

TB India 2007

RNTCP Status Report

**TB
ANYWHERE
is
TB
EVERYWHERE**

Stop TB Now



सत्यमेव जयते

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



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डॉ अन्बुमणी रामदास
Dr. Anbumani Ramadoss

FOREWORD

I am extremely pleased to know that the Revised National TB Control Programme (RNTCP) has achieved 100% geographical coverage of the country under DOTS in March 2006 and has also consistently achieved the global target of treatment success rate of over 85% and that the case detection rate has been close to the global target of 70%. RNTCP has been recognised internationally for the fastest expansion in the history of DOTS implementation.

I am happy that the achievements of RNTCP have been lauded on the international stage forum.

India has the distinction of implementing the largest TB control programme in the world, which detects and put on DOTS more than 100,000 patients every month. Since the inception of the programme, about 6.7 million patients have been initiated on treatment, thereby saving more than 1.2 million additional lives. In 2004, 22% of the new infectious cases notified globally were from India.

In October 2006, the Government of India invited a panel of international experts from the fields of public health, TB research and treatment, and other related fields to review the performance of the programme. This is the third such Joint Monitoring Mission (JMM) to review the RNTCP. The mission observed that "Programme service delivery is well integrated into the health system; tuberculosis care is provided by general health staff. The programme organisation has been established at all levels. External quality assessment has been implemented in the microscopy network. There is an excellent system of recording and reporting, with indicators for monitoring and evaluation..." The Mission was impressed with the Government of India's efforts and has made several recommendations to further improve the programme, such as strengthening human resources at the central unit, promote effective service delivery and integration with NRHM, including prioritising the starting of management of MDR-TB at the earliest. RNTCP is currently taking steps to address these recommendations.

Combating TB is a long-term but a winnable battle. This year's theme for World TB Day that "TB anywhere is TB everywhere" also points towards directing effort towards a TB-free India. Let us pledge to continue our efforts to fight against tuberculosis. We need to strengthen the core capacity of all those involved in programme implementation. There is also an urgent need to improve standardised treatment practices based on international guidelines for TB treatment both in the public sector and more so in the private sector. This can be achieved by linking all such health care providers to RNTCP and proactively building a working relationship with the other sectors. The programme has also put mechanisms in place to make services accessible, acceptable and affordable through partnership with the community based organisations and greater community participation and empowerment.

This is the seventh annual report of RNTCP being published, at a juncture when the programme has made considerable achievements, established TB/HIV collaborative activities for cross referral linkages between the two programmes, and identified thrust areas in the second phase of RNTCP, backed by the critical observations of the JMM to improve programme effectiveness. Concerted efforts are needed from the Government and all partners to sustain the achievements and effectively implement the additional planned activities.

Myself and my Ministry are fully committed to continue and intensify the efforts to combat TB in India. I hope that all individuals and agencies involved in TB control in India will continue to work with high levels of dedication and commitment to achieve the ultimate goal of a TB-free India.

(Dr. Anbumani Ramadoss)

March 2, 2007

Abbreviations

ACSM	Advocacy, Communication and Social Mobilisation
ADGHS	Assistant Director General of Health Services
AIDS	Acquired Immune Deficiency Syndrome
AIIMS	All India Institute of Medical Sciences
ARTI	Annual Risk of Tuberculosis Infection
ASHA	Accredited Social Health Activist
BCG	Bacillus Calmette-Guerin (antituberculosis vaccine)
BPHC	Block Primary Health Centre
C&S	Care and Support
CDC	Centres for Disease Control and Prevention
CGHS	Central Government Health Scheme
CHAI	Christian Health Association of India
CHC	Community Health Centre
CII	Confederation of Indian Industries
CMAI	Christian Medical Association of India
CSC	Central Steering Committee
CTD	Central Tuberculosis Division
DANIDA	Danish International Development Assistance
DDG	Deputy Director General
DFID	Department for International Development
DGHS	Directorate General of Health Services
DMC	Designated Microscopy Centre
DOTS	Directly Observed Treatment Short-course
DRS	Drug Resistance Surveillance
DST	Drug Sensitivity Testing
DTC	District Tuberculosis Centre

DTCS	District TB Control Society
DTO	District Tuberculosis Officer
E	Ethambutol
EQA	External Quality Assessment
GMSD	Government Medical Stores Depot
GoI	Government of India
H	Isoniazid
HIV	Human Immunodeficiency Virus
HRD	Human Resource Development
ICMR	Indian Council of Medical Research
IEC	Information, Education and Communication
IMA	Indian Medical Association
IRL	Intermediate Reference Laboratories
ISM&H	Indigenous System of Medicine and Homeopathy
IUATLD	International Union Against Tuberculosis and Lung Disease
JMM	Joint Monitoring Mission
KAP	Knowledge, Attitude and Practices
LT	Laboratory Technician
MDG	Millennium Development Goals
MDR-TB	Multi Drug-resistant TB (resistance to at least rifampicin and isoniazid)
MIS	Management Information System
MO	Medical Officer
MoHFW	Ministry of Health and Family Welfare
MOTC	Medical Officer-Tuberculosis Control
MoU	Memorandum of Understanding
NACO	National AIDS Control Organisation
NACP	National AIDS Control Programme
NGO	Non Governmental Organisation
NRHM	National Rural Health Mission
NRL	National Reference Laboratories
NTF	National Task Force
NTI	National Tuberculosis Institute
NTP	National Tuberculosis Programme
OR	Operational Research
OSE	On-site Evaluation

PHC	Primary Health Centre
PL	Peripheral Laboratory
PP	Private Practitioner
PPM	Public-Private Mix
PSU	Public Sector Units
PTB	Pulmonary Tuberculosis
PWB	Patient-wise Boxes
QA	Quality Assurance
R	Rifampicin
RBRC	Random Blinded Re-Checking
RNTCP	Revised National Tuberculosis Control Programme
SDS	State Drug Stores
SMC	Screening and Monitoring Committee
STC	State TB Cell
STDC	State Tuberculosis Training & Demonstration Centre
STF	State Task Force
STLS	Senior Tuberculosis Laboratory Supervisor
STO	State Tuberculosis Officer
STS	Senior Treatment Supervisor
TB	Tuberculosis
TPIS	Tuberculosis Programme Information System
TRC	Tuberculosis Research Centre
TU	Tuberculosis Unit
USAID	United States Agency for International Development
VCTC	Voluntary Testing and Counselling Centres
WHO	World Health Organization
Z	Pyrazinamide
ZTF	Zonal Task Force

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RNTCP OVERVIEW 2006

India is a large country with a vast and divergent public sector complemented by an equally large private sector. There are states with good socio-demographic and health indicators on the one hand, as well as states with poor economic conditions on the other. Delivering equitable health care in such diverse conditions is a challenge which the government faces in every health programme.

The Revised National Tuberculosis Control Programme (RNTCP) has been implemented in the country for close to a decade now, and more than 6.7 million patients have been put on Directly Observed Treatment – Short Course (DOTS). It has geographically expanded to achieve nation-wide coverage in March 2006, while maintaining a success rate higher than the global target of 85%, and New Smear Positive case detection rate close to the global benchmark of 70%.

RNTCP Achievements till Date

PROGRAMME PERFORMANCE

- Since inception of the programme, nearly 6.7 million patients have been initiated on treatment, with nearly 1.4 million in 2006 alone, resulting in the saving of over 1.2 million additional lives till date.
- To date, more than 500,000 individuals involved in RNTCP activities have been trained.
- The new smear positive pulmonary TB (NSP) case detection rate was 72% in 2004, 66% in 2005 and 66% in 2006, which is close to the global target of 70%.
- Treatment success rate has been maintained consistently over the 85% global target.
- Deaths due to TB have been reduced from over 500,000 annually at the beginning of the programme to currently fewer than 370,000.

PUBLIC PRIVATE MIX

- Over 2,200 Non Governmental Organisations (NGOs), 14,500 private practitioners, and 120 corporate houses are involved in the provision of RNTCP services.
- Presently, 234 medical colleges (including private colleges) are involved in RNTCP and contributing nearly 10–15% of case detection in their respective districts.
- Health facilities in government sectors outside the Health Ministry have been involved, namely Employees State Insurance (ESI), Railways, Ports and the Ministries of Mines, Steel, Coal, etc.
- Collaboration for increased participation of all sectors in RNTCP is being strengthened through constant interaction with all stakeholders, including professional bodies like the Indian Medical Association and the Indian Academy of Paediatricians.

