et al. "Protective role of BCG vaccination against tuberculous meningitis in Indian children: a reappraisal." *Natl Med J India* 2005; 18(1): 7-11.

# Performance of RNTCP

## DOTS Implementation Status by District, India (31st December 2005)



Case Detection Rate and Treatment Success Rates in RNTCP areas for 2005/2004



● National annual case detection rate and treatment success rate from 2000 to 2005

**Annual Performance of RNTCP Case Detection (2005), Smear Conversion (2004) (4th quarter, 2004 and 1st to 3rd quarter, 2005) and Treatment Outcomes (2004)**

State	Population (in lakh) covered by RNTCP <sup>a</sup>	No. of suspects examined	Suspects examined per lakh population per year	No. of Smear positive patients diagnosed <sup>b</sup>	% of S+ve cases among suspects	Total patients registered for treatment <sup>c</sup>	Annual total case detection rate per lakh	New smear positive patients registered for treatment	Annual new smear positive case detection rate per lakh (%)	% new sputum positive out of total new pulmonary cases	No. of new smear negative cases registered for treatment
Andaman & Nicobar	4	1915	489	178	9%	375	383	130	93 (124%)	59%	90
Andhra Pradesh	798	445414	558	63552	14%	108670	136	44094	55 (74%)	53%	39866
Arunachal Pradesh	12	9906	827	1144	12%	2346	196	799	67 (89%)	52%	726
Assam	285	101333	355	16446	16%	29494	103	11830	41 (55%)	54%	10044
Bihar	611	84238	138	12407	15%	28012	73	8205	20 (27%)	37%	13806
Chandigarh	10	13496	1308	1526	11%	2478	240	746	72 (76%)	57%	574
Chhattisgarh	222	90361	407	12140	13%	23530	106	9704	44 (55%)	51%	9202
D & N Haveli	3	680	256	111	16%	141	213	80	69 (87%)	78%	22
Daman & Diu	2	1984	1054	201	10%	158	336	71	89 (112%)	72%	27
Delhi	160	153220	955	24460	16%	45717	285	12703	79 (83%)	58%	9269
Goa	14	10449	735	1059	10%	1731	122	604	43 (53%)	53%	542
Gujarat	549	313485	571	54729	17%	77087	140	30289	55 (69%)	66%	15398
Haryana	233	144788	622	22366	15%	34516	148	12669	54 (57%)	61%	7948
Himachal Pradesh	65	64270	991	8216	13%	13697	211	4832	75 (78%)	64%	2763
Jammu & Kashmir	112	68869	618	3283	5%	4478	71	1669	24 (25%)	57%	1262
Jharkhand	292	84369	288	13268	16%	26178	104	9742	37 (50%)	46%	11320
Karnataka	562	372176	662	42820	12%	68695	122	26612	47 (63%)	59%	18699
Kerala	330	231783	702	14374	6%	25074	76	11145	34 (45%)	69%	5094
Lakshadweep	1	34	53	1	3%	4	25	0	0 (0%)	0%	1
Madhya Pradesh	659	243055	369	44637	18%	72335	110	27802	42 (53%)	54%	23753
Maharashtra	1050	591035	563	77211	13%	144564	138	55109	53 (66%)	55%	44717
Manipur	27	14658	552	1354	9%	4639	175	1045	39 (53%)	39%	1654

(Contd.)

## Annual Performance (Contd.)

State	Population (in lakh) covered by RNTCP <sup>a</sup>	No. of suspects examined	Suspects examined per lakh population per year	No. of Smear positive patients diagnosed <sup>b</sup>	% of S+ve cases among suspects	Total patients registered for treatment <sup>c</sup>	Annual total case detection rate per lakh	New smear positive patients registered for treatment	Annual new smear positive case detection rate per lakh (%)	% new sputum positive out of total new pulmonary cases	No. of new smear negative cases registered for treatment
Meghalaya	26	8554	334	1230	14%	2953	115	957	37 (50%)	55%	770
Mizoram	10	6567	665	763	12%	1915	194	551	56 (74%)	48%	597
Nagaland	24	9742	402	1016	10%	2934	121	957	39 (53%)	55%	789
Orissa	389	173115	445	25550	15%	44501	114	19979	51 (60%)	62%	12385
Pondicherry	10	14767	1407	1476	10%	1462	139	614	59 (78%)	68%	291
Punjab	261	146105	560	18535	13%	30764	118	11944	46 (48%)	61%	7715
Rajasthan	624	336451	539	66908	20%	104315	167	38354	61 (77%)	55%	31716
Sikkim	6	7380	1219	825	11%	1578	261	521	86 (115%)	63%	310
Tamil Nadu	648	645967	997	53072	8%	92725	143	37254	57 (77%)	57%	28456
Tripura	34	7428	220	989	13%	1429	59	774	30 (40%)	69%	345
Uttar Pradesh	1820	706520	388	105892	15%	176022	119	71203	47 (49%)	54%	61212
Uttaranchal	91	55888	614	7338	13%	10825	119	4429	49 (51%)	60%	2996
West Bengal	857	525218	613	64544	12%	107741	126	48776	57 (76%)	64%	26896
<b>Grand Total</b>	<b>10800</b>	<b>5685220</b>	<b>526</b>	<b>763621</b>	<b>13%</b>	<b>1293083</b>	<b>128</b>	<b>506193</b>	<b>50 (66%)</b>	<b>56%</b>	<b>391255</b>

Values for grey areas are not expected

Estimated New Smear Positive cases / lakh population based on ARTI data for North Zone (Chandigarh, Delhi, Haryana, Himachal Pradesh, Jammu & Kashmir, Punjab, Uttar Pradesh, Uttarakhand) is 95; East Zone (Andaman & Nicobar, Arunachal Pradesh, Assam, Bihar, Jharkhand, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura, West Bengal) is 75; South Zone (Andhra Pradesh, Karnataka, Kerala, Lakshadweep, Pondicherry, Tamil Nadu) is 75 and West Zone (Chhattisgarh, Dadra & Nagar Haveli, Daman & Diu, Goa, Gujarat, Madhya Pradesh, Maharashtra, Rajasthan) is 80; Orissa is 85

<sup>a</sup> Projected population based on census population of 2001 is used for calculation of case-detection rate. 1 lakh = 100,000 population

<sup>b</sup> Smear positive patients diagnosed include new smear positive cases and smear positive retreatment cases

<sup>c</sup> Total patients registered for treatment includes new sputum smear positive cases, new smear negative cases, new extra-pulmonary cases, smear positive retreatment cases and 'Others'

**Annual Performance of RNTCP Case Detection (2005), Smear Conversion (4th quarter, 2004 and 1st to 3rd quarter, 2005) and Treatment Outcomes (2004)**

State	No. of new EP cases registered for treatment	% of new EP cases out of all new cases	No. of smear positive retreatment cases registered for treatment	% of retreatment cases out of all smear positive cases	No. (%) of paediatric cases out of all new cases	3 month conversion rate of new smear positive patients <sup>δ</sup>	Cure rate of new smear positive patients <sup>E</sup>	Success rate of new smear positive patients <sup>E</sup>	No. (%) of NSP cases started RNTCP DOTS within 7 days of diagnosis	No. (%) of NSP cases registered within one month of starting RNTCP DOTS treatment	No. (%) of cured NSP cases having end of treatment follow-up sputum done within 7 days of last dose	
Andaman & Nicobar	104	32%	39	23%	41	79%			88	97%	89	98%
Andhra Pradesh	8860	10%	12979	23%	2470	89%	84%	87%	32794	80%	40144	93%
Arunachal Pradesh	272	15%	336	28%	79	94%	92%	92%	631	90%	609	91%
Assam	2560	10%	3035	20%	977	85%	76%	80%	8705	86%	10329	95%
Bihar	1377	6%	2579	23%	1278	80%	85%	89%	2526	72%	2778	82%
Chandigarh	691	34%	290	28%	320	89%	88%	89%	610	82%	731	98%
Chhattisgarh	2208	10%	1631	14%	919	86%	83%	85%	8086	83%	9460	97%
D & N Haveli	22	18%	16	16%	2	65%			80	100%	80	100%
Daman & Diu	14	13%	28	28%	5	97%			69	97%	71	100%
Delhi	13286	38%	6008	32%	5013	91%	87%	87%	10406	90%	11571	100%
Goa	282	20%	177	22%	61	82%	74%	77%	486	80%	563	93%
Gujarat	9210	17%	15986	34%	2905	90%	85%	86%	24667	81%	29123	96%
Haryana	5212	20%	6851	35%	1381	86%	79%	82%	6688	88%	8067	96%
Himachal Pradesh	3139	29%	2211	31%	310	91%	88%	89%	2160	91%	2072	90%
Jammu & Kashmir	1242	30%	369	19%	97	88%	86%	86%	525	95%	464	100%
Jharkhand	1450	6%	2321	19%	865	86%	86%	90%	7739	83%	9051	95%
Karnataka	11112	20%	8808	25%	3100	85%	81%	82%	15763	82%	19633	89%
Kerala	5827	26%	2055	16%	1046	85%	85%	87%	9448	88%	10077	93%
Lakshadweep	0	0%	0	0%	0							
Madhya Pradesh	6489	11%	11018	28%	2006	85%	78%	83%	17662	79%	22134	93%
Maharashtra	21662	18%	14992	21%	7716	91%	86%	87%	39150	86%	43103	94%
Manipur	968	26%	327	23%	381	90%	86%	86%	1196	97%	1123	92%

(Contd.)

## Annual Performance (Contd.)

State	No. of new EP cases registered for treatment	% of new EP cases out of all new cases	No. of smear positive retreatment cases registered for treatment	% of retreatment cases out of all smear positive cases	No. (%) of paediatric cases out of all new cases	3 month conversion rate of new smear positive patients <sup>δ</sup>	Cure rate of new smear positive patients <sup>ε</sup>	Success rate of new smear positive patients <sup>ε</sup>	No. (%) of NSP cases started RNTCP DOTS within 7 days of diagnosis	No. (%) of NSP cases registered within one month of starting RNTCP DOTS treatment	No. (%) of cured NSP cases having end of treatment follow-up sputum done within 7 days of last dose	
Meghalaya	499	22%	382	28%	174	84%	75%	79%	760	794	554	67%
Mizoram	508	31%	187	24%	99	94%	86%	86%	267	269	221	84%
Nagaland	558	24%	412	30%	229	91%	90%	91%	567	588	303	80%
Orissa	6750	17%	3264	14%	1483	84%	73%	82%	3811	4689	3125	77%
Pondicherry	274	23%	253	29%	20	84%	69%	75%	NR	NR	NR	NR
Punjab	5518	22%	4420	27%	1194	88%	83%	86%	10491	11312	5138	87%
Rajasthan	11825	14%	19357	33%	3872	91%	86%	88%	26022	32458	25368	79%
Sikkim	397	32%	225	30%	192	88%	88%	88%	431	461	426	96%
Tamil Nadu	16968	21%	7602	17%	8521	91%	87%	88%	23524	28362	22481	78%
Tripura	180	14%	190	20%	29	86%	83%	89%	183	137	109	72%
Uttar Pradesh	15971	11%	23266	25%	7881	90%	84%	87%	44506	49536	28007	82%
Uttaranchal	1242	14%	1945	30%	406	93%	86%	87%	4147	4304	2937	92%
West Bengal	13661	15%	10818	18%	4774	90%	86%	87%	26281	31706	22235	83%
<b>Grand Total</b>	<b>170338</b>	<b>16%</b>	<b>164377</b>	<b>24%</b>	<b>59846</b>	<b>89%</b>	<b>84%</b>	<b>86%</b>	<b>330469</b>	<b>385888</b>	<b>258585</b>	<b>78%</b>

Values for grey areas are not expected

Estimated New Smear Positive cases / lakh population based on ARTI data for North Zone (Chandigarh, Delhi, Haryana, Himachal Pradesh, Jammu & Kashmir, Punjab, Uttar Pradesh, Uttaranchal) is 95; East Zone (Andaman & Nicobar, Arunachal Pradesh, Assam, Bihar, Jharkhand, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura, West Bengal) is 75; South Zone (Andhra Pradesh, Karnataka, Kerala, Lakshadweep, Pondicherry, Tamil Nadu) is 75 and West Zone (Chhattisgarh, Dadra & Nagar Haveli, Daman & Diu, Goa, Gujarat, Madhya Pradesh, Maharashtra, Rajasthan) is 80; Orissa is 85

<sup>δ</sup> Smear conversion rate not expected for States that began implementing RNTCP during 4th quarter 2005

<sup>ε</sup> Cure rate and success rate are not expected for States that began implementing RNTCP after 4th quarter 2004