Achievements During 2006

- All government health facilities, sub-centres, and increasing number of community volunteers including anganwadi workers, private practitioners and NGOs, have been involved in the provision of DOTS. Accredited Social Health Activist (ASHA) workers under the National Rural Health Mission (NRHM) are also being trained to participate as DOT providers in rural areas.
- The RNTCP National DOTS-Plus committee for formulating treatment and management guidelines for MDR-TB cases under the RNTCP was constituted in February 2005. The RNTCP DOTS-Plus Guidelines were published in March 2006.
- TB/HIV coordination activities have been strengthened. As of December 2006, cross-referral

mechanisms have been established between health facilities providing RNTCP services and the National AIDS Control Programme (NACP) Voluntary Counselling and Testing Centres in 14 states. Compared to 2005, the cross-referrals reported in 2006 have more than doubled.

- More than 13 lakh VCTC clients were reported to have been provided counselling on TB in the first six months of 2006. As a recent initiative, a “10-point counselling tool on TB” has been developed by RNTCP for use by the counsellors in the VCTCs.
- To build the national Operational Research (OR) capacity and push OR in priority areas, a series of workshops was planned to develop OR proposals with medical colleges. The first such OR workshop was organised by the TB Research Centre in Chennai in September 2006.
- Preliminary findings of the Gujarat Drug Resistance Surveillance (DRS) survey are available. Interim results show that MDR-TB was found in 2.4% of new cases and in 16.9% of re-treatment cases.
- Four national level orientation workshops on revised External Quality Assessment (EQA)

guidelines for implementation of quality improvement processes in the RNTCP Laboratory Network were held in 2006.

- Increasingly the programme is moving toward using electronic submission of reports through the Tuberculosis Programme Information System (TPIS) initiative. In the quarter ending December 2006, almost all of the districts have submitted the quarterly report electronically. The programme is also pilot testing a Windows based version of Epi-Centre, and if successful it is expected to be rolled out across the programme in 2007.
- A training for Master trainers from Gujarat and Maharashtra States on DOTS-Plus was held in January 2007.
- The second national level training of State IEC officers was held in June 2006 to build capacity in planning and implementing ACSM activities.
- A meeting of the national task force and five zonal task force meetings were held to further involve medical colleges in RNTCP activities.
- State specific Annual Risk of TB Infection (ARTI) surveys have been completed in Andhra Pradesh and Kerala.

TB: BURDEN OF THE DISEASE IN INDIA

Chapter 1

"I have no business to live this life if I cannot eradicate this horrible scourge from the mankind,"

Robert Koch, delivering a lecture at Berlin University on his discovery of tuberculosis bacilli, 1882

Robert Koch, while making the above statement would have least expected that even after 125 years, the world would be fighting hard to control TB, an easily curable disease. Despite the courageous efforts of Dr Koch and his successors, TB has not yet been eliminated and is especially prevalent in poor and developing countries.

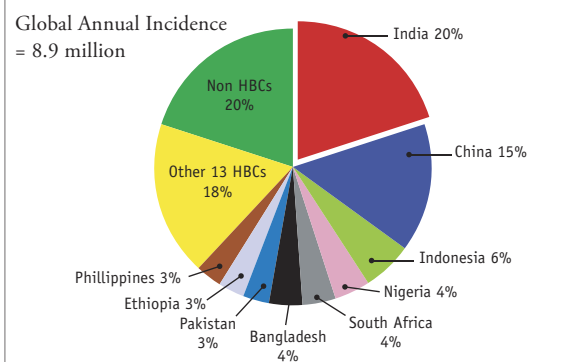
Tuberculosis threatens the health of millions in our country. With 1.8 million cases occurring annually, India accounts for a fifth of the world's new TB cases and 2/3rd of the cases in South-East Asia. This makes India the highest TB burden country in the world. It has been estimated for the year 2000, that there were about 3.8 million bacteriologically positive TB cases in the country.

Magnitude of the Disease

TB remains one of the most serious diseases that affects the health as well as the economy of the country. The bacillus *Mycobacterium tuberculosis* presents itself in various forms – Latent TB infection, Active TB and Multi-drug resistant TB (MDR-TB) disease. The spread of HIV during the last two decades and the emergence of MDR-TB pose additional challenges to effective TB control.

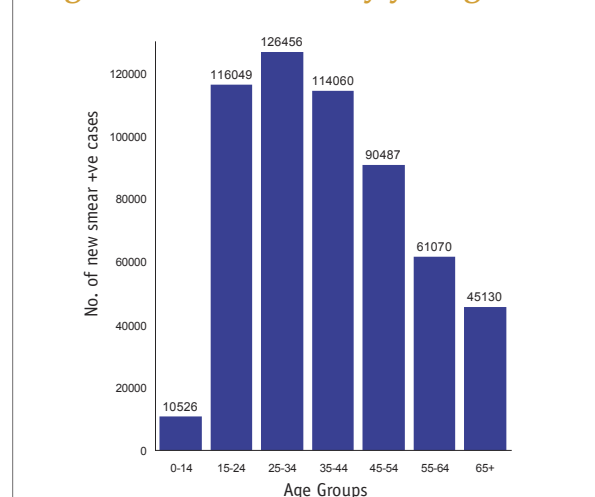
Estimates of TB prevalence, incidence and mortality in the country are based on an analytical and consultative process that takes into account all information available on case notifications, prevalence of infection and disease, tuberculin surveys, duration

Fig. 1: India is the highest TB burden country globally accounting for one-fifth of the global incidence



Source: WHO Geneva; WHO Report 2006: Global Tuberculosis Control; Surveillance, Planning and Financing

Fig. 2: TB affects mostly young adults



Source: RNTCP Data, 2006

STOP TB Strategy for World TB Day¹

World TB Day, March 24th, 2007 will mark the 125th anniversary of Robert Koch's discovery of tuberculosis. This year the theme of the event is "TB anywhere is TB everywhere", reflecting a message of urgency and shared responsibility. Unified action on all levels is required to work towards a world free of tuberculosis. The theme reflects the chronically inadequate investment in TB control, surveillance, research and development as well as TB's deadly synergy with HIV.

The World TB Day theme includes a number of supporting messages which are designed to emphasise the importance of:

1. Improved endemic country financial contributions to TB control
2. Community involvement
3. Scale-up of donor investment
4. Need for decision-makers to protect communities from the threat of multi-drug resistant TB (MDR-TB) and HIV-related TB.

of illness, proportion of smear positive cases, number of cases treated and remaining untreated, HIV prevalence, mortality and demography.

The first estimates of tuberculosis disease prevalence in India became available in the 1950s, and the figure of 4/1000 for the nation as a whole was accepted then. Today, two of every five Indians are infected with the TB bacillus. There is a strong chance that of them, at least 10% will develop TB disease during their lifetime. Of the 1.8 million new TB cases occurring annually, around 0.8 million have sputum

positive pulmonary TB. One sputum positive patient can infect 10–15 persons in a year if left untreated. Poorly treated patients can develop drug-resistant and potentially incurable forms of TB.

Economic Burden

The burden of TB in India is indeed staggering by any measure. TB was declared a "global emergency" by WHO over a decade ago because of its toll on the health of individuals and its wider social and economic impact on overall development of a country.



TB affects the most productive age group (15–54 years)

¹ http://www.stoptb.org/events/world_tb_day/2007/

More than 80% of the burden of tuberculosis is due to premature death, as measured in terms of disability-adjusted life years (DALYs) lost. In India, over 70% of the cases occur in the economically productive age group (15–54 years) and is one of the leading infectious diseases causing death. As per WHO estimates in 2004, 370,000 persons in India died of tuberculosis (mortality rate 30 per 100,000 persons), which was estimated at over 500,000 annually prior to 2000. It is not just the death figures that are startling. TB causes huge economic loss with about 17 crore workdays lost due to the disease. The annual economic cost of tuberculosis to the Indian economy is at least US\$ 3 billion (more than Rs 13,000 crore).

Social Burden – TB and Poverty

The usual victims of TB are migrant labourers, slum dwellers, residents of backward areas and tribal pockets. Known as the disease of the poor, TB often appears where malnutrition, shanty housing and over crowding are common. It can lock the entire community into a circle of disease and poverty.

Women are doubly disadvantaged. They largely ignore medical help in the initial stages, not wanting to neglect household responsibilities. A TB-affected mother can pose a threat to the entire household as she is close to her children and has to perform household duties. In many cases, children whose mothers died of TB were found to be infected. TB deaths among women have major implications for child survival, economic productivity and family welfare. Women try to suppress TB symptoms fearing stigma and rejection. More than 100,000 women with TB are abandoned by their families every year, making it a major deterrent to women's empowerment. More than 300,000 children are forced to leave school every year, because their parents have TB.