EP - Extra Pulmonary

NSP - New Smear Positive

NR - Not Reported



Treatment Outcome of New Cases for 2004

Implementing States	New Smear Positive *						New Smear Negative #						New Extra Pulmonary #						
	Regist-ered	Cured	Comp-leted	Died	Failure	De-faulted	Trans-ferred	Regist-ered	Comp-leted	Died	Failure	De-faulted	Trans-ferred	Regist-ered	Comp-leted	Died	Failure	De-faulted	Trans-ferred
Andhra Pradesh	44610	84%	3%	5%	3%	5%	0%	39697	87%	5%	1%	7%	0%	7623	91%	3%	0%	6%	0%
Arumachal Pradesh	726	92%	1%	2%	3%	3%	0%	657	88%	4%	1%	6%	0%	289	89%	2%	1%	8%	1%
Assam	10105	76%	4%	5%	3%	11%	1%	9579	80%	4%	1%	13%	1%	1765	87%	4%	0%	8%	1%
Bihar	4821	85%	4%	3%	1%	7%	0%	6961	89%	2%	0%	8%	0%	856	93%	1%	0%	5%	0%
Chandigarh	721	88%	1%	3%	3%	4%	1%	486	92%	2%	1%	3%	2%	589	94%	2%	0%	3%	1%
Chhattisgarh	8046	83%	2%	5%	2%	7%	0%	8044	87%	3%	1%	9%	0%	1491	93%	1%	0%	5%	0%
Delhi	11971	87%	0%	3%	4%	5%	1%	9516	92%	2%	1%	5%	1%	11764	96%	1%	0%	3%	0%
Goa	182	74%	3%	4%	4%	10%	5%	143	80%	3%	1%	14%	1%	95	81%	3%	1%	15%	0%
Gujarat	30609	87%	1%	4%	3%	7%	1%	18741	85%	4%	1%	10%	1%	8924	90%	2%	0%	8%	0%
Haryana	13324	79%	2%	5%	4%	9%	1%	7859	84%	7%	2%	9%	1%	4232	92%	4%	0%	5%	1%
Himachal Pradesh	4957	88%	2%	4%	2%	4%	0%	2893	87%	5%	1%	7%	0%	2749	94%	2%	0%	4%	0%
Jammu & Kashmir	362	86%	0%	5%	1%	7%	1%	303	89%	3%	0%	7%	0%	185	90%	3%	0%	6%	2%
Jharkhand	7021	86%	4%	3%	1%	6%	0%	7085	91%	2%	0%	7%	0%	1048	94%	1%	0%	5%	0%
Karnataka	25733	81%	2%	6%	3%	8%	1%	19164	84%	6%	1%	9%	1%	9420	90%	4%	0%	6%	0%
Kerala	11091	85%	2%	4%	4%	5%	0%	6015	87%	5%	1%	7%	0%	5726	92%	3%	0%	4%	0%
Madhya Pradesh	23560	78%	5%	5%	3%	9%	0%	24032	86%	3%	1%	10%	0%	4745	94%	2%	0%	6%	0%
Maharashtra	54875	86%	1%	5%	2%	5%	1%	46540	87%	4%	1%	7%	0%	20209	90%	3%	0%	6%	1%
Manipur	1326	86%	0%	3%	2%	9%	0%	1723	87%	3%	0%	10%	0%	941	89%	2%	0%	8%	0%
Meghalaya	1253	74%	4%	5%	6%	10%	0%	1002	85%	5%	1%	8%	0%	743	94%	2%	0%	3%	1%
Mizoram	591	86%	0%	5%	4%	5%	0%	626	85%	5%	1%	8%	0%	511	93%	3%	0%	3%	1%
Nagaland	797	90%	1%	2%	3%	4%	0%	413	88%	2%	1%	9%	0%	519	91%	2%	0%	6%	0%
Orissa	19504	73%	10%	5%	1%	9%	1%	12355	88%	5%	0%	8%	0%	5964	89%	3%	1%	7%	0%
Pondicherry	508	69%	6%	5%	1%	19%	0%	223	76%	4%	3%	16%	0%	162	90%	1%	0%	7%	2%
Punjab	7369	83%	3%	4%	3%	7%	1%	5865	88%	3%	1%	7%	0%	3641	95%	2%	0%	3%	0%
Rajasthan	39657	86%	2%	3%	2%	7%	0%	33240	89%	3%	1%	8%	0%	10319	92%	2%	0%	6%	0%
Sikkim	550	88%	0%	3%	6%	2%	0%	407	83%	13%	2%	2%	0%	429	94%	2%	0%	2%	1%
Tamil Nadu	39456	87%	1%	5%	2%	5%	0%	31610	91%	4%	0%	5%	0%	15600	95%	2%	0%	3%	0%
Tripura	321	83%	5%	3%	4%	4%	0%	166	86%	8%	1%	5%	1%	68	74%	1%	0%	7%	1%
Uttar Pradesh	53269	84%	3%	4%	1%	8%	0%	53752	89%	2%	1%	8%	0%	11463	94%	1%	0%	5%	0%
Uttaranchal	3361	86%	1%	4%	3%	6%	0%	2432	91%	3%	1%	5%	0%	772	94%	2%	0%	3%	0%
West Bengal	44475	86%	1%	4%	2%	6%	0%	28840	87%	4%	1%	8%	0%	11828	92%	3%	0%	5%	0%
<b>Grand Total</b>	<b>465151</b>	<b>84%</b>	<b>2%</b>	<b>4%</b>	<b>2%</b>	<b>7%</b>	<b>0%</b>	<b>380369</b>	<b>87%</b>	<b>4%</b>	<b>1%</b>	<b>8%</b>	<b>0%</b>	<b>144670</b>	<b>92%</b>	<b>2%</b>	<b>0%</b>	<b>5%</b>	<b>0%</b>

\* - Treatment success for New Smear Positive is cured and treatment completed.

# - Treatment success for New Smear Negative and New Extra Pulmonary are treatment completed.

### Outcome of Smear Positive Retreatment cases for India, 2004 (excluding "Others")

Type of retreatment case	Cured	Success	Died	Failure	Defaulted	Transferred out	No. registered
Relapse	69.2%	74.4%	7.0%	5.1%	12.7%	0.6%	62390
Failure	55.1%	61.5%	8.1%	13.4%	16.4%	0.6%	16330
Treatment after default	62.5%	69.1%	7.4%	4.3%	18.2%	0.9%	68111
<b>Total</b>	<b>64.5%</b>	<b>70.5%</b>	<b>7.3%</b>	<b>5.6%</b>	<b>15.7%</b>	<b>0.7%</b>	<b>146831</b>

### State-wise outcome of Smear Positive Retreatment cases for 2004, (excluding "Others")

Implementing States	Cured	Success	Died	Failure	Defaulted	Transferred out	No. registered
Andhra Pradesh	60.9%	70.2%	9.4%	6.6%	13.5%	0.3%	11957
Arunachal Pradesh	77.9%	79.4%	4.1%	7.5%	7.8%	1.2%	321
Assam	56.5%	64.9%	8.3%	5.0%	18.8%	2.9%	2971
Bihar	70.4%	79.3%	7.1%	3.2%	10.2%	0.0%	1070
Chandigarh	81.0%	82.2%	3.3%	4.5%	8.3%	1.7%	242
Chhattisgarh	64.1%	70.4%	7.5%	5.3%	16.6%	0.1%	1486
Delhi	71.5%	72.4%	5.6%	6.9%	13.4%	1.8%	5990
Goa	50.0%	61.4%	7.1%	2.9%	27.1%	1.4%	70
Gujarat	55.9%	61.8%	7.1%	6.6%	22.7%	1.8%	16188
Haryana	63.6%	70.4%	7.2%	6.9%	14.6%	0.7%	6364
Himachal Pradesh	73.3%	78.2%	7.2%	6.4%	8.1%	0.1%	2194
Jammu & Kashmir	79.5%	79.5%	7.7%	6.4%	6.4%	0.0%	78
Jharkhand	77.2%	84.4%	6.0%	1.3%	7.9%	0.3%	1753
Karnataka	56.1%	62.6%	9.3%	6.3%	20.9%	1.0%	7739
Kerala	62.3%	69.1%	7.0%	6.5%	16.6%	0.7%	1949
Madhya Pradesh	61.5%	69.4%	7.6%	6.6%	16.2%	0.3%	8081
Maharashtra	62.3%	66.8%	8.7%	6.1%	17.4%	0.9%	14930
Manipur	68.4%	70.4%	6.7%	6.4%	16.5%	0.0%	358
Meghalaya	55.5%	63.8%	7.0%	14.0%	14.5%	0.7%	456
Mizoram	67.9%	71.2%	5.4%	10.9%	12.0%	0.0%	184
Nagaland	77.6%	78.9%	3.6%	8.4%	6.8%	0.7%	308
Orissa	52.3%	67.1%	6.3%	4.5%	16.9%	0.4%	3000
Pondicherry	43.3%	52.6%	6.4%	2.9%	37.4%	0.6%	171
Punjab	64.5%	75.8%	7.5%	5.2%	10.6%	1.0%	2668
Rajasthan	72.6%	78.3%	5.9%	3.4%	12.2%	0.2%	19827
Sikkim	63.8%	65.5%	6.2%	21.5%	5.7%	1.1%	177
Tamil Nadu	65.1%	68.2%	8.3%	5.8%	16.7%	1.1%	7903
Tripura	55.2%	83.6%	7.5%	1.5%	7.5%	0.0%	67
Uttar Pradesh	69.2%	75.3%	6.4%	3.9%	14.0%	0.1%	16792
Uttaranchal	72.9%	74.6%	6.1%	7.2%	11.4%	0.6%	1712
West Bengal	67.2%	70.4%	6.9%	6.7%	15.6%	0.4%	9825
<b>Grand Total</b>	<b>64.5%</b>	<b>70.5%</b>	<b>7.3%</b>	<b>5.6%</b>	<b>15.7%</b>	<b>0.7%</b>	<b>146831</b>

### Annual Performance of RNTCP Case Detection (2005), Smear Conversion (4th quarter, 2004 and 1st to 3rd quarter, 2005) and Treatment Outcomes (2004)

District	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	Popu- lation (in lakh) covered by RNTCP <sup>a</sup>	Total patients registered for treat- ment <sup>b</sup>	Annual total case de- tection rate per lakh	New smear positive patients regis- tered for treat- ment	Annual new smear positive case detection rate per lakh (%)	% new sputum positive out of total new pul- monary cases	No. of new smear negative cases regis- tered for treat- ment	No. of new EP cases regis- tered for treat- ment	% of new EP cases out of all new cases	% of new smear positive re-treat- ment cases out of all smear positive cases	No. of smear positive re-treat- ment cases regis- tered for treat- ment	No. (%) of paedi- atric cases out of all new cases	3 month conver- sion rate of new smear positive pati- ents <sup>d</sup>	Cure rate of new smear positive pati- ents <sup>e</sup>	Success rate of new smear positive patients <sup>e</sup>
<b>Andaman &amp; Nicobar</b>															
Andaman & Nicobar Islands	4	375	383	130	93 (12.4%)	59%	90	104	32%	39	23%	41	79%		
<b>Andhra Pradesh</b>															
Adilabad	26	2629	101	1455	56 (74%)	67%	716	86	4%	371	20%	38	90%	69%	79%
Anantapur	38	5527	144	2359	62 (82%)	56%	1883	430	9%	707	23%	79	90%	85%	85%
Bhadrachalam	8	1861	227	867	106 (14.1%)	60%	578	103	7%	300	26%	3	87%	85%	89%
Chittoor	39	4032	102	1692	43 (57%)	59%	1177	618	18%	488	22%	131	83%	84%	84%
Cuddapah	27	4200	155	1427	53 (70%)	45%	1768	271	8%	473	25%	29	90%	84%	86%
East Godavari	51	7346	143	2576	50 (67%)	48%	2835	992	15%	738	22%	479	92%	86%	87%
Guntur	46	7619	164	2981	64 (86%)	50%	2977	388	6%	937	24%	95	92%	87%	88%
Hyderabad	39	6014	155	2271	58 (78%)	58%	1661	1374	26%	542	19%	236	93%	91%	92%
Karimnagar	37	3101	85	1215	33 (44%)	50%	1192	125	5%	562	32%	14	90%	77%	86%
Khammam	19	3128	166	1466	78 (104%)	57%	1091	141	5%	419	22%	40	89%	84%	88%
Krishna	44	5858	132	2327	52 (70%)	51%	2201	291	6%	727	24%	132	92%	85%	86%
Kurnoor	37	6248	169	2095	57 (76%)	40%	3164	254	5%	598	22%	240	92%	87%	88%
Mahabubnagar	37	4432	120	1967	53 (71%)	51%	1868	136	3%	367	15%	88	89%	83%	83%
Medak	28	3141	112	1170	42 (56%)	49%	1218	330	12%	347	23%	83	86%	83%	91%
Nalgonda	34	4673	137	2008	59 (78%)	56%	1583	147	4%	912	31%	32	83%	78%	82%
Nellore	28	3392	121	1458	52 (69%)	61%	949	222	8%	629	30%	18	88%	87%	89%
Nizamabad	25	2743	111	1106	45 (60%)	46%	1279	162	6%	194	15%	34	93%	88%	88%
Prakasam	32	4251	132	1637	51 (68%)	46%	1930	221	6%	370	18%	30	72%	69%	84%
Rangareddi	37	4653	126	2122	57 (77%)	62%	1283	493	13%	644	23%	91	82%	85%	86%
Srikakulam	27	3881	146	1578	59 (79%)	49%	1662	347	10%	272	15%	121	91%	86%	93%

(Contd.)

Annual Performance of Districts (Contd...)

District	Population covered by RNTCP <sup>α</sup> (in lakh)	Total patients registered for treatment <sup>γ</sup>	Annual total case detection rate per lakh	New smear positive patients registered for treatment	Annual new smear positive case detection rate per lakh (%)	% new sputum positive out of total new pulmonary cases	No. of new smear negative cases registered for treatment	No. of new EP cases registered for treatment	% of new EP cases out of all new cases	No. of smear positive retreatment cases registered for treatment	% of retreatment cases out of all smear positive cases	No. (%) of paediatric cases out of all new cases	3 month conversion rate of new smear positive patients <sup>δ</sup>	Cure rate of new smear positive patients <sup>ε</sup>	Success rate of new smear positive patients <sup>ε</sup>	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	
Visakhapatnam	40	5183	130	2193	55 (73%)	55%	1794	662	14%	407	16%	70	94%	89%	91%	
Vizianagaram	24	3975	168	1788	76 (101%)	63%	1065	518	15%	539	23%	148	92%	88%	89%	
Warangal	34	4565	134	1940	57 (76%)	53%	1732	148	4%	702	27%	27	85%	73%	77%	
West Godavari	40	6218	156	2396	60 (80%)	51%	2260	401	8%	734	23%	212	95%	92%	92%	
<b>Arunachal Pradesh</b>																
Along DTC	1	132	116	50	44 (59%)	66%	26	13	15%	16	24%	1	96%	98%	98%	
Bomdila DTC	2	325	178	128	70 (93%)	65%	69	39	17%	54	30%	5	90%	96%	96%	
Deomali DTC	2	345	140	104	42 (56%)	50%	106	63	23%	29	22%	16	87%	77%	82%	
Pasighat DTC	1	333	252	123	93 (124%)	48%	131	19	7%	55	31%	7	98%	98%	98%	
Tezu DTC	2	341	155	174	79 (105%)	74%	62	25	10%	59	25%	10	94%	93%	93%	
Ziro DTC	3	870	289	220	73 (97%)	40%	332	113	17%	123	31%	40	96%	88%	88%	
<b>Assam</b>																
Barpeta	18	1290	73	489	28 (37%)	52%	458	107	10%	141	22%	36	86%	80%	87%	
Bongaigaon	10	942	97	359	37 (49%)	53%	318	41	6%	127	26%	15	84%	62%	71%	
Cachar	15	1221	79	456	30 (39%)	49%	468	78	8%	126	22%	33	84%	73%	80%	
Darrang	16	1542	96	619	38 (51%)	51%	586	83	6%	142	18%	39	88%	73%	74%	
Dhemaji	6	525	86	286	47 (62%)	65%	157	17	4%	21	6%	11	78%	78%	78%	
Dhubri	18	2154	123	801	46 (61%)	46%	934	67	4%	222	22%	31	77%	72%	82%	
Dibrugarh	13	2088	166	821	65 (87%)	64%	456	544	30%	194	19%	205	89%	85%	86%	
Goalpara	9	811	92	357	41 (54%)	61%	228	48	8%	85	19%	23	87%	69%	73%	
Golaghat	10	936	92	354	35 (47%)	51%	338	98	12%	102	22%	29	80%	67%	72%	
Hailakandi	6	511	88	221	38 (51%)	54%	186	20	5%	36	14%	5	80%	69%	71%	
Jorhat	11	1010	93	404	37 (50%)	58%	292	132	16%	103	20%	52	85%	73%	80%	

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Kamrup	27	2925	109	1110	41	58%	805	256	12%	453	29%	79	84%	80%	80%
Karbi Anglong	9	1435	165	446	51	(68%)	593	112	10%	117	20%	54	72%	64%	76%
Karimganj	11	882	82	310	29	(38%)	335	54	8%	66	18%	12	84%	63%	69%
Kokrajhar	10	1307	131	524	53	(70%)	670	31	3%	48	8%	55	90%	65%	72%
Lakhimpur	10	1035	109	421	44	(59%)	385	88	10%	89	17%	30	86%	80%	82%
Marigaon	8	900	108	328	39	(53%)	330	24	4%	111	25%	13	90%	84%	85%
Nagaon	25	1831	74	843	34	(45%)	702	66	4%	173	17%	38	91%	86%	86%
Nalbari	12	1150	94	554	45	(61%)	345	58	6%	113	17%	30	88%	75%	82%
North Cachar Hills	2	195	98	62	31	(41%)	72	14	9%	34	35%	10	89%	82%	88%
Sibsagar	11	844	75	372	33	(44%)	141	157	23%	119	24%	58	84%	60%	69%
Sonitpur	18	2562	143	1028	57	(76%)	982	203	9%	245	19%	35	85%	82%	85%
Tinsukia	12	1398	113	665	54	(72%)	263	262	22%	168	20%	84	85%	70%	77%
<b>Bihar</b>															
Araria	23	276	47	111	15	(20%)	191	10	3%	73	39%	0	32%		
Arwal	7	231	46	48	10	(13%)	111	9	5%	57	44%	5	62%		
Aurangabad-BI	22	456	82	146	18	(23%)	180	25	7%	62	30%	12	77%		
Begusarai	26	1476	76	305	16	(21%)	872	44	4%	129	30%	59	71%		
Bhagalpur	27	1673	83	480	22	(29%)	831	60	4%	144	23%	95	79%		
Bhojpur	25	236	38	64	8	(11%)	106	32	16%	8	11%	6	100%		
Buxar	16	402	35	74	6	(8%)	228	13	4%	31	25%	10	91%		
Darbhanga	36	310		81			121	28	12%	60	43%	5			
Gaya	38	1934	50	516	13	(18%)	819	65	5%	284	36%	36	60%		
Gopalganj	24	6		1			3	0	0%	2	67%	0			
Jehanabad	10	593	59	179	18	(24%)	309	21	4%	60	25%	21	69%		
Katihar	26	1657	63	839	32	(42%)	565	39	3%	190	18%	116	86%	81%	82%
Madhubani	39	89		40			22	3	5%	24	38%	1			
Munger	13	918	73	247	20	(26%)	474	71	9%	71	22%	47	72%	66%	80%
Muzaffarpur	41	3541	86	1003	24	(32%)	2084	140	4%	187	16%	48	88%	87%	92%
Nalanda	26	442	68	30	3	(4%)	252	16	5%	47	53%	1	89%		
Nawada	20	365	73	113	14	(18%)	150	8	3%	67	37%	7	80%		
Patna	52	5478	105	1796	35	(46%)	2628	406	8%	320	15%	549	84%	85%	89%
Purba Champaran	43	1122	34	509	16	(21%)	363	24	3%	89	13%	17	46%		
Purnia	28	1428	51	380	14	(18%)	749	38	3%	182	32%	35	83%	100%	100%
Samastipur	38	2350	83	570	20	(26%)	1223	83	4%	220	27%	83	74%		
Vaishali	30	3029	101	673	22	(30%)	1525	242	10%	272	28%	125	89%	90%	91%

(Contd.)

## Annual Performance of Districts (Contd...)

District	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
		Population covered by RNTCP <sup>a</sup> (in lakh)	Total patients registered for treatment <sup>y</sup>	Annual total case detection rate per lakh	New smear positive patients registered for treatment	Annual new smear positive case detection rate per lakh (%)	% new sputum positive out of total new pulmonary cases	No. of new smear negative cases registered for treatment	No. of new EP cases registered for treatment	% of new EP cases out of all new cases	No. of smear positive retreatment cases registered for treatment	% of retreatment cases out of all smear positive cases	No. (%) of paediatric cases out of all new cases	3 month conversion rate of new smear positive patients <sup>d</sup>	Cure rate of new smear positive patients <sup>e</sup>	Success rate of new smear positive patients <sup>e</sup>
<b>Chandigarh</b>																
Chandigarh	10	2478	240	746	72	(76%)	57%	574	691	34%	290	28%	320	16%	89%	89%
<b>Chhattisgarh</b>																
Bastar	14	1624	117	629	45	(56%)	50%	629	134	10%	132	17%	30	2%	79%	80%
Bilaspur-CG	21	2124	100	883	41	(52%)	56%	694	293	16%	215	20%	105	6%	90%	87%
Dantewada	8	903	118	623	81	(101%)	77%	190	30	4%	52	8%	11	1%	69%	68%
Dhamtari	8	707	94	350	47	(58%)	65%	192	83	13%	75	18%	15	2%	93%	90%
Durg	30	3294	110	1190	40	(50%)	45%	1428	497	16%	138	10%	160	5%	92%	88%
Janjgir	14	1421	101	502	36	(45%)	40%	761	73	5%	52	9%	26	2%	84%	87%
Jashpur	8	737	93	345	44	(55%)	53%	308	31	5%	28	7%	5	1%	79%	85%
Kanker	7	954	137	485	70	(87%)	61%	307	72	8%	69	12%	14	2%	90%	88%
Kawardha	6	573	92	232	37	(46%)	53%	209	33	7%	53	18%	31	7%	86%	78%
Korba	11	928	86	518	48	(60%)	71%	213	98	12%	86	14%	51	6%	77%	84%
Koriya	6	599	96	227	36	(45%)	49%	235	48	9%	44	16%	12	2%	86%	84%
Mahasamund	9	952	104	397	43	(54%)	49%	421	71	8%	50	11%	38	4%	88%	84%
Raigarh-CG	14	1767	131	657	49	(61%)	43%	854	26	2%	118	15%	57	4%	92%	83%
Raipur	32	3358	104	1378	43	(54%)	50%	1354	309	10%	255	16%	121	4%	91%	86%
Rajnandgaon	14	1829	134	661	48	(60%)	52%	621	291	18%	170	20%	200	13%	87%	87%
Surguuja	21	1760	84	627	30	(37%)	44%	786	119	8%	94	12%	43	3%	86%	83%
<b>D &amp; N Haveli</b>																
Dadra & Nagar Haveli	3	141	213	80	69	(87%)	78%	22	22	18%	16	16%	2	2%	65%	

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	
<b>Daman &amp; Diu</b>																
Daman	1	133	392	55	97	(122%)	69%	25	13	14%	23	29%	5	5%	97%	
Diu	1	25	190	16	69	(86%)	89%	2	1	5%	5	24%	0	0%	100%	
<b>Delhi</b>																
BIRM Chest Clinic	4	1255	289	409	94	(99%)	65%	221	311	33%	204	33%	148	16%	92%	88%
DDU Chest Clinic	15	4521	298	1064	70	(74%)	50%	1071	1428	40%	501	32%	440	12%	92%	88%
GTB Chest Clinic	5	1715	316	460	85	(89%)	65%	246	517	42%	233	32%	237	19%	90%	87%
Gulabi Bagh	12	1871	157	604	51	(53%)	65%	329	521	36%	272	30%	155	11%	92%	88%
Hedgewar C Clinic	4	2509	578	515	119	(125%)	47%	581	824	43%	217	30%	327	17%	92%	90%
Jhandewalan	5	1411	260	402	74	(78%)	61%	256	337	34%	223	34%	113	11%	91%	87%
Karawal Nagar	7	3273	503	1021	157	(165%)	64%	567	1005	39%	364	26%	429	17%	90%	86%
Kingsway	5	1390	256	451	83	(88%)	59%	319	358	32%	217	32%	42	4%	92%	88%
LN Chest Clinic	3	462	142	138	42	(45%)	73%	52	174	48%	63	31%	64	18%	88%	91%
LRS	15	4611	304	1311	86	(91%)	59%	914	1307	37%	659	33%	583	17%	91%	88%
Moti Nagar	5	1288	238	296	55	(57%)	52%	278	434	43%	143	33%	165	16%	93%	85%
Narela	7	1228	189	360	55	(58%)	58%	262	323	34%	204	36%	165	17%	90%	87%
NDMC	5	824	152	222	41	(43%)	67%	109	250	43%	103	26%	66	11%	91%	86%
NDTC	2	679	313	147	68	(71%)	52%	138	192	40%	82	35%	90	19%	93%	82%
Nehru Nagar	15	3731	246	1138	75	(79%)	61%	730	1038	36%	553	33%	411	14%	89%	84%
Patparganj	7	2732	420	843	130	(136%)	62%	507	801	37%	391	32%	357	17%	88%	85%
RK Mission	7	1659	255	559	86	(90%)	61%	354	437	32%	204	26%	157	12%	93%	89%
RTRM Chest Clinic	11	1453	134	477	44	(46%)	61%	304	332	30%	224	32%	141	13%	89%	89%
SGM Chest Clinic	14	5064	359	1291	92	(96%)	53%	1165	1461	37%	702	35%	485	12%	93%	89%
Shahadra	5	2589	478	623	115	(121%)	54%	536	832	42%	266	29%	308	15%	89%	82%
SPM Marg	5	1452	268	372	69	(72%)	53%	330	404	37%	183	33%	130	12%	90%	89%
<b>Goa</b>																
North Goa	8	1029	128	384	48	(60%)	54%	327	168	19%	91	19%	14	2%	82%	75%
South Goa	6	702	113	220	35	(44%)	51%	215	114	21%	86	27%	47	9%	81%	73%
<b>Gujarat</b>																
Ahmadabad	25	3171	128	1237	50	(62%)	62%	747	404	17%	525	29%	102	4%	89%	83%
AMC	38	8953	235	2475	65	(81%)	65%	1348	1938	34%	1987	44%	422	7%	88%	85%
Amreli	15	1426	94	611	40	(51%)	71%	244	206	19%	334	35%	49	5%	88%	85%

(Contd.)