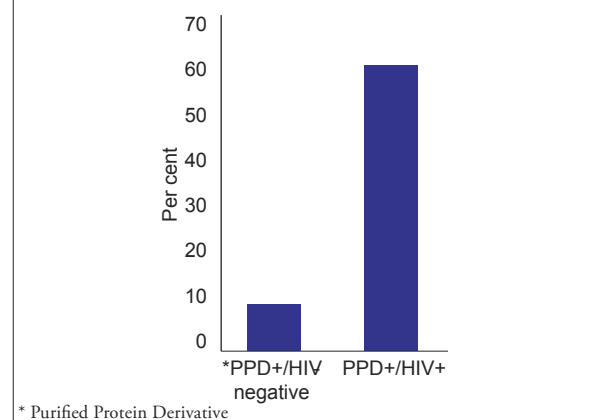
The social stigma of the disease adds to the burden for both men and women. Studies indicate that while men have to deal with the stigma at their workplaces and in the community, women are ostracised in the household and neighbourhood.

Tuberculosis and HIV

The burden of HIV infection in India is estimated to be 5.22 million, which equates to approximately 0.9% of the adult population of the country. Tuberculosis is one of the earliest opportunistic diseases to develop amongst persons infected with HIV. HIV debilitates the immune system, increasing the vulnerability to TB and increasing the risk of progression from TB infection to TB disease. An HIV positive person is six times (50–60% lifetime risk) more likely to develop TB disease once infected with TB bacilli, as compared to an HIV negative person, who has a 10% lifetime risk.

Based on mathematical modeling, WHO has estimated a prevalence of 5.2% of HIV in adult TB patients in India. TB epidemiology in India is however being primarily driven by the TB-infected non-HIV infected pool. Effective implementation of quality DOTS services in the states over the next few years is expected to markedly change the number of new TB cases occurring at any level of HIV prevalence in the country.

Fig. 3: Lifetime Risk of Developing TB Disease



Anti-Tuberculosis Drug Resistance in India

The emergence of strains of *Mycobacterium tuberculosis* that are resistant to antimicrobial agents is a world-wide problem. MDR-TB, defined as resistance to at least isoniazid and rifampicin, is a reflection of poor management of TB cases. It is mainly caused

by failure to ensure that medications are taken, rather than failure of the medicines to cure a large proportion of patients. Drug resistance develops either due to infection with a resistant strain, or as a result of inadequate treatment such as when a patient is exposed to a single drug, or because of selective drug intake, use of inappropriate non-standardised treatment regimens, irregular drug supply, poor drug quality, or rarely erratic absorption of medications.

MDR-TB is posing a potential threat to tuberculosis control in the country. Continuous monitoring of drug resistance trends in high TB prevalent settings is essential in order to assess current interventions and their impact on the TB epidemic. Though drug resistance against isoniazid and rifampicin has been frequently reported in India, the available information is hospital-based, anecdotal, and may not have used quality controlled laboratories for drug susceptibility testing. Presently a series of representative drug resistance surveillance studies is being conducted in selected states in accordance with the WHO global surveillance of drug resistance project. Data from these surveys will provide more valid estimates of the occurrence of MDR-TB and allow for monitoring of the trends in drug resistance levels. Available data from the early surveys show 1–3% MDR-TB among new cases and 13–17% among cases with a previous history of anti-TB treatment.

TB control is a long-term battle and will require extended political support. The targets of case detection and treatment success must first be reached and then maintained for several decades. It has been documented in several countries, that initial success in the control of TB may lead to complacency and a subsequent resurgence of cases and the emergence and spread of drug resistance. The success of the RNTCP in India has been acknowledged worldwide. However, it will take 10–15 years before the success makes a significant epidemiological impact on the problem of TB in the country. Considering the existing caseload, and the continuous addition to this pool of patients, TB control services would be required for at least another 40–50 years in India. Though efforts have been made for decentralisation of the programme, it may not be possible for the states to fund the logistics and technical support required for implementing it at this stage. It is essential that Central assistance to the states for implementation of RNTCP should continue for at least another 5–10 years. Besides, the emergence of TB-HIV co-infection and MDR-TB has increased the severity and magnitude of TB epidemic globally and poses an important challenge to the TB control efforts in India. Unless the national programme, partners and all healthcare providers proactively address these challenges, the goal of TB control may not be realised in this generation's lifetime.



Chapter 2

STOP TB STRATEGY

“WHO has been in the vanguard in strengthening the health sector response. It has led the dramatic scale-up of TB control, and new responses to the huge threats of HIV-associated and drug-resistant TB. It hosts the Stop TB Partnership, which has become a model of consensus-building, innovation and collaboration.”

Former UN Secretary-General Kofi Annan

New WHO Stop TB Strategy

The past decade has seen major progress in global TB control – mainly because of development and widespread implementation of the internationally recommended Directly Observed Treatment, Short-course (DOTS) strategy. DOTS has proved to be an effective tool in controlling TB on a mass basis and is being implemented in over 180 countries.

Building on the current achievements, the major task for the next decade is to achieve the Millennium Development Goals (MDG) and related Stop TB Partnership targets for TB control. Meeting these targets requires a coherent strategy that enables existing achievements to be sustained, effectively addresses the remaining constraints and challenges, and underpins efforts to strengthen health systems, alleviate poverty and advance human rights.

The new WHO Stop TB Strategy, released in 2006 has identified six principal components to realise the global TB-related MDGs by 2015. They are:

- Pursuing high quality DOTS expansion and enhancement;
- Addressing TB/HIV, MDR-TB and other challenges;

- Contributing to health system strengthening;
- Engaging all care providers;
- Empowering patients and communities; and
- Enabling and promoting research.



The RNTCP is an application in India of the internationally recommended DOTS strategy to control TB, with the objective of curing at least 85%

of new sputum positive TB patients and detecting at least 70% of such patients.

Large-scale expansion of DOTS services in India began in 1997 after a successful pilot from 1993, which established the technical and operational feasibility of the strategy. In the past 8 years, RNTCP has been expanding rapidly covering 50% of the population in 2002, and full nation wide coverage was achieved by March 2006.

The essential core element of RNTCP in Phase I was to ensure high quality DOTS expansion in the country, addressing the five primary components of the DOTS strategy.

Political and administrative commitment

The Government of India has accorded the topmost priority to TB control programme. The government's commitment is measured in terms of continued financial commitment, human resources and administrative support. The success of the programme to date bears testimony to the commitment of the government.



Microscopic examination of sputum sample at Nidan Private Designated Microscopy Centre, Orissa

Good quality diagnosis through sputum microscopy

Sputum microscopy continues to be the best tool for detection of infectious TB, 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



Union Health Minister Dr Anbumani Ramadoss along with Ms. P. Lakshmi, Minister of State for Health & Family Welfare, Government of India lending political support to TB Control in India

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

RNTCP uses intermittent short-course chemotherapy regimens, as recommended by the World Health Organization, to reduce the treatment duration and facilitate direct observation (Refer Table 1). The vision of the RNTCP is to have at all times, sufficient quality assured anti-TB drugs available at all the appropriate levels (Peripheral Health Institution/District/State/National) to ensure that no patient has to delay initiation of their treatment, or interrupt treatment, due to the lack of drugs.



Patient-wise boxes

A unique feature of RNTCP are the use of patient-wise drug boxes (for adult and paediatric cases), an innovation of the RNTCP, which contains the entire course of treatment for an individual patient. Patient-Wise drug Boxes (PWBs) have helped to improve patient care, adherence, and drug supply and drug stock management.

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



Advocate, A.I. Hamidan gives DOT to a patient on the occasion of inauguration of the DOT centre at Shah-e-Miran Hospital in Ahmedabad

Directly Observed Treatment

Directly observed treatment (DOT) is one of the key elements of the DOTS strategy. In DOT, an observer (health worker or trained community volunteer who is not a family member) watches and supports the patient in taking their drugs. Direct observation ensures treatment for the entire course with the right drugs, in the right doses and at the right intervals.

The most immediate benefit of DOT is the high cure rates associated with assured completion of treatment. Equally important is the reduction in development of drug resistance, because direct observation ensures adherence and reduces the probability of emergence of drug-resistant organisms. Confirmed adherence to treatment further reduces the spread of infection in the community and thereby the burden of disease and development of new cases of tuberculosis.



The key to maintaining the high standards that the programme has achieved is regular monitoring, supervision and evaluation

Table 1 : 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 ₃ R ₃ Z ₃ E ₃ + 4H ₃ R ₃
Category II	Sputum smear-positive Relapse Sputum smear-positive Failure Sputum smear-positive Treatment After Default Others***	2H ₃ R ₃ Z ₃ E ₃ S ₃ + 1H ₃ R ₃ Z ₃ E ₃ + 5H ₃ R ₃ E ₃
Category III	New Sputum smear-negative, not seriously ill New Extra-pulmonary, not seriously ill	2H ₃ R ₃ Z ₃ + 4H ₃ R ₃

*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 histo-pathological evidence of current, active TB. In these cases, the patient should be categorised as 'Others' and given Category II treatment.

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.