## Annual Performance of Districts (Contd...)

District	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	Popu- lation (in lakh)	Total patients registered for treat- ment <sup>Y</sup>	Annual total case de- tection rate per lakh	New smear positive patients regis- tered for treat- ment	Annual new smear positive case detection rate per lakh (%)	% new sputum positive out of total new pul- monary cases	No. of new smear negative cases regis- tered for treat- ment	No. of new EP cases regis- tered for treat- ment	% of new EP cases out of all new cases	No. of new paediatric cases out of all new cases	% of re- treat- ment cases out of all smear positive cases	No. (%) of paediatric cases out of all new cases	3 month conver- sion rate of new smear positive pati- ents <sup>δ</sup>	Cure rate of new smear positive pati- ents <sup>ε</sup>	Success rate of new smear positive patients <sup>ε</sup>
Anand	20	2966	147	1237	61 (77%)	69%	561	258	13%	741	37%	63	92%	89%	89%
Banas Kantha	27	4136	152	1353	50 (62%)	55%	1117	336	12%	944	41%	145	84%	81%	83%
Bharuch	20	2587	127	1320	65 (81%)	72%	503	237	12%	428	24%	73	92%	87%	88%
Bhavnagar	27	3878	145	1262	47 (59%)	61%	799	569	22%	842	39%	256	87%	83%	83%
Chhota Udepur	10	1235	125	600	61 (76%)	81%	138	86	10%	331	35%	31	93%	86%	87%
Dahod	18	3097	175	1385	78 (98%)	75%	464	164	8%	916	40%	134	93%	86%	86%
Gandhinagar	14	1809	125	814	56 (70%)	74%	287	233	17%	339	29%	46	93%	83%	83%
Jamnagar	21	2229	107	828	40 (50%)	68%	387	460	27%	442	35%	203	91%	87%	88%
Junagadh	32	3702	114	1499	46 (58%)	64%	836	368	14%	701	31%	144	90%	86%	87%
Kachchh	17	1469	89	549	33 (41%)	68%	253	103	11%	454	45%	21	88%	75%	77%
Kheda	22	2952	135	1271	58 (72%)	70%	538	177	9%	846	40%	50	91%	86%	86%
Mahesana	20	2743	138	1260	63 (79%)	64%	712	246	11%	402	24%	53	93%	87%	87%
Panch Mahals	22	4374	199	1834	84 (104%)	65%	991	179	6%	979	35%	66	93%	84%	84%
Patan	13	1808	141	701	55 (68%)	59%	491	86	7%	400	36%	35	90%	82%	82%
Rajkot	34	3610	105	1581	46 (58%)	71%	642	527	19%	671	30%	108	92%	87%	87%
Sabar Kantha	23	3738	165	1406	62 (78%)	62%	869	379	14%	795	36%	99	92%	86%	87%
Surat	16	2238	136	960	58 (73%)	72%	370	335	20%	374	28%	83	92%	83%	84%
Surat Municipal Corp	26	4168	158	1371	52 (65%)	64%	778	833	28%	649	32%	339	89%	85%	85%
Surendranagar	16	1850	113	742	45 (56%)	64%	420	198	15%	357	32%	49	89%	86%	88%
The Dangs	2	230	114	120	59 (74%)	68%	56	8	4%	19	13%	10	97%	90%	90%
Vadodara	15	1888	122	851	55 (69%)	70%	373	142	10%	384	31%	17	91%	85%	86%
Vadodara Corp	14	1927	136	824	58 (73%)	73%	302	264	19%	418	34%	26	90%	86%	86%
Valsad	29	3194	112	1382	48 (60%)	67%	690	412	17%	456	24%	239	90%	84%	85%
Vyara(Surat)	11	1709	150	816	72 (90%)	63%	482	62	5%	252	23%	42	91%	85%	88%



(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
<b>Haryana</b>															
Ambala	11	1222	109	427	38	(40%)	267	247	26%	213	33%	34	4%	86%	82%
Bhiwani	16	2541	162	964	61	(65%)	721	210	11%	588	38%	95	5%	87%	86%
Fariidabad	24	4093	169	1287	53	(56%)	1283	796	24%	552	30%	181	5%	87%	83%
Fatehabad	9	1138	128	485	54	(57%)	258	90	11%	258	35%	31	4%	88%	76%
Gurgaon	18	2794	153	1068	58	(61%)	357	408	22%	780	42%	127	7%	86%	75%
Hisar	17	2311	136	921	54	(57%)	429	255	16%	649	40%	89	6%	83%	77%
Jhajjar	10	1404	143	589	60	(63%)	330	217	19%	232	28%	24	2%	88%	83%
Jind	13	1908	145	793	60	(64%)	289	309	22%	436	35%	66	5%	87%	83%
Kaithal	10	1494	143	609	58	(61%)	318	143	13%	348	36%	43	4%	80%	74%
Karnal	14	1908	136	774	55	(58%)	362	295	21%	415	35%	98	7%	87%	84%
Kurukshetra	9	1083	118	362	40	(42%)	288	171	21%	179	32%	45	5%	86%	77%
Mahendragarh	9	1188	133	397	44	(47%)	298	166	19%	226	36%	71	8%	92%	82%
Panchkula	5	906	175	321	62	(65%)	139	244	35%	132	29%	58	8%	89%	81%
Panipat	11	1887	177	600	56	(59%)	483	279	20%	282	32%	64	5%	85%	91%
Rewari	8	1019	121	350	41	(44%)	195	159	23%	245	41%	35	5%	82%	79%
Rohtak	10	1852	178	662	64	(67%)	359	423	29%	344	34%	90	6%	94%	89%
Sirsa	12	1750	143	701	57	(60%)	265	205	18%	419	37%	61	5%	84%	74%
Sonipat	14	2522	179	768	54	(57%)	911	341	17%	365	31%	104	5%	86%	87%
Yamunanagar	11	1496	138	591	54	(57%)	396	254	20%	188	24%	65	5%	83%	79%
<b>Himachal Pradesh</b>															
Bilaspur-HP	4	629	173	286	79	(83%)	116	79	16%	131	31%	4	1%	93%	93%
Chamba	5	1195	243	386	79	(83%)	273	296	31%	199	33%	53	6%	92%	91%
Hamirpur-HP	4	714	162	276	63	(66%)	146	159	27%	107	28%	8	1%	93%	90%
Kangra	14	2613	183	918	64	(68%)	550	608	29%	408	30%	31	1%	92%	88%
Kinnaur	1	186	208	63	70	(74%)	29	35	28%	34	33%	5	4%	87%	83%
Kullu	4	1588	392	442	109	(115%)	460	388	30%	234	34%	53	4%	89%	90%
Lahul & Spiti	0	80	226	25	71	(74%)	15	18	31%	8	22%	0	0%	95%	100%
Mandi	10	2177	227	746	78	(82%)	454	446	27%	425	36%	23	1%	93%	88%
Shimla	8	1760	229	561	73	(77%)	302	568	40%	197	25%	70	5%	94%	91%
Sirmaur	5	1058	216	394	81	(85%)	153	250	31%	152	25%	34	4%	90%	88%
Solan	5	1009	189	459	86	(91%)	131	195	25%	171	27%	25	3%	91%	89%
Una	5	688	144	276	58	(61%)	134	97	19%	145	34%	4	1%	86%	89%

(Contd.)

Annual Performance of Districts (Contd...)

District	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
		Population covered by RNTCP <sup>α</sup> (in lakh)	Total patients registered for treatment <sup>γ</sup>	Annual total case detection rate per lakh	New smear positive patients registered for treatment	Annual new smear positive case detection rate per lakh (%)	% new sputum positive out of total new pulmonary cases	No. of new smear negative cases registered for treatment	No. of new EP cases registered for treatment	% of new EP cases out of all new cases	No. of smear positive retreatment cases registered for treatment	% of retreatment cases out of all smear positive cases	No. (%) of paediatric cases out of all new cases	3 month conversion rate of smear positive patients <sup>δ</sup>	Cure rate of new smear positive patients <sup>ε</sup>	Success rate of new smear positive patients <sup>ε</sup>
<b>Jammu &amp; Kashmir</b>																
Anantanag	13	115	36	81	13 (14%)	73%	30	47	30%	5	10%	4	4%	89%		
Badgam	7	111	34	77	15 (16%)	75%	26	78	43%	10	11%	4	4%	90%		
Baramula	13	414	64	167	20 (21%)	78%	46	141	40%	45	21%	18	5%	90%		
Doda	8	179	94	57	27 (29%)	55%	47	44	30%	31	35%	7	5%	60%		
Jammu	17	1739	100	618	36 (37%)	50%	614	349	22%	136	18%	18	1%	87%	86%	86%
Kargil	1	19	60	6	19 (20%)	40%	9	3	17%	1	14%	0	0%			
Kathua	6	151	100	46	31 (32%)	42%	63	16	13%	16	26%	3	2%			
Kupwara	7	412	116	130	21 (22%)	59%	91	142	39%	34	21%	12	3%	93%		
Leh	1	36	111	19	18 (19%)	50%	19	45	54%	2	25%	0	0%	62%		
Poonch	4	108	105	23	21 (23%)	38%	38	31	34%	9	28%	6	7%	100%		
Pulwama	7	388	55	167	24 (25%)	58%	120	84	23%	9	5%	7	2%	91%	86%	86%
Rajouri	5	78	59	33	25 (26%)	87%	5	26	41%	11	25%	0	0%			
Srinagar	14	583	43	188	14 (14%)	59%	128	204	39%	36	16%	17	3%	89%	86%	86%
Udhampur	8	145	71	57	28 (29%)	69%	26	32	28%	24	29%	1	1%			
<b>Jharkhand</b>																
Bokaro	19	1419	98	526	36 (48%)	43%	703	78	6%	60	10%	34	3%	86%		
Chatra	9	602	70	224	26 (35%)	45%	270	6	1%	69	24%	4	1%	82%	89%	89%
Deochar	13	1026	81	451	36 (48%)	54%	382	27	3%	125	22%	35	4%	92%	88%	90%
Dhanbad	26	2240	86	690	27 (35%)	40%	1052	68	4%	221	24%	82	5%	91%	84%	90%
Dumka	12	1569	131	744	62 (83%)	57%	561	4	0%	211	22%	64	5%	77%	83%	94%
Garhwa	11	1379	123	448	40 (53%)	39%	709	43	4%	115	20%	79	7%	83%	53%	86%
Giridih	21	704	136	295	31 (42%)	52%	273	25	4%	99	25%	16	3%	88%		

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	
	Godda	11	443	156	279	53	(71%)	69%	126	9	2%	7	2%	5	1%	89%
	Gumla	9	676	75	217	24	(32%)	40%	322	20	4%	35	13%	19	3%	83%
	Hazaribagh	25	1998	81	683	28	(37%)	40%	1025	82	5%	173	20%	62	3%	82%
	Jamtara	7	769	108	282	40	(53%)	47%	315	11	2%	102	27%	20	3%	89%
	Kodarma	5	206	51	14	3	(5%)	11%	116	5	4%	0	0%	1	1%	38%
	Lathehar	6	766	121	384	61	(81%)	62%	240	64	9%	72	16%	43	6%	88%
	Lohardaga	4	386	97	160	40	(54%)	59%	112	31	10%	60	27%	25	8%	85%
	Pakaur	8	476	125	235	55	(73%)	64%	130	6	2%	90	28%	0	0%	67%
	Palamu	16	2462	150	903	55	(73%)	45%	1111	239	11%	177	16%	148	7%	95%
	Pashchimi Singhbhum	14	1533	108	538	38	(51%)	40%	793	43	3%	137	20%	11	1%	70%
	Purbi Singhbhum	22	2293	107	977	45	(61%)	53%	857	181	9%	239	20%	67	3%	88%
	Ranchi	30	3414	113	977	32	(43%)	41%	1405	461	16%	188	14%	130	4%	91%
	Sahibganj	10	621	246	202	40	(53%)	39%	317	14	3%	51	20%	4	1%	81%
	Saraikeela-Kharsawan	8	821	97	349	41	(55%)	50%	350	16	2%	65	15%	14	2%	87%
	Simdega	6	375	66	164	29	(39%)	52%	151	17	5%	25	13%	2	1%	77%
	<b>Karnataka</b>															
	Bagalkot	18	1963	111	742	42	(56%)	50%	748	218	13%	210	22%	86	5%	86%
	Bangalore City	44	7352	165	2287	51	(69%)	60%	1517	1914	33%	1000	30%	430	8%	75%
	Bangalore Rural	20	2346	117	926	46	(62%)	59%	654	426	21%	241	21%	52	3%	91%
	Bangalore U	25	3142	125	1052	42	(56%)	59%	722	783	31%	377	26%	171	7%	89%
	Belgaum	45	4628	103	1924	43	(57%)	59%	1363	725	18%	447	19%	318	8%	88%
	Bellary	22	3062	142	1428	66	(88%)	64%	813	395	15%	357	20%	210	8%	90%
	Bidar	16	1440	90	581	36	(48%)	58%	413	84	8%	301	33%	21	2%	85%
	Bijapur	19	2142	111	788	41	(55%)	49%	819	172	10%	272	25%	82	5%	75%
	Chamarajanagar	10	1519	148	633	62	(82%)	68%	301	272	23%	246	28%	89	7%	87%
	Chikmagalur	12	1437	118	513	42	(56%)	61%	334	345	29%	174	25%	81	7%	89%
	Chitradurga	16	2264	141	1068	66	(88%)	58%	777	222	11%	191	15%	69	3%	89%
	Dakshina Kannada	20	2196	109	912	45	(60%)	69%	409	372	22%	345	27%	64	4%	87%
	Davanagere	19	2461	129	833	44	(58%)	51%	805	391	19%	284	25%	94	5%	89%
	Dharwad	17	2052	120	728	43	(57%)	66%	369	570	34%	313	30%	124	7%	84%
	Gadag	10	1056	102	412	40	(53%)	69%	184	112	16%	226	33%	29	4%	74%
	Gulbarga	33	3623	109	1303	39	(52%)	51%	1254	235	8%	566	30%	109	4%	74%
	Hassan	18	2050	112	880	48	(64%)	68%	420	399	23%	244	22%	45	3%	91%
	Haveri	15	1658	108	662	43	(58%)	57%	500	217	16%	217	25%	54	4%	88%

(Contd.)