Addressing Stop TB Strategy under RNTCP

The Revised National Tuberculosis Programme (RNTCP) Phase II is in line with the new WHO Stop TB Strategy for TB control and covers all the activities proposed under the strategy. The RNTCP is already collaborating with the National AIDS Control Programme (NACP) to address challenges of TB-HIV co-infection and has developed guidelines for management of MDR-TB and is in the process of rolling out DOTS Plus services. 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.

An effective advocacy, social mobilisation and communication strategy is in place, in order to maintain high visibility of TB and RNTCP amongst policy makers, opinion leaders and community, and hence sustain long-term political and administrative commitment and greater community involvement in RNTCP.

The programme with active support of TB Research Centre, Chennai, National TB Institute, Bangalore and Lala Ram Sarup Institute of TB and Respiratory Diseases, Delhi and other academicians in Medical Colleges and research institutes, has been undertaking operational research to generate evidence to inform policy decisions and to assess the magnitude of disease burden and impact of RNTCP DOTS programme.

The International Standards for Tuberculosis Care (ISTC) describes a widely accepted level of care that all practitioners, public and private, should follow in dealing with people who have, or are suspected of having, tuberculosis. The Standards are intended to facilitate the effective engagement of all care providers in delivering high-quality care for patients of all ages, including those with sputum smear-positive, sputum smear-negative, and extrapulmonary tuberculosis, tuberculosis caused by drug-resistant organisms, and tuberculosis combined with human immunodeficiency virus (HIV) infection.

The Standards have been developed by the Tuberculosis Coalition for Technical Assistance (TBCTA) with funding support from the US Agency for International Development. ISTC emerged after a year-long inclusive process guided by a 28-member steering committee that included individuals representing a wide variety of relevant perspectives on tuberculosis care and control. In addition, the document was presented at various public forums with an open invitation for comments. India was intimately involved in the development of the ISTC and a representative of the Indian Medical Association (IMA) was a member of the steering committee that supervised the development of the ISTC document. The RNTCP of the Government of India conforms to the standards prescribed in the ISTC.

Standards for Diagnosis

Standard 1. All persons with otherwise unexplained productive cough lasting two–three weeks or more should be evaluated for tuberculosis.

Standard 2. All patients (adults, adolescents, and children who are capable of producing sputum) suspected of having pulmonary tuberculosis should have at least two, and preferably three, sputum specimens obtained for microscopic examination. When possible, at least one early morning specimen should be obtained.

Standard 3. For all patients (adults, adolescents, and children) suspected of having extrapulmonary tuberculosis, appropriate specimens from the suspected sites of involvement should be obtained for microscopy and, where facilities and resources are available, for culture and histopathological examination.

Standard 4. All persons with chest radiographic findings suggestive of tuberculosis should have sputum specimens submitted for microbiological examination.

Standard 5. The diagnosis of sputum smear-negative pulmonary tuberculosis should be based on the following criteria: at least three negative sputum smears (including at least one early morning specimen); chest radiography findings consistent with tuberculosis; and lack of response to a trial of broad spectrum antimicrobial agents. Because the fluoroquinolones are active against *M. tuberculosis* and, thus, may cause transient improvement in persons with tuberculosis, they should be avoided. In persons with known or suspected HIV infection, the diagnostic evaluation should be expedited.

Standard 6. The diagnosis of intrathoracic (i.e. pulmonary, pleural, and mediastinal or hilar lymph node) tuberculosis in symptomatic children with negative sputum smears should be based on the finding of chest radiographic abnormalities consistent with tuberculosis and either a history of exposure to an infectious case or evidence of tuberculosis infection (positive tuberculin skin test or interferon gamma release assay). For such patients, if facilities for culture are available, sputum specimens should be obtained (by expectoration, gastric washings, or induced sputum) for culture.

Standards for Treatment

Standard 7: Any practitioner treating a patient for tuberculosis is assuming an important public health responsibility. To fulfill this responsibility the practitioner must not only prescribe an appropriate regimen but also be capable of assessing the adherence of the patient to the regimen and addressing poor adherence when it occurs. By doing so, the provider will be able to ensure adherence to the regimen until treatment is completed.

Standard 8. All patients (including those with HIV infection) who have not been treated previously should receive an internationally accepted first-line treatment regimen using drugs of known bioavailability. The initial phase should consist of two months of isoniazid, rifampicin, pyrazinamide, and ethambutol. The preferred continuation phase consists of isoniazid and rifampicin given for four months. Isoniazid and ethambutol given for six months is an alternative continuation phase regimen that may be used when adherence cannot be assessed, but it is associated with a higher rate of failure and relapse, especially in patients with HIV infection. The doses of antituberculosis drugs used should conform to international recommendations. Fixed-dose combinations of two (isoniazid and rifampicin), three (isoniazid, rifampicin, and pyrazinamide), and four (isoniazid, rifampicin, pyrazinamide, and ethambutol) drugs are highly recommended, especially when medication ingestion is not observed.

Standard 9. To foster and assess adherence, a patient-centred approach to administration of drug treatment, based on the patient's needs and mutual respect between the patient and the provider, should be developed for all patients. Supervision and support should be gender-sensitive and age-specific and should draw on the full range of recommended interventions and available support services, including patient counseling and education. A central element of the patient-centred strategy is the use of measures to assess and promote adherence to the treatment regimen and to address poor adherence when it occurs. These measures should be tailored to the individual patient's circumstances and be mutually acceptable to the patient and the provider. Such measures may include direct observation of medication ingestion (directly observed therapy—DOT) by a treatment supporter who is acceptable and accountable to the patient and to the health system.

Standard 10. All patients should be monitored for response to therapy, best judged in patients with pulmonary tuberculosis by follow-up sputum microscopy (two specimens) at least at the time of completion of the initial phase of treatment (two months), at five months, and at the end of treatment. Patients who have positive smears during the fifth month of treatment should be considered as treatment failures and have therapy modified appropriately. (See Standards 14 and 15) In patients with extrapulmonary tuberculosis and in children, the response to treatment is best assessed clinically. Follow-up radiographic examinations are usually unnecessary and may be misleading.

Standard 11. A written record of all medications given, bacteriologic response, and adverse reactions should be maintained for all patients.

Standard 12. In areas with a high prevalence of HIV infection in the general population and where tuberculosis and HIV infection are likely to co-exist, HIV counseling and testing is indicated for all tuberculosis patients as part of their routine management. In areas with lower prevalence rates of HIV, HIV counseling and testing is indicated for tuberculosis patients with symptoms and/or signs of HIV-related conditions and in tuberculosis patients having a history suggestive of high risk of HIV exposure.

Standard 13. All patients with tuberculosis and HIV infection should be evaluated to determine if antiretroviral therapy is indicated during the course of treatment for tuberculosis. Appropriate arrangements for access to antiretroviral drugs should be made for patients who meet indications

for treatment. Given the complexity of co-administration of antituberculosis treatment and antiretroviral therapy, consultation with a physician who is expert in this area is recommended before initiation of concurrent treatment for tuberculosis and HIV infection, regardless of which disease appeared first. However, initiation of treatment for tuberculosis should not be delayed. Patients with tuberculosis and HIV infection should also receive cotrimoxazole as prophylaxis for other infections.

Standard 14. An assessment of the likelihood of drug resistance, based on history of prior treatment, exposure to a possible source case having drug-resistant organisms, and the community prevalence of drug resistance, should be obtained for all patients. Patients who fail treatment and chronic cases should always be assessed for possible drug resistance. For patients in whom drug resistance is considered to be likely, culture and drug susceptibility testing for isoniazid, rifampicin, and ethambutol should be performed promptly.

Standard 15. Patients with tuberculosis caused by drug-resistant (especially multi drug resistant [MDR]) organisms should be treated with specialized regimens containing second-line antituberculosis drugs. At least four drugs to which the organisms are known or presumed to be susceptible should be used, and treatment should be given for at least 18 months. Patient-centred measures are required to ensure adherence. Consultation with a provider experienced in treatment of patients with MDR tuberculosis should be obtained.

Standards for Public Health Responsibilities

Standard 16. All providers of care for patients with tuberculosis should ensure that persons (especially children under 5 years of age and persons with HIV infection) who are in close contact with patients who have infectious tuberculosis are evaluated and managed in line with international recommendations. Children under 5 years of age and persons with HIV infection who have been in contact with an infectious case should be evaluated for both latent infection with *M. tuberculosis* and for active tuberculosis.

Standard 17. All providers must report both new and retreatment tuberculosis cases and their treatment outcomes to local public health authorities, in conformance with applicable legal requirements and policies.



International Standards for TB Care



The Road Ahead

In India, practising RNTCP in its entirety is the only means to ensure that the international standards are observed for the management of TB cases. It is imperative that professional bodies endorse the ISTC and commit that all health care providers shall give care to their TB patients as per the international standards.