Annual Performance of Districts (Contd...)

District	Population covered by RNTCP <sup>a</sup> (in lakh)	Total patients registered for treatment <sup>y</sup>	Annual total case detection rate per lakh	New smear positive patients registered for treatment	Annual new smear positive case detection rate per lakh (%)	% new sputum positive out of total new pulmonary cases	No. of new smear negative cases registered for treatment	No. of new EP cases registered for treatment	% of new EP cases out of all new cases	No. of smear positive retreatment cases registered for treatment	% of retreatment cases out of all smear positive cases	No. (%) of paediatric cases out of all new cases	3 month conversion rate of new smear positive patients <sup>δ</sup>	Cure rate of new smear positive patients <sup>ε</sup>	Success rate of new smear positive patients <sup>ε</sup>
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Kodagu	6	559	96	220	38 (50%)	58%	160	97	20%	50	19%	44	85%	85%	86%
Kolar	27	3340	124	1470	55 (73%)	62%	909	520	18%	313	17%	118	82%	84%	85%
Koppal	13	1792	141	651	51 (68%)	52%	595	132	10%	296	31%	77	91%	86%	86%
Mandya	19	2543	135	1081	58 (77%)	63%	640	436	20%	296	21%	95	90%	88%	89%
Mysore	28	3762	134	1497	54 (71%)	61%	975	698	22%	447	23%	210	89%	81%	82%
Raichur	18	3047	173	1289	73 (98%)	57%	978	179	7%	492	28%	89	87%	84%	84%
Shimoga	17	1878	107	580	33 (44%)	40%	856	238	14%	163	22%	94	91%	84%	84%
Tumkur	27	3097	113	1272	46 (62%)	67%	623	613	24%	411	24%	164	84%	83%	83%
Udupi	12	1242	105	485	41 (55%)	67%	238	209	22%	211	30%	61	83%	85%	86%
Uttara Kannada	14	1044	72	395	27 (37%)	55%	323	138	16%	118	23%	20	83%	74%	76%
<b>Kerala</b>															
Alappuzha	22	1788	82	741	34 (45%)	62%	452	397	25%	146	16%	55	87%	87%	90%
Ernakulam	32	2598	81	1117	35 (46%)	64%	628	496	22%	262	19%	31	82%	86%	88%
Idukki	12	684	58	287	25 (33%)	70%	122	216	35%	36	11%	16	84%	89%	90%
Kannur	25	1869	75	757	30 (40%)	70%	319	567	35%	167	18%	42	87%	86%	87%
Kasaragod	12	955	77	437	35 (47%)	73%	163	215	26%	113	20%	47	88%	81%	84%
Kollam	27	1997	75	926	35 (46%)	65%	489	373	21%	160	15%	76	89%	86%	87%
Kottayam	20	1899	94	960	47 (63%)	80%	233	316	21%	130	15%	15	84%	82%	85%
Kozhikode	30	2424	81	974	33 (44%)	65%	527	654	30%	188	16%	187	85%	85%	88%
Malappuram	38	2425	64	947	25 (34%)	59%	658	570	26%	187	16%	124	87%	84%	87%
Palakkad	27	2111	78	1017	37 (50%)	74%	360	514	27%	177	15%	49	87%	86%	88%
Pathanamthitta	13	875	69	450	35 (47%)	80%	114	241	30%	39	8%	16	88%	87%	88%
Thiruvananthapuram	34	2510	75	1173	35 (47%)	69%	520	515	23%	208	15%	181	83%	83%	86%

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Thrissur	31	2240	73	1080	35	(4.7%)	294	589	30%	212	16%	59	3%	84%	86%
Wayanad	8	699	86	279	34	(4.6%)	215	164	25%	30	10%	148	22%	82%	91%
<b>Lakshadweep</b>															
Lakshadweep	1	4	25	0	0	(0%)	1	0	0%	0	0%	0	0%		
<b>Madhya Pradesh</b>															
Balaghat	16	1354	86	507	32	(40%)	442	154	14%	135	21%	13	1%	83%	75%
Barwani	12	884	75	420	36	(45%)	221	80	11%	153	27%	10	1%	82%	81%
Betul	15	985	65	427	28	(35%)	343	78	9%	131	23%	0	0%	64%	68%
Bhind	16	1979	127	553	36	(44%)	914	95	6%	323	35%	51	3%	69%	59%
Bhopal	20	3093	154	923	46	(58%)	1255	397	15%	257	21%	127	5%	93%	89%
Chhatarpur	16	1786	111	564	35	(44%)	734	36	3%	330	37%	6	0%	86%	74%
Chhindwara	20	1506	75	778	39	(48%)	269	199	16%	239	23%	82	7%	82%	83%
Damoh	12	1944	165	835	71	(88%)	533	183	12%	352	30%	10	1%	85%	86%
Datia	7	1044	152	449	66	(82%)	291	69	9%	216	32%	39	5%	87%	82%
Dewas	14	1325	93	434	30	(38%)	512	146	13%	155	26%	69	6%	91%	87%
Dhar	19	2155	113	869	46	(57%)	719	193	11%	303	26%	23	1%	91%	89%
Dindori	6	354	56	185	29	(37%)	42	66	23%	57	24%	8	3%	68%	82%
Guna	18	1970	108	804	44	(55%)	651	123	8%	310	27%	28	2%	83%	83%
Gwalior	18	2372	133	882	50	(62%)	615	205	12%	630	42%	110	6%	86%	73%
Harda	5	355	69	151	29	(36%)	109	41	14%	36	19%	7	2%	83%	82%
Hoshangabad	12	1531	129	559	47	(59%)	519	181	14%	230	29%	59	5%	94%	93%
Indore	28	2939	104	934	33	(41%)	656	656	29%	494	35%	154	7%	87%	77%
Jabalpur	24	2351	99	1109	47	(59%)	446	236	13%	499	31%	106	6%	80%	66%
Jhabua	15	1677	110	802	53	(66%)	507	106	7%	195	20%	58	4%	93%	91%
Katni	12	1439	124	666	57	(72%)	529	66	5%	175	21%	48	4%	82%	80%
Khandwa	19	1840	99	704	38	(4.7%)	778	160	10%	171	19%	44	3%	93%	90%
Khargone	17	2089	125	715	43	(54%)	786	298	17%	256	26%	77	4%	90%	85%
Mandla	10	977	100	460	47	(59%)	233	124	15%	116	20%	38	5%	83%	84%
Mandsaur	13	1666	129	642	50	(62%)	571	153	11%	240	27%	18	1%	86%	90%
Morena	17	2778	160	1124	65	(81%)	715	73	4%	694	38%	30	2%	80%	74%
Narsinghpur	10	984	94	389	37	(4.7%)	223	97	14%	198	33%	23	3%	80%	81%
Neemuch	8	1169	148	381	48	(60%)	416	127	14%	169	30%	49	5%	91%	87%
Panna	9	756	81	247	27	(33%)	169	35	8%	247	50%	11	2%	89%	82%
Raisen	12	1365	112	399	33	(4.1%)	619	53	5%	157	28%	12	1%	91%	89%

(Contd.)

Annual Performance of Districts (Contd...)

District	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	Popu- lation (in lakh)	Total patients registered for treat- ment <sup>Y</sup>	Annual total case de- tection rate per lakh	New smear positive patients regis- tered for treat- ment	Annual new smear positive case detection rate per lakh (%)	% new sputum positive out of total new pul- monary cases	No. of new smear negative cases regis- tered for treat- ment	No. of new EP cases regis- tered for treat- ment	% of new EP cases out of all new cases	No. of smear positive retreat- ment cases regis- tered for treat- ment	% of retreat- ment cases out of all smear positive cases	No. (%) of paediatric cases out of all new cases	3 month conver- sion rate of new smear positive pati- ents <sup>δ</sup>	Cure rate of new smear positive pati- ents <sup>ε</sup>	Success rate of new smear positive patients <sup>ε</sup>
Raigarh	14	1832	134	605	44 (55%)	49%	624	183	13%	138	16%	30	90%	83%	85%
Ratlam	13	1458	110	417	31 (39%)	49%	430	244	22%	224	35%	38	86%	75%	78%
Rewa	22	1703	79	593	28 (34%)	53%	528	174	13%	369	38%	39	87%	100%	100%
Sagar	22	2484	113	912	41 (52%)	46%	1067	184	9%	304	25%	139	88%	80%	84%
Satna	20	2318	114	781	38 (48%)	45%	947	209	11%	218	22%	24	82%	75%	82%
Sehore	12	1094	93	367	31 (39%)	44%	464	89	10%	44	10%	24	86%	81%	84%
Seoni	13	939	74	435	34 (43%)	74%	155	117	17%	218	33%	26	84%	79%	79%
Shahdol	17	1317	77	640	37 (47%)	59%	438	65	6%	120	16%	7	85%	78%	81%
Shajapur	14	1390	99	656	47 (58%)	67%	329	94	9%	252	28%	16	96%	91%	92%
Sheopur	6	1198	196	486	80 (99%)	57%	369	14	2%	273	34%	20	64%	71%	71%
Shivpuri	16	1899	121	908	58 (72%)	54%	782	29	2%	124	12%	2	81%	67%	73%
Sidhi	20	1711	86	805	40 (50%)	66%	417	84	6%	389	33%	37	85%	100%	100%
Tikamgarh	13	1233	94	520	40 (50%)	54%	438	82	8%	174	25%	19	80%	74%	77%
Ujjain	19	2105	113	794	43 (53%)	54%	665	264	15%	356	31%	69	90%	82%	84%
Umaria	6	462	82	218	39 (48%)	60%	146	31	8%	62	22%	18	84%	64%	73%
Vidisha	13	2525	191	753	57 (71%)	40%	1137	196	9%	285	27%	188	90%	87%	89%
<b>Maharashtra</b>															
Ahmadnagar	44	4699	106	2173	49 (61%)	60%	1419	532	13%	308	12%	139	92%	88%	88%
Akola	18	1934	109	859	49 (61%)	59%	592	206	12%	223	21%	72	91%	84%	88%
Amravati Mun Corp	6	846	142	303	51 (64%)	59%	211	152	23%	107	26%	34	90%	87%	88%
Amravati Rural	22	2633	118	883	40 (49%)	53%	772	389	19%	367	29%	72	87%	79%	84%
Aurangabad Muni Corp	9	1009	107	345	36 (46%)	63%	206	287	34%	125	27%	52	90%	85%	88%

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	
Aurangabad-MH	22	2408	108	1067	48	(60%)	55%	882	233	11%	189	15%	51	2%	94%	93%
Bhandara	12	1436	117	597	48	(61%)	58%	434	137	12%	210	26%	106	9%	91%	85%
Bid	23	2189	93	1020	44	(54%)	62%	622	279	15%	196	16%	83	4%	92%	86%
Buldana	24	3078	127	1257	52	(65%)	56%	985	230	9%	519	29%	81	3%	93%	87%
Chandrapur	23	2811	125	1055	47	(59%)	53%	950	348	15%	250	19%	77	3%	93%	87%
Dhule	19	2620	141	951	51	(64%)	52%	873	416	19%	280	23%	152	7%	91%	82%
Gadchiroli	11	1187	113	579	55	(69%)	65%	312	143	14%	100	15%	29	3%	89%	87%
Gondiya	13	1901	146	738	57	(71%)	58%	539	295	19%	213	22%	103	7%	90%	86%
Hingoli	11	1445	135	524	49	(61%)	46%	603	95	8%	148	22%	59	5%	84%	83%
Jalgaon	40	4590	115	1920	48	(60%)	52%	1773	515	12%	347	15%	133	3%	90%	86%
Jalna	17	2150	123	830	47	(59%)	53%	744	196	11%	297	26%	18	1%	84%	80%
Kalyan Dombivli MC	13	1849	143	597	46	(58%)	54%	510	351	24%	161	19%	32	2%	85%	79%
Kolhapur	33	3316	101	1589	48	(60%)	63%	924	406	14%	249	14%	123	4%	91%	87%
Kolhapur Mun Corp	5	618	117	215	41	(51%)	53%	191	105	21%	67	24%	19	4%	90%	85%
Latur	23	2363	105	1119	50	(62%)	56%	864	211	10%	147	12%	71	3%	91%	88%
Mumbai	129	26241	203	8123	63	(79%)	52%	7444	5410	26%	3174	28%	2366	11%	90%	86%
Nagpur Muni Corp	22	3357	151	1213	55	(68%)	68%	573	1024	36%	392	24%	95	3%	93%	84%
Nagpur Rural	22	2439	112	1234	57	(71%)	62%	745	169	8%	222	15%	14	1%	95%	90%
Nanded	26	3812	144	1376	52	(65%)	47%	1565	366	11%	355	20%	191	6%	93%	90%
Nanded Waghela MC	5	768	164	257	55	(69%)	52%	233	166	25%	65	20%	15	2%	91%	83%
Nandurbar	14	1952	137	760	54	(67%)	50%	755	195	11%	191	20%	24	1%	91%	84%
Nashik	42	6561	155	2586	61	(76%)	50%	2560	919	15%	369	12%	1039	17%	92%	89%
Nashik Corp	12	1350	116	516	44	(55%)	60%	348	308	26%	131	20%	115	10%	90%	85%
Navi Mumbai	8	1550	203	534	70	(87%)	61%	341	322	27%	203	28%	225	19%	87%	82%
Osmanabad	16	1656	104	722	45	(57%)	55%	586	153	10%	143	17%	84	6%	93%	90%
Parbhani	16	1884	116	693	43	(54%)	48%	748	189	12%	215	23%	82	5%	88%	83%
Pimpri Chinchwad	11	2044	187	725	66	(83%)	65%	392	484	30%	234	23%	94	6%	90%	88%
Pune	28	4148	151	1477	54	(67%)	60%	1003	985	28%	422	22%	110	3%	91%	86%
Pune Rural	40	4385	110	1861	47	(58%)	65%	1011	704	20%	569	23%	98	3%	93%	87%
Raigarh-MH	24	3602	151	1421	59	(74%)	55%	1165	356	12%	417	23%	76	3%	91%	87%
Ratnagiri	18	2767	150	989	54	(67%)	50%	985	225	10%	289	23%	73	3%	90%	86%
Sangli	23	2486	107	1031	44	(55%)	60%	683	351	17%	211	17%	111	5%	88%	84%
Sangli Muni Corp	5	649	137	227	48	(60%)	58%	163	150	28%	47	17%	38	7%	91%	88%
Satara	30	4148	137	1468	48	(60%)	50%	1492	516	15%	385	21%	133	4%	90%	87%

(Contd.)