The National Task Force on involvement of Medical Colleges in RNTCP (NTF) in its meeting held in November 2006, has adopted and endorsed the International Standards for TB Care, and also

committed that the NTF members shall undertake advocacy for RNTCP with other professional bodies.

The important next step ahead for health professionals in the country is to take these standards to all professional bodies, and through them to all medical practitioners, and seek their commitment to these international standards, which is also their commitment to the principles of the RNTCP. The Indian medical community has to demonstrate its commitment to provide the best possible care in managing patients with tuberculosis, in accordance with international guidelines and standards.



Health Minister of Kerala, Ms. P.K. Sreemathy handing over The TB Patients' Charter to a TB patient

Chapter 3

“We recognise health as an inalienable human right that every individual can justly claim. So long as wide health inequalities exist in our country and access to essential health care is not universally assured, we would fall short in both economic planning and in our moral obligation to all citizens.”

PM Manmohan Singh during the convocation address at the All-India Institute for Medical Sciences in New Delhi, October 2005

National health is important for the overall health of the citizens. As Prime Minister Manmohan Singh rightly said, people have a right to demand healthy lives. With this goal, the Revised National Tuberculosis Control Programme was set up to decrease mortality and morbidity due to TB and cut transmission of infection until TB ceases to be a major public health problem in India. Based on the findings and recommendations of a joint review conducted by Government of India (GoI), WHO and the Swedish International Development Agency, the RNTCP was launched in 1992. It is built upon the infrastructure already established by the previous National Tuberculosis Programme, while incorporating the elements of the internationally

recommended Directly Observed Treatment, Short course (DOTS) strategy for TB control.

Over the past eight years, the RNTCP has expanded rapidly from covering 18 million people in 1998 to the entire population of 1,114 million by March 2006. The Indian TB Control Programme has successfully completed the largest and most rapid expansion of DOTS in history to cover the entire country. Phase II (2006-2011) of RNTCP is a step towards achieving the TB-related UN millennium development goals. The programme has developed a ‘Strategic Vision for TB Control for the country up to 2015’, under which it aims to achieve and



Health Minister Dr. Anbumani Ramadoss addressing the RNTCP Joint Monitoring Mission, October 2006

Table 1: Rapid Scale-up of RNTCP Coverage, 1998 through 2006

Year	Population Covered (millions)
1998	18
1999	130
2000	287
2001	450
2002	530
2003	778
2004	947
2005	1080
March 2006	1114 (100%)

TB-related Millennium Development Goals

Goal 6

To combat HIV/AIDS, malaria and other diseases

Target 8

To have halted by 2015 and begun to reverse the incidence of malaria and other major diseases, including tuberculosis.

Indicators for Target 8 to be used to evaluate the implementation and impact of TB control:

Indicator 23

Between 1990 and 2015, to halve the prevalence and death rates associated with tuberculosis; and

Indicator 24

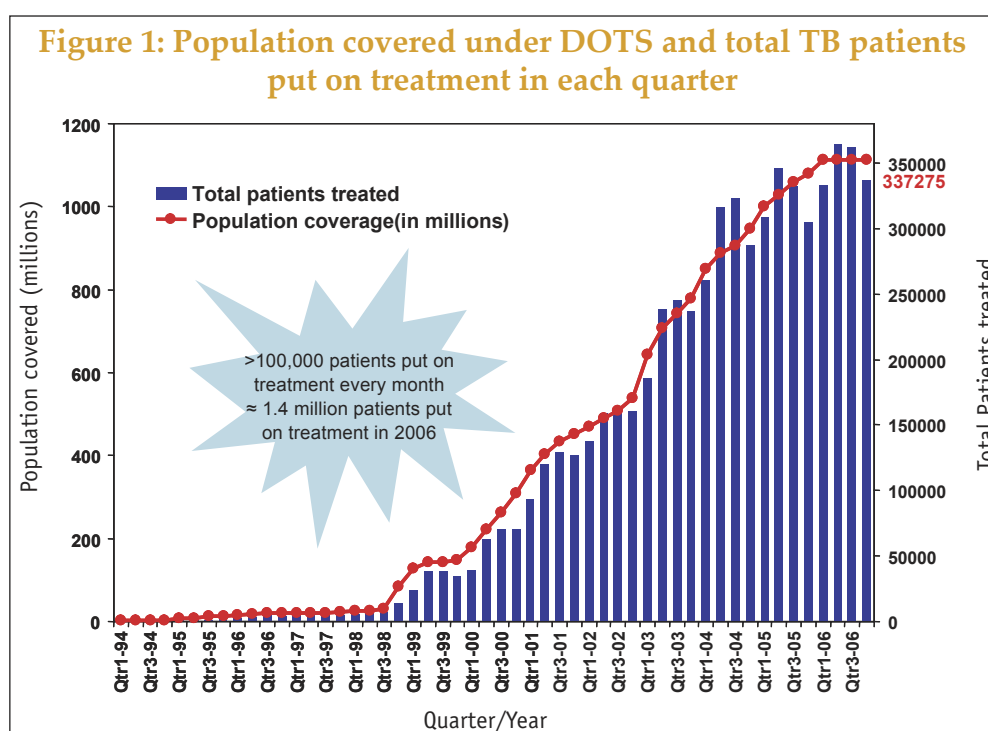
By 2005, to detect 70% of new smear positive TB cases arising annually, and to successfully treat 85% of these cases

maintain a cure rate of at least 85% in new sputum positive pulmonary TB patients, and detection of at least 70% of such cases. The Government of India stands fully committed towards the sustained implementation of the RNTCP as a high quality programme, at least for the next few decades until tuberculosis ceases to be a public health problem.

RNTCP Phase II is making efforts to strengthen the quality of DOTS through implementation of the RNTCP quality assurance protocol for sputum microscopy; decentralised accessible and patient friendly DOT services; pro-active Public-Private Mix (PPM) activities to increase the reach of DOT

services; rational use of standardised first and second line anti-TB drugs; and need based advocacy, communication and social mobilisation to generate awareness and demand for quality services.

New activities have been proposed in RNTCP to provide care and management for up to 5,000 “new” MDR-TB cases a year. The vision is to have a network of RNTCP accredited quality assured state-level Intermediate Reference Laboratories (IRLs), one in each large state, providing culture and Drug Sensitivity Testing (DST) services for RNTCP and to have DOTS-Plus sites, for the case management of MDR-TB patients as per guidelines.



RNTCP Activities 2006

The entire country is now covered by the Revised National Tuberculosis Control Programme, making it the second largest such programme in the world. Since the programme began, the RNTCP has trained over half a million staff in the health system, evaluated more than 24 million people with suspected TB, examined more than 100 million sputum slides and treated more than 6.7 million patients, and thereby prevented almost 1.2 million TB deaths. Alongside this rapid expansion, quality of services has been maintained. The results meet the internationally set a benchmark of a treatment success rate of >85% among new sputum positive pulmonary TB cases. Case detection rates are close to the global target of 70%.

The second phase (2006–2011) of the RNTCP aims to consolidate, maintain and further improve the achievements of the first phase. The main focus is on maintenance and improvement in the quality of RNTCP services by widening the scope for providing standardised, good quality treatment and diagnostic services to all TB patients. An enabling patient-friendly environment is to be provided in whichever health care facility they seek treatment from. This is envisaged to be achieved through scaling up of inter-sectoral collaboration, including

delivery of services through all the existing health provider sectors, e.g. medical colleges, NGOs, private sector, health facilities under other ministries, etc., and also through strengthening of programme management capacity at central, state and district levels by strengthening manpower and training.

RNTCP is also working to mainstream services for marginalised groups such as urban slum dwellers and tribals in terms of improved access to health facilities. Need-based, focused and people-centric Information, Education and Communication (IEC) activities have been regularly organised especially for such people living in hard-to-reach areas. RNTCP trains its programme staff in counselling skills and interpersonal communication to bridge the gap between patients and providers so that they complete treatment and continue to be advocates of DOTS. Enhancing community participation in DOTS is also paramount to the success of the programme.

RNTCP carries out an intensive systematic supervision of activities regularly to increase the efficiency of health workers by developing their knowledge, perfecting their skills, improving their attitudes towards their work and increasing their motivation, and hence ensuring that the services provided are of the highest quality.



DDG (TB) addressing the Joint Monitoring Mission meeting, October 2006

RNTCP gets international recognition – Kochon Prize

The achievements of RNTCP have been recognised on the international forum and the first Kochon Prize has been awarded by the Stop TB Partnership to Dr. L.S. Chauhan, DDG, as a mark of appreciation of TB control activities in India.

Dr Chauhan, the Deputy Director General (TB) with the Union Ministry of Health and Family Welfare, has overseen the speedy expansion of RNTCP to cover the country's entire population of 1,114 million people.



DDG (TB) receiving the prestigious Kochon prize at Paris; Inset - Kochon Medal

Quality Assured Diagnostic Services

A nation-wide network of RNTCP quality assured designated sputum smear microscopy laboratories is envisaged, which provides appropriate, available, affordable and accessible quality assured diagnostic services for TB suspects and cases. To meet the standards of internationally recommended diagnostic practices for TB, the programme provides the supply of quality reagents and equipments to the laboratory network. An in-built routine system has been designed for sputum microscopy external quality assessment (EQA) and for supervision and monitoring of the diagnostic systems by the RNTCP Senior TB Laboratory Supervisor (STLS) locally and by the intermediate (state level) and national laboratory network for RNTCP at the higher levels.

A Central RNTCP Laboratory Committee has been constituted with representatives of the three RNTCP National Reference Laboratories (NRLs), CTD and WHO India as members. This committee meets every quarter and works as a task force to guide and oversee laboratory related activities of the programme.

Laboratory network

The RNTCP laboratory network consists of three designated NRLs, namely the Tuberculosis Research Centre (TRC), Chennai; National Tuberculosis

Institute (NTI), Bangalore; and Lala Ram Sarup Institute of Tuberculosis and Respiratory Diseases (LRS), Delhi. The process for accrediting JALMA Institute, Agra as the fourth NRL has been initiated by the supra-national laboratory (TRC, Chennai). JALMA will also undertake the DRS for the western half of the state of Uttar Pradesh. The state level Intermediate Reference Laboratories (IRLs), and about 12,000 designated microscopy centres (DMCs) are also covered under RNTCP. DMCs in each district are the most peripheral laboratories offering the RNTCP diagnostic services.

It is planned that 24 state level IRLs will be established in the country by the end of RNTCP Phase II (2010-

Achievements

- Diagnostic facilities in nearly 12,000 laboratories throughout the country have been upgraded and established. More than 6.2 million TB suspects have been examined at these facilities in 2006. Systems for quality assurance have been put in place.
- RNTCP is in the process of building up the intermediate reference laboratories capable of undertaking culture and drug sensitivity tests (C/S). By the end of 2007, 12 new state level IRLs would be upgraded to provide C/S facilities.
- The programme is about to roll out DOTS-Plus management for MDR-TB in the states of Gujarat and Maharashtra by early 2007.

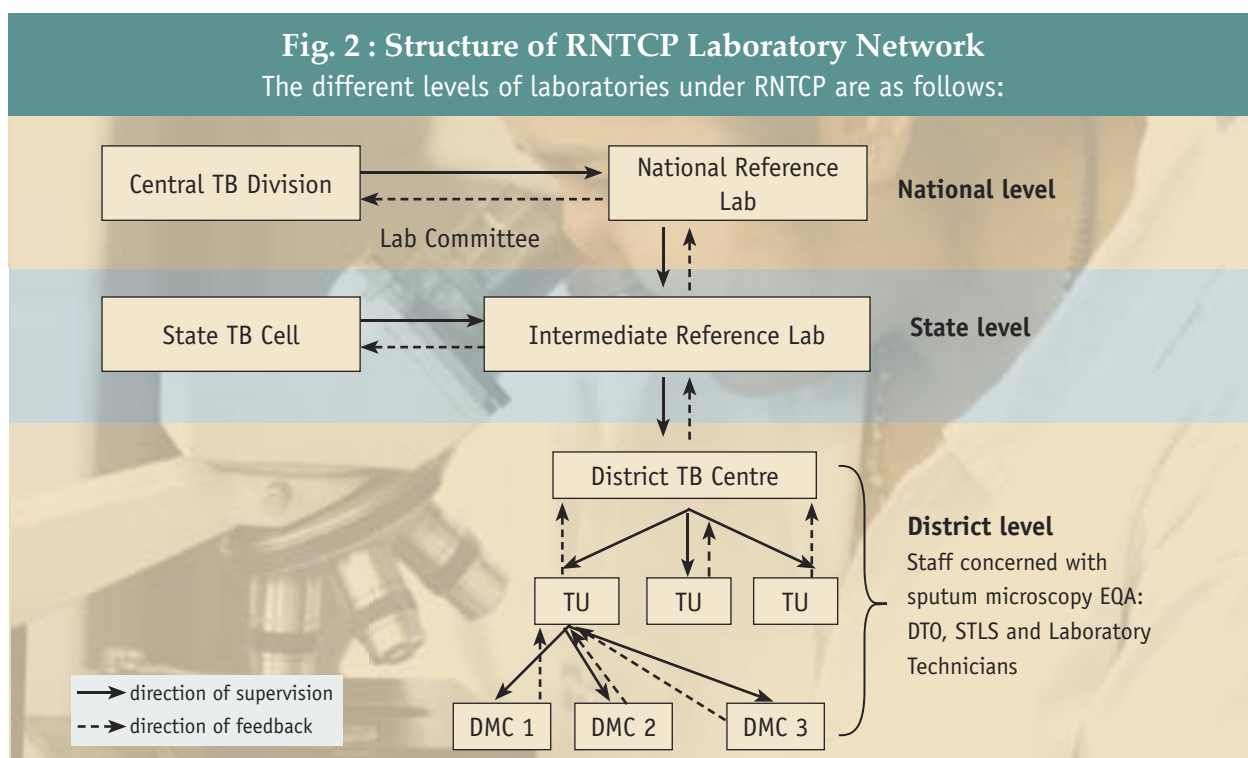
Table 2: States Assigned to NRLs for Monitoring of Laboratory Activities

NRL	States and Union Territories (UTs) assigned for EQA	Total nos. of IRLs assigned	Total nos. of states/UTs assigned	Nos. of districts in the states
LRS	Arunachal Pradesh, Assam, Delhi, Haryana, Himachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Tripura and Uttaranchal	7	11	136
NTI	Bihar, Jammu and Kashmir, Jharkhand, Karnataka, Maharashtra, Madhya Pradesh, Orissa, Puducherry, Rajasthan, West Bengal and Andaman & Nicobar	10	11	277
TRC	Andhra Pradesh, Chandigarh, Chhattisgarh, Goa, Gujarat (& Dadra Nagar Haveli, Daman & Diu), Kerala (& Lakshadweep), Punjab, Sikkim, Tamil Nadu and Uttar Pradesh (2)	10	13	209

11) for undertaking Culture and Drug Sensitivity Testing (DST), and conducting Drug Resistance Surveillance in selected states. A one-time supply of the equipment required for Culture and DST shall be made by RNTCP to the 24 states where IRLs are proposed to be established. The equipment has already been supplied and installed in Gujarat and Maharashtra during Phase I. The supply and installation in Andhra Pradesh, Chhattisgarh, Delhi, Haryana, Jharkhand, Kerala, Orissa, Rajasthan, Tamil Nadu, Uttaranchal and West Bengal is currently underway. The procurement process for Himachal

Pradesh, Karnataka, Madhya Pradesh, Punjab and Uttar Pradesh has already been initiated and these five states are expected to complete any needed civil works for the IRL before the equipment reaches the laboratory sites.

Members of the 2006 Joint Monitoring Mission conducted field visits to 20 randomly selected districts in six states (Gujarat, Haryana, Karnataka, Madhya Pradesh, Punjab and West Bengal) in the month of October 2006. The programme was extensively reviewed in terms of the diagnostic



aspects. The mission stated that the programme is very effective, including the microscopy services for diagnosis, which is a model for other health programmes. It was recommended by the mission to further improve the capacity of the State Tuberculosis Training and Demonstration Centres (STDCs) to plan, analyse and use data for action.

External quality assessment services

A process has been established under RNTCP to assess the laboratory performance utilising the RNTCP External Quality Assessment (EQA) guidelines. All the states in the country have completed training of state level trainers in EQA, and currently 70% of the districts are implementing the quality assurance protocol.

For capacity building of the state level programme managers (STOs and STDC/IRL directors) in EQA, four batches of national level workshops were conducted in 2006. The orientation training was

held at NTI, Bangalore to make them aware of their roles and responsibilities with regard to state level issues such as setting up of IRLs, human resources, conducting effective On-Site Evaluations (OSE) by IRL staff to DMC level, on operational/technical issues, quality specifications for the microscopy staining reagents, and on safe disinfection/disposal of infected wastes.

Recommendations of the annual supervising visits to the states by the NRLs, have focused on operational problems in strengthening of the laboratories and staff in conducting effective OSE visits to districts/ diagnostic centres, panel testing of all STLS, operationalisation of the RBRC procedures, facilities and reporting of results.

The documents for accreditation of IRLs have been developed and those for the accreditation of laboratories in medical colleges for performing culture and DST are in the process of being finalised.