## Annual Performance of Districts (Contd...)

District	Population covered by RNTCP <sup>a</sup> (in lakh)	Total patients registered for treatment <sup>y</sup>	Annual total case detection rate per lakh	New smear positive patients registered for treatment	Annual new smear positive case detection rate per lakh (%)	% new sputum positive out of total new pulmonary cases	No. of new smear negative cases registered for treatment	No. of new EP cases registered for treatment	% of new EP cases out of all new cases	No. of smear positive retreatment cases registered for treatment	% of retreatment cases out of all smear positive cases	No. (%) of paediatric cases out of all new cases	3 month conversion rate of new smear positive patients <sup>d</sup>	Cure rate of new smear positive patients <sup>e</sup>	Success rate of new smear positive patients <sup>e</sup>
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Sindhudurg	9	1372	147	464	50 (62%)	47%	519	146	13%	119	20%	20	83%	80%	83%
Solapur	32	2958	91	1518	47 (59%)	62%	945	217	8%	201	12%	69	91%	86%	87%
Solapur Muni Corp	9	1450	153	538	57 (71%)	53%	475	158	13%	154	22%	41	89%	83%	83%
Thane	49	7451	153	3080	63 (79%)	56%	2399	957	15%	624	17%	547	92%	91%	91%
Thane Muni Corp	14	2974	217	900	66 (82%)	62%	561	711	33%	426	32%	158	90%	85%	85%
Ulhasnagar Muni Corp	5	974	190	325	63 (79%)	45%	397	77	10%	125	28%	60	89%	86%	86%
Wardha	13	1826	137	726	54 (68%)	56%	560	333	21%	183	20%	90	91%	87%	88%
Washim	11	1272	115	467	42 (53%)	50%	468	121	11%	169	27%	31	86%	86%	86%
Yavatmal	27	3406	128	1257	47 (59%)	51%	1195	424	15%	454	27%	211	89%	85%	86%
<b>Manipur</b>															
Bishnupur	2	353	154	101	44 (59%)	52%	94	71	27%	14	11%	7	94%	87%	88%
Chandel	1	215	158	56	41 (55%)	43%	73	38	23%	25	31%	10	93%	87%	87%
Churachandpur	3	985	388	117	46 (61%)	21%	453	171	23%	45	28%	222	86%	85%	85%
Imphal East	4	824	188	198	45 (60%)	41%	285	178	27%	70	23%	34	90%	86%	86%
Imphal West	5	975	200	267	55 (73%)	46%	317	252	30%	62	19%	37	94%	87%	87%
Senapati	4	392	93	84	20 (27%)	41%	122	92	31%	30	23%	47	93%	90%	90%
Tamenglong	1	83	67	30	24 (32%)	60%	20	10	17%	13	28%	0	79%	78%	78%
Thoubal	4	626	154	145	36 (48%)	38%	240	111	22%	57	28%	13	89%	86%	86%
Ukhrul	2	186	119	47	30 (40%)	48%	50	45	32%	11	16%	11	74%	78%	78%
<b>Meghalaya</b>															
E Khasi Hills	7	879	120	182	25 (33%)	47%	202	231	38%	114	37%	65	85%	62%	63%
East Garo Hills	3	176	64	82	30 (40%)	68%	38	14	10%	17	17%	11	84%	61%	72%
Jaintia Hills	3	396	121	121	37 (49%)	50%	122	74	23%	56	31%	0	83%	71%	76%



(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	
Ri Bhoi	2	136	64	47	22	(29%)	63%	28	30	29%	23	33%	4	4%	64%	65%
South Garo Hills	1	14	13	8	7	(10%)	73%	3	1	8%	1	11%	0	0%	100%	78%
West Garo Hills	6	786	137	336	59	(78%)	58%	241	45	7%	82	20%	30	5%	84%	80%
West Khasi Hills	3	566	173	181	55	(74%)	57%	136	104	25%	89	33%	64	15%	90%	87%
<b>Mizoram</b>																
Aizawl	4	946	251	208	55	(74%)	45%	250	340	43%	86	28%	44	6%	96%	85%
Champhai	1	110	98	30	27	(36%)	28%	76	33	24%	14	32%	12	14%	100%	81%
Kolasib	1	210	311	96	142	(190%)	59%	66	22	12%	11	10%	10	5%	93%	93%
Lawngtlai	1	89	110	46	57	(76%)	78%	13	14	19%	12	20%	2	3%	73%	79%
Lunglei	2	286	188	91	60	(80%)	49%	93	47	20%	47	32%	10	4%	97%	83%
Mamit	1	37	54	17	25	(33%)	61%	11	4	13%	4	18%	1	3%	95%	92%
Saiha	1	169	251	38	56	(75%)	38%	63	34	25%	10	19%	9	7%	97%	89%
Serchhip	1	68	111	25	41	(54%)	50%	25	14	22%	3	11%	11	17%	100%	100%
<b>Nagaland</b>																
Dimapur	4	721	192	216	57	(77%)	42%	301	47	8%	101	32%	26	5%	83%	73%
Kohima	4	414	108	136	35	(47%)	59%	95	89	28%	55	29%	26	8%	90%	81%
Mokokchung	3	265	96	114	41	(55%)	78%	33	42	22%	55	33%	8	4%	90%	89%
Mon	3	442	140	135	43	(57%)	62%	82	115	35%	81	38%	59	18%	91%	96%
Phek	2	184	102	64	35	(47%)	67%	32	68	41%	20	24%	21	13%	90%	80%
Tuensang	5	690	136	203	40	(53%)	53%	182	171	31%	67	23%	85	15%	98%	92%
Wokha	2	120	61	57	29	(39%)	59%	39	7	7%	16	22%	1	1%	89%	98%
Zunheboto	2	98	52	32	17	(23%)	56%	25	19	25%	17	35%	3	4%	100%	88%
<b>Orissa</b>																
Anugul	12	992	82	478	40	(47%)	70%	201	172	20%	103	18%	56	7%	90%	80%
Balangir	14	2310	163	924	65	(77%)	48%	1003	220	10%	41	4%	70	3%	88%	69%
Baleshwar	21	1595	74	695	32	(38%)	61%	440	181	14%	144	17%	15	1%	79%	67%
Bargarh	14	1454	102	680	48	(56%)	57%	508	158	12%	65	9%	21	2%	79%	87%
Baoudh	4	433	109	204	52	(61%)	65%	109	57	15%	22	10%	23	6%	89%	89%
Bhadrak	14	786	56	290	21	(24%)	61%	188	200	29%	53	15%	30	4%	90%	88%
Bhubaneswar Corp	7	694	101	291	42	(50%)	83%	59	198	36%	126	30%	30	5%	86%	
Cuttack	25	1879	76	747	30	(35%)	70%	324	437	29%	246	24%	58	4%	66%	73%
Debagarh	3	222	76	116	40	(47%)	69%	52	28	14%	16	12%	8	4%	90%	83%
Dhenkanal	11	1152	102	467	41	(49%)	57%	357	198	19%	77	14%	51	5%	92%	88%

(Contd.)

## Annual Performance of Districts (Contd...)

District	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
		Population covered by RNTCP <sup>a</sup> (in lakh)	Total patients registered for treatment <sup>y</sup>	Annual total case detection rate per lakh	New smear positive patients registered for treatment	Annual new smear positive case detection rate per lakh (%)	% new sputum positive out of total new pulmonary cases	No. of new smear negative cases registered for treatment	No. of new EP cases registered for treatment	% of new EP cases out of all new cases	No. of smear positive retreatment cases registered for treatment	% of retreatment cases out of all smear positive cases	No. (%) of paediatric cases out of all new cases	3 month conversion rate of new smear positive patients <sup>δ</sup>	Cure rate of new smear positive patients <sup>ε</sup>	Success rate of new smear positive patients <sup>ε</sup>
Gajapati	6	1014	184	473	86 (101%)	61%	305	123	14%	78	14%	82	9%	73%	56%	75%
Ganjam	33	5157	155	2160	65 (76%)	59%	1504	714	16%	520	19%	193	4%	74%	60%	74%
Jagatsinghapur	11	463	41	262	23 (27%)	81%	62	90	22%	35	12%	4	1%	92%	83%	83%
Jajapur	17	1359	79	602	35 (41%)	63%	348	281	23%	72	11%	38	3%	89%	81%	89%
Jharsuguda	5	737	136	288	53 (63%)	55%	240	141	21%	37	11%	35	5%	90%	84%	89%
Kalahandi	14	2099	148	1136	80 (94%)	72%	446	278	15%	178	14%	60	3%	79%	69%	82%
Kandhamal	7	740	108	427	62 (73%)	80%	108	106	17%	78	15%	51	8%	79%	71%	82%
Kendrapara	14	769	56	288	21 (25%)	58%	207	153	24%	60	17%	3	0%	90%	87%	91%
Kendujhar	17	2410	145	1106	67 (79%)	65%	602	409	19%	160	13%	65	3%	92%	87%	89%
Khordha	13	1262	97	457	35 (41%)	50%	457	175	16%	108	19%	66	6%	84%	72%	77%
Koraput	12	1313	105	682	55 (64%)	75%	230	214	19%	118	15%	29	3%	80%	72%	86%
Malkangiri	5	899	176	590	116 (136%)	78%	163	38	5%	68	10%	16	2%	76%	72%	83%
Mayurbhanj	24	4412	187	2130	90 (106%)	60%	1422	564	14%	155	7%	94	2%	93%	84%	88%
Nabarangapur	11	1059	98	575	53 (63%)	65%	311	62	7%	69	11%	15	2%	88%	88%	89%
Nayagarh	9	942	103	339	37 (44%)	51%	320	169	20%	68	17%	54	7%	79%	76%	77%
Nuapada	6	965	171	332	59 (69%)	42%	452	51	6%	63	15%	14	2%	57%	49%	76%
Puri	16	1244	78	422	27 (31%)	62%	262	307	31%	131	24%	86	9%	89%	69%	89%
Rayagada	9	1311	150	799	92 (108%)	76%	258	124	10%	102	11%	7	1%	88%	82%	87%
Sambalpur	10	1290	131	498	51 (59%)	57%	379	284	24%	76	13%	104	9%	87%	84%	88%
Sonapur	6	571	100	239	42 (49%)	56%	185	89	17%	26	10%	17	3%	83%	63%	86%

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Sundargarh	19	2968	153	1282	66	(78%)	883	529	20%	169	12%	88	3%	78%	85%
<b>Pondicherry</b>	10	1462	139	614	59	(78%)	291	274	23%	253	29%	20	2%	69%	75%
<b>Punjab</b>															
Amritsar	33	4046	122	1625	49	(52%)	815	979	29%	542	25%	156	5%	80%	86%
Bathinda	13	1475	116	545	43	(45%)	348	257	22%	261	32%	65	6%	93%	85%
Faridkot	6	852	143	363	61	(64%)	160	149	22%	135	27%	31	5%	89%	70%
Fatehgarh Sahib	6	525	90	209	36	(38%)	85	126	30%	86	29%	31	7%	78%	81%
Firozpur	19	1927	103	830	44	(47%)	449	212	14%	358	30%	52	3%	85%	
Gurdaspur	23	2336	104	1038	46	(48%)	596	252	13%	386	27%	64	3%	89%	82%
Hoshiarpur	16	1608	101	719	45	(48%)	360	212	16%	285	28%	50	4%	86%	82%
Jalandhar	21	1964	94	779	37	(39%)	384	375	24%	375	32%	49	3%	84%	71%
Kapurthala	8	666	82	348	43	(45%)	99	107	19%	107	24%	20	4%	84%	100%
Ludhiana	33	4817	148	1508	46	(49%)	1799	966	23%	367	20%	240	6%	93%	86%
Mansa-PU	7	952	129	321	43	(46%)	292	134	18%	133	29%	29	4%	88%	83%
Moga	10	970	102	402	42	(44%)	240	136	17%	137	25%	29	4%	87%	82%
Muktsar	8	970	116	452	54	(57%)	190	98	13%	199	30%	35	5%	82%	73%
Nawanshahr	6	698	111	293	46	(49%)	191	99	17%	94	24%	32	5%	87%	91%
Patiala	20	2945	149	1004	51	(53%)	632	778	32%	403	29%	167	7%	91%	85%
Rupnagar	12	1390	117	566	47	(50%)	250	302	27%	224	28%	54	5%	91%	88%
Sangrur	21	2623	122	942	44	(46%)	825	336	16%	328	26%	90	4%	89%	88%
<b>Rajasthan</b>															
Ajmer	24	5170	215	1665	69	(86%)	1572	690	18%	1087	39%	134	3%	92%	88%
Alwar	33	4575	138	1614	49	(61%)	1616	479	13%	769	32%	116	3%	89%	89%
Banswara	17	3018	182	1337	81	(101%)	843	206	9%	613	31%	82	3%	92%	90%
Baran	11	2535	224	1081	96	(120%)	677	291	14%	411	28%	129	6%	91%	88%
Barmer	22	3060	141	1066	49	(61%)	1370	135	5%	429	29%	41	2%	92%	90%
Bharatpur	23	3022	130	1035	45	(56%)	1216	169	7%	543	34%	81	3%	88%	86%
Bhilwara	22	4897	221	1808	81	(102%)	1114	718	20%	1091	38%	200	5%	93%	92%
Bikaner	21	2875	137	1012	48	(60%)	721	500	22%	518	34%	164	7%	91%	90%

(Contd.)