Figure 3 : Reporting System for Quality Assurance System for Sputum Microscopy

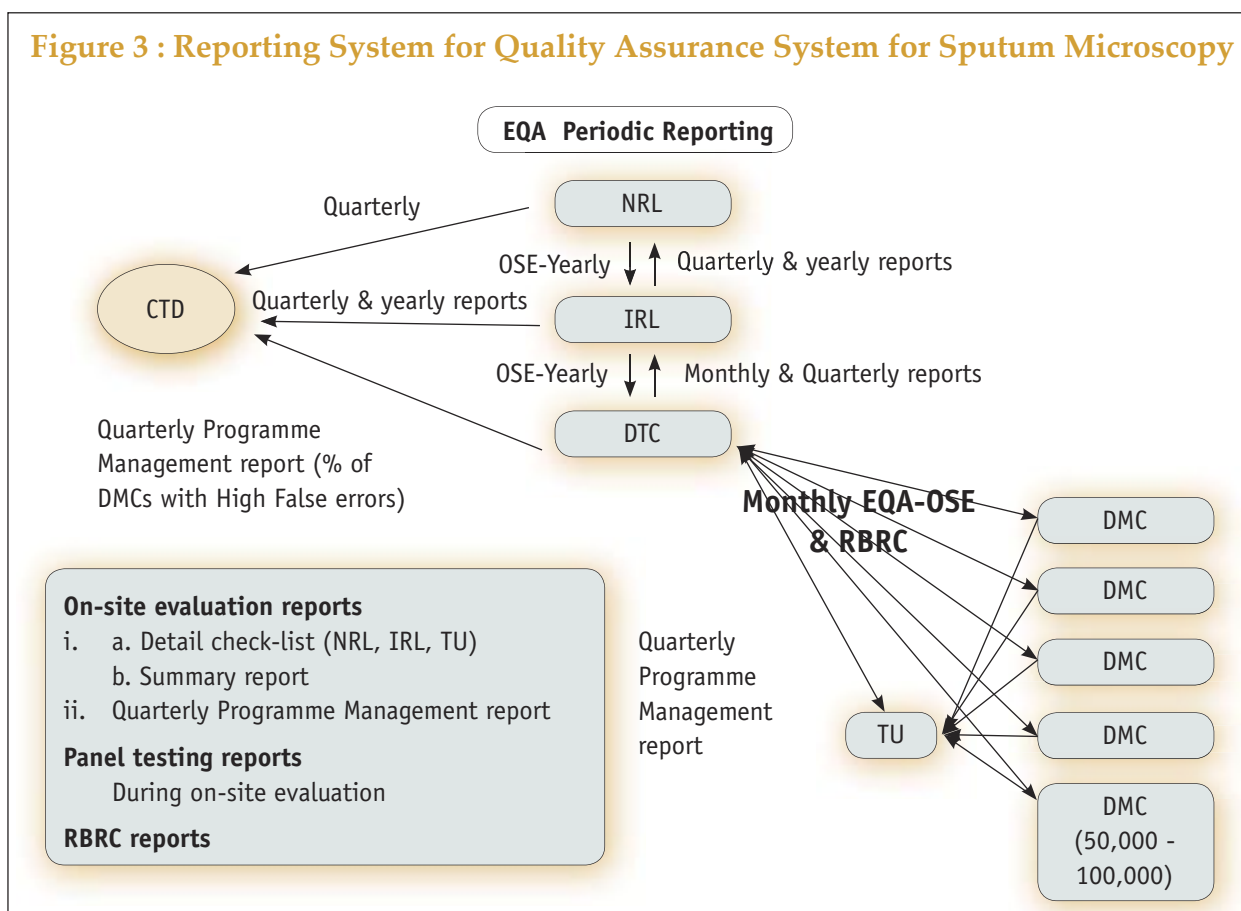


Table 3: List of Designated IRLs and Status of EQA Activities

State	Name of institution where IRL established	EQA		
		OSE	RBRC	Panel Testing
Andhra Pradesh	STDC, Hyderabad	Y	Y	Y
Arunachal Pradesh	STDC, Naharlagun	N	-	-
Assam	Guwahati Medical College	Y	Y	N
Bihar	STDC, Patna	Y	P	Y
Chhattisgarh	Regional Leprosy Training and Research Institute, Raipur	Y	Y	N
Delhi	New Delhi TB Centre	Y	Y	N
Gujarat	STDC, Ahmedabad	Y	Y	Y
Goa	GMC, Bambolim	Y	Y	N
Haryana	PHL, Karnal	Y	P	N
Himachal Pradesh	TB Hospital, Dharampur	Y	Y	N
Jammu	STDC, Srinagar	N	N	N
Kashmir	STDC, Srinagar	Y	Y	Y
Jharkhand	Itki TB Sanatorium	Y	P	N
Karnataka	STDC, Bangalore	Y	Y	Y
Kerala	STDC, Thiruvananthapuram	Y	Y	Y
Madhya Pradesh	STDC, Bhopal	Y	P	N
Maharashtra	STDC, Nagpur	Y	Y	Y
Orissa	STDC, Cuttack	P	P	N
Puducherry	STDC, Puducherry	Y	Y	Y
Punjab	STDC, Patiala Government Medical College	Y	P	Y
Rajasthan	STDC, Ajmer	Y	Y	Y
Sikkim	STDC, Gangtok	Y	Y	N
Tamil Nadu	Institute of Thoracic Medicine, Chennai	Y	Y	N
Uttar Pradesh	STDC, Agra and KGMU, Lucknow	N	N	N
Uttaranchal	STDC, Dehradun	Y	P	N
West Bengal	STDC, Kolkata	Y	Y	Y

Y – Activity performed in all districts as per guidelines

P – Activity performed in some of the districts as per guidelines

N – Activity not being performed as yet

Supervision and Monitoring

RNTCP is a complex programme to implement and manage, both in the technical and programmatic aspects, in a large country like India. It has relatively complicated diagnostic, treatment and follow-up protocols, especially when all these activities are to be supervised and monitored, and the staff held accountable for their provision.

The key to maintaining the high standards that the programme has achieved is regular monitoring, supervision and evaluations. 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.



DTO of West Garo Hills, Meghalaya, on a visit to a patient's home

Supervision and monitoring strategy

The programme has developed an 'RNTCP Supervision and Monitoring Strategy' as a document to be used for objective review of the programme at all levels. The strategy lists the detailed procedure for conducting supervisory visits and tools for objective review. The supervisory protocol provides the number of visits each level of staff is expected to make to review the programme at the field level. During each visit, patients are also interviewed at their homes. Checklists have been developed to conduct the interviews. Besides supervisory visits, clear monitoring indicators to review the quality of performance are laid out in the strategy document.

The supervision and monitoring strategy clearly defines the supervisory activities to be done by each

programme manager at different levels (Table 4). Tools for each level of supervising activities are clearly stated in the strategy document.

In addition to the routine supervision and monitoring by the programme staff, each state conducts internal evaluations of two districts in each quarter. Central level evaluations are conducted by the team from Central TB Division with one to two districts being reviewed each month.

Evaluation

RNTCP has now moved into a phase of consolidation and maintenance from an initial phase of implementation. Since it has been hailed as the fastest expanding programme in the world, maintaining the quality of implementation is a challenge, for which stringent measures for quality checks have been adopted. The first level of evaluation is done by the state and subsequently it is double-checked by the centre. Evaluations have become an integral part of the supervision and monitoring strategy of RNTCP. It plays a vital role in ensuring transparency, empowering personnel and maintaining expected international standards of TB control.

In 2006, about 125 districts were evaluated by their respective states. Over ten states have been evaluated by the Central Unit in the last 12 months.