## Annual Performance of Districts (Contd...)

District	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	Population covered by RNTCP <sup>a</sup> (in lakh)	Total patients registered for treatment <sup>y</sup>	Annual total case detection rate per lakh	New smear positive patients registered for treatment	Annual new smear positive case detection rate per lakh (%)	% new sputum positive out of total new pulmonary cases	No. of new smear negative cases registered for treatment	No. of new EP cases registered for treatment	% of new EP cases out of all new cases	No. of smear positive retreatment cases registered for treatment	% of retreatment cases out of all smear positive cases	No. (%) of paediatric cases out of all new cases	3 month conversion rate of new smear positive patients <sup>o</sup>	Cure rate of new smear positive patients <sup>e</sup>	Success rate of new smear positive patients <sup>e</sup>
Bundi	11	1931	182	683	64 (80%)	49%	718	126	8%	284	29%	51	91%	79%	83%
Chittaurgarh	20	3052	153	1300	65 (82%)	68%	612	436	19%	670	34%	69	92%	80%	89%
Churu	19	3195	170	1196	64 (80%)	58%	852	457	18%	603	33%	208	93%	88%	88%
Dausa	15	2373	163	876	60 (75%)	57%	669	308	17%	453	34%	100	89%	84%	87%
Dhaulpur	11	1849	170	730	67 (84%)	62%	452	166	12%	440	37%	91	90%	85%	86%
Dungarpur	12	2680	219	1370	112 (140%)	66%	704	102	5%	485	26%	41	91%	89%	91%
Ganganagar	20	3123	158	1135	57 (72%)	52%	1051	418	16%	469	29%	111	91%	91%	93%
Hanumangarh	17	3003	179	1182	70 (88%)	64%	663	418	18%	655	36%	115	91%	86%	88%
Jaipur	58	11287	194	3391	58 (73%)	50%	3355	2022	23%	1888	35%	639	91%	88%	88%
Jaisalmer	6	656	117	257	46 (57%)	58%	185	99	18%	106	29%	24	90%	88%	93%
Jalore	16	1826	114	518	32 (40%)	39%	818	45	3%	357	41%	37	91%	83%	83%
Jhalawar	13	2021	155	787	60 (75%)	54%	683	141	9%	378	32%	37	91%	84%	85%
Jhunjhunun	21	2608	123	885	42 (52%)	53%	789	247	13%	552	37%	57	88%	83%	84%
Jodhpur	32	3413	107	1196	38 (47%)	48%	1311	294	10%	549	31%	41	87%	81%	84%
Karauli	13	2608	196	1005	75 (94%)	56%	802	175	9%	590	37%	141	93%	86%	89%
Kota	17	3026	175	1130	65 (81%)	54%	944	400	16%	500	31%	205	95%	91%	95%
Nagaur	31	3637	119	1286	42 (52%)	49%	1320	270	9%	680	34%	76	91%	86%	89%
Pali	20	3407	169	1138	57 (71%)	44%	1437	257	9%	532	32%	152	91%	87%	91%
Rajsamand	11	1588	146	698	64 (80%)	61%	437	203	15%	247	26%	33	87%	80%	83%
Sawai Madhopur	12	2324	188	853	69 (86%)	58%	616	303	17%	505	37%	98	91%	86%	89%

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Sikar	25	3789	150	1260	50	(62%)	1203	431	15%	612	32%	151	5%	93%	88%
Sirohi	9	1486	158	563	60	(75%)	525	84	7%	294	34%	19	2%	89%	84%
Tonk	13	3537	264	1473	110	(138%)	1003	257	9%	712	32%	55	2%	91%	89%
Udaipur	29	6744	232	2824	97	(121%)	1438	978	19%	1335	32%	374	7%	86%	88%
<b>Sikkim</b>															
East	3	822	300	256	93	(124%)	156	221	35%	127	33%	118	19%	86%	87%
North	0	129	281	35	76	(102%)	41	32	30%	11	23%	18	17%	97%	83%
South	1	386	262	137	93	(124%)	74	88	29%	49	26%	36	12%	89%	92%
West	1	241	175	93	67	(90%)	39	56	30%	38	29%	20	11%	91%	89%
<b>Tamil Nadu</b>															
Chennai	44	7368	167	2860	65	(87%)	1723	1822	28%	746	21%	174	3%	93%	89%
Coimbatore	44	5136	117	2358	54	(71%)	1186	986	22%	498	17%	304	7%	88%	85%
Cuddalore	24	3618	152	1305	55	(73%)	1282	523	17%	249	15%	100	3%	93%	90%
Dharmapuri	30	3453	117	1421	48	(64%)	925	777	25%	286	17%	252	8%	92%	87%
Dindigul	20	3624	181	1479	74	(98%)	1148	769	23%	201	12%	545	16%	90%	87%
Erode	27	3106	116	1503	56	(75%)	852	415	15%	250	14%	120	4%	89%	85%
Kancheepuram	30	4873	163	1995	67	(89%)	1026	1016	25%	470	19%	158	4%	93%	90%
Kanniyakumari	17	2239	129	909	52	(70%)	845	309	15%	149	14%	477	23%	93%	92%
Karur	10	1317	135	571	59	(78%)	405	181	16%	138	19%	66	6%	87%	87%
Madurai	27	4494	168	1572	59	(78%)	1544	782	20%	305	15%	500	13%	90%	89%
Nagapattinam	16	1818	117	750	48	(64%)	687	186	11%	165	18%	261	16%	92%	88%
Namakkal	16	2099	135	839	54	(72%)	523	549	29%	181	18%	303	22%	90%	87%
Perambalur	12	1577	128	654	53	(71%)	503	307	21%	103	13%	222	15%	90%	88%
Pudukottai	15	1770	117	753	50	(66%)	543	291	18%	150	16%	175	11%	86%	86%
Ramanathapuram	12	2013	163	845	68	(91%)	728	269	15%	164	16%	416	23%	90%	89%
Salem	31	3965	127	1667	53	(71%)	1031	862	24%	379	18%	437	12%	90%	87%
Sivaganga	12	1674	139	697	58	(77%)	580	214	14%	135	16%	160	11%	91%	88%
Thanjavur	23	3040	132	1239	54	(72%)	889	568	21%	252	16%	413	15%	94%	90%
The Nilgiris	8	518	65	163	20	(27%)	157	154	32%	30	15%	89	19%	84%	84%
Theni	11	2454	215	624	55	(73%)	1377	210	9%	131	17%	649	29%	83%	84%

(Contd.)

## Annual Performance of Districts (Contd...)

District	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
		Population covered by RNTCP <sup>a</sup> (in lakh)	Total patients registered for treatment <sup>y</sup>	Annual total case detection rate per lakh	New smear positive patients registered for treatment	Annual new smear positive case detection rate per lakh (%)	% new sputum positive out of total new pulmonary cases	No. of new smear negative cases registered for treatment	No. of new EP cases registered for treatment	% of new EP cases out of all new cases	No. of smear positive retreatment cases registered for treatment	% of retreatment cases out of all smear positive cases	No. (%) of paediatric cases out of all new cases	3 month conversion rate of new smear positive patients <sup>o</sup>	Cure rate of new smear positive patients <sup>e</sup>	Success rate of new smear positive patients <sup>e</sup>
Thiruvallur		29	4121	144	1698	59 (79%)	62%	1062	843	23%	407	19%	91	92%	90%	91%
Thiruvannamalai		12	1436	118	640	53 (70%)	60%	430	207	16%	120	16%	27	89%	87%	88%
Tiruchirappalli		25	3279	132	1315	53 (70%)	56%	1018	705	23%	208	13%	217	90%	87%	88%
Tirunelveli		29	4761	163	1504	51 (69%)	41%	2168	688	16%	340	18%	598	89%	85%	88%
Tiruvannamalai		23	3071	135	1555	68 (91%)	70%	679	600	21%	230	13%	342	90%	86%	86%
Toothukudi		16	2384	146	1043	64 (85%)	56%	817	314	14%	200	16%	218	90%	87%	87%
Vellore		36	5226	144	2304	63 (85%)	58%	1674	787	17%	417	15%	187	94%	89%	89%
Viluppuram		31	4676	152	1826	59 (79%)	56%	1420	706	18%	480	21%	424	92%	90%	90%
Virudhunagar		18	3615	198	1165	64 (85%)	49%	1234	928	28%	218	15%	596	92%	86%	86%
<b>Tripura</b>																
Dhalai		3	45		25		81%	6	3	9%	9	26%	0			
North Tripura		6	57		19		51%	18	4	10%	8	30%	0			
South Tripura		8	276	34	174	22 (29%)	64%	97	43	14%	51	23%	7	86%	85%	88%
West Tripura		16	1051	65	556	34 (46%)	71%	224	130	14%	122	18%	22	86%	83%	89%
<b>Uttar Pradesh</b>																
Agra		40	4423	112	1331	34 (35%)	52%	1210	559	18%	1099	44%	287	91%	79%	81%
Aligarh		33	3361	103	1446	44 (46%)	57%	1090	417	14%	369	20%	227	92%	85%	86%
Allahabad		54	5478	101	2238	41 (43%)	55%	1853	434	10%	768	26%	221	91%	78%	87%
Ambekar Nagar		22	236		47		27%	124	19	10%	28	37%	3			
Auraiya		13	276	99	119		52%	111	4	2%	42	26%	2			
Azamgarh		43	2148	99	1128	39 (41%)	62%	705	108	6%	178	14%	66	84%		

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)		
Baghpat	13	1633	128	715	56	(59%)	63%	414	230	17%	265	27%	82	6%	91%	88%	89%
Bahraich	29	4486	153	2024	69	(73%)	60%	1364	592	15%	504	20%	191	5%	91%	88%	89%
Ballia	30	1331	88	341	14	(14%)	30%	779	90	7%	106	24%	42	3%	87%		
Balrampur	18	1077	117	421	30	(31%)	46%	485	43	5%	98	19%	30	3%	85%		
Banda	16	905	73	321	26	(27%)	52%	302	120	16%	161	33%	70	9%	77%		
Barabanki	33	3989	119	1965	59	(62%)	64%	1086	386	11%	552	22%	181	5%	92%	87%	88%
Barilly	39	7529	191	2820	71	(75%)	51%	2681	588	10%	1139	29%	240	4%	90%	83%	85%
Basti	23	2603	115	860	38	(40%)	43%	1139	357	15%	241	22%	155	7%	90%	78%	79%
Bijnor	34	2972	87	1074	31	(33%)	52%	979	390	16%	507	32%	212	9%	91%	85%	86%
Budaun	34	4339	129	2114	63	(66%)	58%	1526	160	4%	474	18%	178	5%	93%	83%	90%
Bulandshahar	32	4053	126	1479	46	(49%)	48%	1627	417	12%	482	25%	199	6%	93%	88%	89%
Chandauli	18	36		12			60%	8	0	0%	12	50%	0	0%			
Chitrakoot	9	3		3			100%	0	0	0%	0	0%	0	0%			
Deoria	30	717	96	206	16	(17%)	37%	354	53	9%	77	27%	25	4%	87%		
Etah	31	2994	98	1177	39	(41%)	59%	813	360	15%	522	30%	228	10%	91%	84%	85%
Etawah	15	1929	131	812	55	(58%)	50%	799	126	7%	167	17%	71	4%	90%	82%	83%
Faizabad	19	1904	101	811	43	(45%)	56%	628	227	14%	226	22%	105	6%	90%	81%	82%
Farrukhabad	17	2451	142	1077	62	(66%)	59%	763	280	13%	328	23%	136	6%	91%	75%	76%
Fatehpur	25	2266	90	864	34	(36%)	53%	780	188	10%	407	32%	72	4%	88%	81%	90%
Firozabad	22	335	60	99	17	(18%)	83%	21	35	23%	162	61%	21	14%	100%		
Gautam Budh Nagar	13	2547	195	921	71	(74%)	55%	765	478	22%	310	25%	110	5%	92%	86%	86%
Ghaziabad	36	8753	243	3630	101	(106%)	61%	2281	1591	21%	1014	22%	615	8%	92%	89%	89%
Ghaziipur	33	1058	63	455	22	(23%)	52%	428	40	4%	95	17%	38	4%	87%		
Gonda	30	3137	138	1046	38	(41%)	38%	1708	43	2%	338	24%	69	2%	75%		
Gorakhpur	41	675	33	246	10	(10%)	43%	329	50	8%	44	15%	30	5%	80%		
Hamirpur-UP	11	1487	130	492	43	(45%)	72%	195	31	4%	48	26%	29	8%	91%	79%	86%
Hardoi	37	4284	115	1867	50	(53%)	59%	1308	205	6%	820	30%	130	4%	86%	80%	80%
Hathras	15	572	157	260	36	(37%)	76%	81	20	6%	195	43%	10	3%	82%		
Jalaun	16	1636	137	848	69	(73%)	68%	396	48	4%	308	26%	297	23%	92%		
Jaunpur	43	4499	105	1567	37	(38%)	43%	2045	328	8%	474	23%	113	3%	88%	79%	84%
Jhansi	19	2115	110	1046	55	(58%)	65%	570	153	9%	287	21%	84	5%	90%	80%	80%

(Contd.)

## Annual Performance of Districts (Contd...)

District	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
		Population covered by RNTCP <sup>a</sup> (in lakh)	Total patients registered for treatment <sup>y</sup>	Annual total case detection rate per lakh	New smear positive patients registered for treatment	Annual new smear positive case detection rate per lakh (%)	% new sputum positive out of total new pulmonary cases	No. of new smear negative cases registered for treatment	No. of new EP cases registered for treatment	% of new EP cases out of all new cases	No. of smear positive retreatment cases registered for treatment	% of retreatment cases out of all smear positive cases	No. (%) of paediatric cases out of all new cases	3 month conversion rate of new smear positive patients <sup>d</sup>	Cure rate of new smear positive patients <sup>e</sup>	Success rate of new smear positive patients <sup>e</sup>
Jyotiba Phule Nagar	16	924	225	30	279	(32%)	42%	390	25	4%	148	35%	26	78%		
Kannauj	15	1014	89	35	405	(37%)	87%	62	13	3%	47	31%	5	81%		
Kanpur Dehat	17	714	164	36	270	(38%)	47%	308	35	6%	92	25%	6	88%		
Kanpur Nagar	45	4707	104	46	2065	(48%)	63%	1208	560	15%	798	28%	245	87%	66%	81%
Kaushambi	14	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Kheri	35	3956	113	43	1514	(45%)	48%	1614	204	6%	616	29%	178	87%	81%	82%
Kushinagar	32	1444	61	28	685	(30%)	54%	578	51	4%	114	14%	49	87%		
Lalitpur	11	749	93	42	346	(44%)	70%	151	33	6%	151	29%	19	82%		
Lucknow	40	6372	158	66	2645	(69%)	61%	1718	953	18%	902	25%	355	92%	87%	87%
Maharajganj	24	665	37	15	284	(16%)	46%	331	30	5%	20	7%	18	94%		
Mahoba	8	457	78	35	253	(37%)	85%	45	17	5%	130	34%	15	81%		
Mainpuri	17	2151	123	60	1039	(63%)	55%	836	49	3%	226	18%	80	94%	87%	89%
Mathura	23	2423	107	42	956	(44%)	49%	996	211	10%	230	19%	86	93%	88%	88%
Mau	20	915	181	16	281	(16%)	35%	513	46	5%	68	19%	48	82%		
Meerut	33	5520	168	72	2382	(76%)	56%	1854	682	14%	467	16%	197	93%	91%	93%
Mirzapur	23	1811	78	37	850	(39%)	56%	668	71	4%	219	20%	70	83%	79%	82%
Moradabad	41	5071	123	45	1835	(47%)	42%	2551	337	7%	315	15%	181	90%	80%	83%
Muzaffarnagar	39	4892	126	54	2103	(57%)	59%	1486	493	12%	736	26%	183	86%	79%	86%
Pilibhit	18	1614	119	52	737	(55%)	70%	309	78	7%	419	36%	65	88%		
Pratapgarh	30	2244	75	25	749	(26%)	43%	1011	194	10%	283	27%	114	69%	65%	76%
Rae Bareli	31	4022	128	53	1676	(56%)	48%	1821	197	5%	325	16%	127	85%	77%	88%



(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	
Rampur	21	3290	156	1395	66	(70%)	62%	873	308	12%	691	33%	119	5%	91%	84%
Saharanpur	31	4832	155	2065	66	(70%)	65%	1093	592	16%	1004	33%	275	7%	92%	86%
Sant Kabir Nagar	16	4		3			75%	1	0	0%	0	0%	0	0%		
Sant Ravidas Nagar	15	796	107	264	29	(30%)	43%	356	41	6%	78	23%	15	2%	97%	
Shahjahanpur	28	2711	97	990	35	(37%)	46%	1181	221	9%	247	20%	91	4%	87%	83%
Shravasti	10	3		1			100%	0	0	0%	0	0%	0	0%		
Siddharthnagar	22	1085	65	477	28	(30%)	53%	420	43	5%	140	23%	20	2%	91%	
Sitapur	40	5822	147	2281	58	(61%)	50%	2296	315	6%	761	25%	199	4%	90%	86%
Sonbhadra	16	498	62	236	21	(22%)	62%	146	29	7%	81	25%	12	3%	88%	
Sultanpur	35	2382	68	1291	37	(39%)	63%	745	133	6%	203	14%	86	4%	93%	86%
Unnao	30	4506	152	1381	47	(49%)	37%	2395	270	7%	448	24%	147	4%	94%	92%
Varanasi	35	4191	121	1583	46	(48%)	51%	1509	570	16%	460	22%	281	8%	92%	88%
<b>Uttaranchal</b>																
Almora	7	548	81	246	36	(38%)	75%	82	106	24%	109	30%	2	0%	97%	91%
Bageshwar	3	170	64	73	27	(29%)	65%	39	13	10%	45	38%	0	0%	94%	88%
Chamoli	4	565	143	224	57	(60%)	54%	191	60	13%	77	25%	20	4%	85%	85%
Champawat	2	245	102	110	46	(48%)	61%	71	8	4%	54	33%	1	1%	93%	89%
Dehradun	14	2416	176	834	61	(64%)	50%	848	332	16%	323	28%	223	11%	96%	92%
Garhwal	7	785	105	378	51	(53%)	58%	269	79	11%	48	11%	15	2%	94%	82%
Hardwar	15	1393	90	637	41	(43%)	66%	325	74	7%	334	34%	31	3%	89%	80%
Nainital	8	1350	165	571	70	(73%)	71%	232	233	22%	301	35%	34	3%	88%	83%
Pithoragarh	5	485	98	229	46	(49%)	66%	117	47	12%	92	29%	7	2%	95%	94%
Rudrapur	2	254	104	114	47	(49%)	67%	56	23	12%	59	34%	6	3%	90%	77%
Tehri Garhwal	6	556	86	223	34	(36%)	57%	165	51	12%	112	33%	8	2%	97%	93%
Udhamsingh Nagar	13	1526	115	616	47	(49%)	58%	455	125	10%	284	32%	31	3%	92%	85%
Uttarkashi	3	532	169	174	55	(58%)	54%	146	91	22%	107	38%	28	7%	95%	85%
<b>West Bengal</b>																
Bankura	34	4341	127	2194	64	(86%)	68%	1045	517	14%	422	16%	131	3%	93%	89%
Bardhaman	74	9965	135	4136	56	(75%)	56%	3293	725	9%	970	19%	434	5%	90%	87%
Birbhum	32	4098	127	2228	69	(92%)	70%	956	303	9%	446	17%	71	2%	90%	87%
Dakshin Dinajpur	16	2516	157	1373	86	(114%)	73%	500	281	13%	247	15%	77	4%	90%	84%

(Contd.)

## Annual Performance of Districts (Contd...)

District	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	Popu- lation (in lakh)	Total patients registered for treat- ment <sup>γ</sup>	Annual total case de- tection rate per lakh	New smear positive patients regis- tered for treat- ment	Annual new smear positive case detection rate per lakh (%)	% new sputum positive out of total new pul- monary cases	No. of new smear negative cases regis- tered for treat- ment	No. of new EP cases regis- tered for treat- ment	% of new EP cases out of all new cases	No. of new paediatric cases out of all new cases	% of retreat- ment cases out of all smear positive cases	No. (%) of paediatric cases out of all new cases	3 month conver- sion rate of new smear positive pati- ents <sup>δ</sup>	Cure rate of new smear positive pati- ents <sup>ε</sup>	Success rate of new smear positive patients <sup>ε</sup>
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Darjiling	17	3195	186	1069	62 (83%)	58%	769	670	27%	340	23%	208	82%	67%	76%
Haora	46	6193	136	2190	48 (64%)	57%	1667	983	20%	729	25%	469	89%	84%	85%
Hugli	54	6996	130	2958	55 (73%)	60%	1979	918	16%	608	17%	249	91%	88%	90%
Jalpaiguri	36	6226	171	3112	86 (114%)	76%	1004	952	19%	797	20%	412	90%	87%	87%
Koch Bihar	26	3059	116	1489	56 (75%)	66%	760	452	17%	219	13%	63	91%	87%	88%
Kolkata	49	6749	138	2845	58 (78%)	74%	1023	1411	27%	1090	27%	482	86%	86%	86%
Maldah	35	5496	156	2577	73 (98%)	62%	1608	518	11%	539	17%	321	86%	81%	81%
Medinipur East	47	3373	71	1833	39 (52%)	78%	524	412	15%	346	16%	106	87%	82%	83%
Medinipur West	56	7007	126	2967	53 (71%)	59%	2043	744	13%	592	16%	162	90%	85%	87%
Murshidabad	63	7065	113	3376	54 (72%)	66%	1731	1010	17%	634	16%	368	92%	88%	89%
Nadia	49	5918	120	2406	49 (65%)	56%	1910	629	13%	469	16%	198	91%	89%	89%
North 24 Parganas	95	10560	111	4995	52 (70%)	72%	1923	1626	19%	1116	18%	474	91%	90%	90%
Puruliya	27	4239	157	1893	70 (93%)	57%	1435	280	8%	289	13%	74	91%	86%	88%
South 24 Parganas	74	7401	100	3715	50 (67%)	69%	1664	920	15%	707	16%	353	91%	88%	90%
Uttar Dinajpur	26	3344	128	1420	54 (73%)	57%	1062	310	11%	258	15%	122	90%	86%	88%
<b>Grand Total</b>	<b>10800</b>	<b>1293083</b>	<b>128</b>	<b>506193</b>	<b>50</b> <b>(66%)</b>	<b>56%</b>	<b>391255</b>	<b>170338</b>	<b>16%</b>	<b>164377</b>	<b>24%</b>	<b>59846</b>	<b>89%</b>	<b>84%</b>	<b>86%</b>

Values for grey areas are not expected

Estimated New Smear Positive cases / lakh population based on ARTI data for North Zone (Chandigarh, Delhi, Haryana, Himachal Pradesh, Jammu & Kashmir, Punjab, Uttar Pradesh, Uttaranchal) is 95; East Zone (Andaman & Nicobar, Arunachal Pradesh, Assam, Bihar, Jharkhand, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura, West Bengal) is 75; South Zone (Andhra Pradesh, Karnataka, Kerala, Lakshadweep, Pondicherry, Tamil Nadu) is 75 and West Zone (Chhattisgarh, Dadra & Nagar Haveli, Daman & Diu, Goa, Gujarat, Madhya Pradesh, Maharashtra, Rajasthan) is 80; Orissa is 85

α Projected population based on census population of 2001 is used for calculation of case-detection rate. 1 lakh = 100,000 population

γ Total patients registered for treatment includes new sputum smear positive cases, new smear negative cases, new extra-pulmonary cases, smear positive retreatment cases and 'Others'

δ Smear conversion rate not expected for districts that began implementing RNTCP during 4th quarter 2005

ε Cure rate and success rate are not expected for districts that began implementing RNTCP after 4th quarter 2004

**Referral of TB Suspects from VCTC to RNTCP diagnostic units, 3rd and 4th quarter 2005  
(Reported by Phase-I States Implementing Joint TB-HIV Action Plan)**

	Andhra Pradesh		Karnataka		Maharashtra		Manipur		Nagaland		Tamil Nadu		Total	
	HIV Positive	HIV Negative	HIV Positive	HIV Negative	HIV Positive	HIV Negative	HIV Positive	HIV Negative	HIV Positive	HIV Negative	HIV Positive	HIV Negative	HIV Positive	HIV Negative
Total Population (In lakhs)	798		562		1050		27		24		648		3108	
Total No. of districts*	24		28		48		9		8		29		146	
1. Number of TB suspects referred from VCTCs to RNTCP facilities**	2176	1752	787	1012	1231	1128	48	14	6	5	1807	1365	6055	5276
2. Out of the above persons, number diagnosed as having TB:														
a) Sputum Positive TB	293	351	141	221	147	175	4	1	1	2	151	154	737	904
b) Sputum Negative TB	356	116	99	154	83	63	13	0	3	4	118	107	672	444
c) Extra-Pulmonary TB	33	20	68	25	37	23	3	0	0	0	51	17	192	85
d) Total diagnosed TB patients	682	487	308	400	267	261	20	1	4	6	320	278	1601	1433
3. Out of above total diagnosed TB patients (d), number receiving DOTS	325	363	217	278	208	209	16	0	2	1	226	202	994	1053

\* 125 districts in 3rd quarter 2005 and 129 districts in 4th quarter 2005 reported on TB-HIV activities

\*\* Includes TB suspects referred during 2nd quarter and 3rd quarter 2005





# *Towards Freedom from TB....*



Sputum smear microscopy is the most reliable diagnostic tool for pulmonary TB.



TB is curable...  
adopt DOTS



Drugs are provided for the entire duration of treatment.



Treatment success rate is up to 95 percent under DOTS