RNTCP review meeting for North-eastern states, November 2006

Table 4: Supervision and Monitoring Activities and Tools under RNTCP for Each Level of Programme Implementation

Unit responsible (persons)	S & M Activities	Tools
Central Unit [Deputy Director General (DDG)/ Chief Medical Officers (CMOs)/ WHO India team/ NRL/CTD RNTCP-WHO Consultants]	<ul style="list-style-type: none"> Undertake programme reviews with State TB officers at national level twice a year Conduct periodic review of RNTCP in the states with the DTOs during state level review meetings Conduct Central level internal evaluations of at least 2 districts every month NRL Team to visit IRL (for On-site evaluation and Panel testing) at least once every year 	<p>Programme reviews</p> <p>Annual programme report (National)</p> <p>6-monthly programme review with State TB Officers (STOs)</p> <p>Quarterly and annual State Reports</p> <p>District evaluation reports</p> <p>Monthly activity reports of STOs</p> <p>Monthly reports of RNTCP-WHO Consultants</p> <p>Report from Medical College ZTFs</p>
State TB Cell (STO/MO/STDC Director/ IRL Microbiologists/ RNTCP-WHO Consultants)	<ul style="list-style-type: none"> Visit all districts in the state at least once every 6 months Undertake state level internal evaluations of atleast 2 districts every quarter IRL team to visit DTC at least once a year Conduct quarterly review meetings with the district TB officers at state level. Meeting to be chaired by Health Secretary/ Director General of Health Services (DGHS) 	<p>Annual programme report (State and districts)</p> <p>Quarterly programme review with District TB Officers (DTOs)</p> <p>Quarterly District/TU reports</p> <p>District evaluation reports</p> <p>Monthly activity reports/tour diaries of DTOs</p> <p>Tour diary of STO/supervision checklist</p> <p>Report from Medical College STF</p>
District TB Centre (District TB Officer/ 2nd MO DTC)	<ul style="list-style-type: none"> Reserve 3–5 days in a week for field visits (between DTO and 2nd MO) Visit all TB Units every month. Visit all Microscopy Centres every quarter Visit the homes of at least 3 randomly selected NSP patients and their DOT providers on every field visit day. Visit to Medical College if any, every month Conduct DTCS review meetings every quarter – to be chaired by DM Conduct monthly review meeting at the DTC – to be chaired by DM/CMO 	<p>Annual district report</p> <p>Quarterly TU reports</p> <p>Monthly programme review</p> <p>Monthly PHI reports</p> <p>Quality assurance report</p> <p>Tour diary of DTO/supervision checklist</p> <p>Monthly activity reports of MOTCs, STSs and STLSs</p> <p>RNTCP TB register</p> <p>Supervision register</p> <p>Referral for treatment register</p> <p>Supervisory checklist</p>
Medical Officers (TB Control)	<ul style="list-style-type: none"> Reserve at least 7 days in a month for field visits. Visit all Microscopy Centres every month. Visit most of the participating private as well as public Peripheral Health Institutions (PHIs) every quarter. Visit the homes of at least 3 randomly selected NSP patients along with their DOT providers on every field visit day. Conduct fortnightly review meeting with STS/STLS 	<p>RNTCP TB register</p> <p>RNTCP Laboratory register</p> <p>Supervision register</p> <p>PHI monthly reports</p> <p>OSE QA reports of STLS</p> <p>Supervisory checklist</p>
STLS	<ul style="list-style-type: none"> Visit all the Microscopy Centres at least once every month. Conduct OSE at the DMC 	<p>Laboratory Register</p> <p>OSE Checklist</p>
STS	<ul style="list-style-type: none"> STS should visit all DMCs and PHIs at least once every month. The STS should visit all the smear positive patients within one month of starting treatment. 	<p>TB register</p> <p>Laboratory register</p> <p>Treatment cards</p> <p>Referral for treatment register</p> <p>Supervisory checklist</p>

All districts have benefited from these evaluations and the administrators have taken active steps to comprehend the needs of the programme and make adjustments to suit the local requirements. Capacity of districts is built to enable them to evaluate their own data and learn from the deficiencies to ensure that patients receive treatment as envisaged by the 'international standards for TB care'.

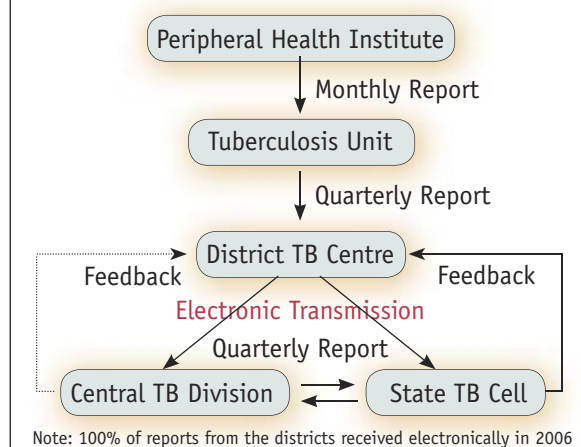
Recording and reporting

Routine reporting is generated from the peripheral health institution (PHI)¹ level upwards. The PHIs and designated microscopy centres (DMC) report on a monthly basis to the Tuberculosis Unit (TU) in relation to logistics, microscopy and treatment initiation activities, which in turn submits quarterly reports to the districts.

At the district level, the DTO is responsible for the preparation of the district level quarterly reports from the respective TU level reports. The district level quarterly reports are then submitted to the State TB Officer and to the Central TB Division (CTD) electronically. Under the RNTCP, all District TB Offices are supplied with a computer with internet facilities, a data entry operator and individual email addresses. The programme uses custom made software, 'Epi-Centre', based on the 'Epi-Info' software, for data entry, analysis and transmission.

The quarterly reporting system used in RNTCP enables analyses of cohorts of patients. A cohort in this context is a group of patients who were registered for treatment in a specified area over a specified period of time. This information helps district, state and national levels to assess the performance and monitor the implementation of the programme. Some of the important changes to the quarterly reporting formats include:

Figure 4:
Programme surveillance system



- Obtaining disaggregated data on paediatric patients registered under RNTCP (for all types of cases) – to have estimates on the proportion of paediatric cases under DOTS and in calculating requirements for paediatric patient-wise drug boxes;
- Sputum conversion rates for new and all re-treatment cases (relapse, TAD, failure); and
- Modifications in programme management report to include revised EQA data (on RBRC), PPM (no. of NGOs/PPs and medical colleges involved), quality of DOTS indicators, HRD-related issues – training and re-training conducted and supervisory activities, IEC activities and financial management and fund status at the end of every quarter.

Electronic transfer of data

Every quarter, the states provide routine feedback to each of their districts on the quarterly performance of the respective district. As part of the capacity building exercise, the central level only provides additional feedback to the state and highlights the important issues and areas for improvement

¹ For the purpose of RNTCP, a PHI is a health facility which is manned by at least a medical officer (even if the post is currently vacant). At this level are the dispensaries, Primary Health Centres (PHCs), Community Health Centres (CHCs), referral hospitals, major hospitals, speciality clinics/hospitals (including other health facilities)/TB hospitals/medical colleges within the district. All health facilities in the private/NGO sector participating in RNTCP are also considered as PHIs under the programme. Some of these PHIs will also be DMCs. All PHIs with/without DMCs should submit a monthly PHI level report to the respective TUs and the district.

and action – technical and administrative – on the quarterly performance to the respective states. Further, many states hold quarterly programme review meetings chaired by high-level health officials such as the Principal Secretary, Health Secretary and/or Joint Secretary of Health. In an increasing number of districts, analysis of the quarterly data is being performed not only for the district and TU levels, but also for the microscopy centre level.

The quarterly performance report is a published document, both in printed and electronic form on the RNTCP website (www.tbcindia.org), which ensures wide dissemination of the report, not only to the programme officers but also in the public domain. Annual results of the programme are published in the yearly “TB India - RNTCP Status Report”. This document is also available in printed and electronic form via the programme website. RNTCP annual data is also reported on an annual basis to WHO Geneva for inclusion in the WHO Annual Global TB Report. Some of the states, namely Andhra Pradesh, Gujarat, Madhya Pradesh, Rajasthan and West Bengal, publish their respective state quarterly performance reports with detailed TB Unit-wise analyses.

The programme has developed a windows-based Epi-Centre software which has several advantages over the previous DOS-based version. The software has been pilot-tested in West Bengal and Rajasthan with encouraging results and will be introduced in the remaining states during 2007.

Human Resource Development

Human resource development (HRD) under RNTCP goes beyond ‘training specific personnel for specific tasks’. It includes management of personnel, in addition to maintaining constant, high quality standards of training. Hence, the target is to achieve sustained professional competency in TB control activities that will benefit not just the states, but also the country at large. Since March

2006, when the country has been fully covered under RNTCP, more than 80% of the personnel manning key posts like Medical Officer (MO), Senior Treatment Supervisor (STS), Senior TB Laboratory Supervisor (STLS) and Laboratory Technician (LT) have been trained in RNTCP. Newer categories of human resources included in the training programme are staff of Medical Colleges, NGOs, Private Practitioners (PPs) and community DOT providers. In addition, the states conduct continuous induction training programmes for new and turnover staff.

Training and retraining

RNTCP has conducted training of more than 500,000 health personnel of various cadres to date. It is a long and arduous task, but is significant in its contribution to the efficient functioning of such a large public health programme.

A series of modular training courses with printed material has been developed for all levels of staff ranging from the State TB Officers to the community DOT providers. Over the last three years, all RNTCP training modules have been updated and newer guidelines, modules and training programmes have been added to the existing training packages. The training material for key TB personnel has a section on Improved Interpersonal Communication (IPC) skills.

All the training modules and guidelines are available on RNTCP website www.tbcindia.org

There are three types of training for the personnel providing RNTCP services:

Initial RNTCP training

This includes all induction trainings in RNTCP of newly placed staff or replacement staff following staff turnover. It consists of modular training for Medical Officers, STS, STLS, LTs and Multi-purpose Workers (MPWs), and initial training of NGO and private practitioners in RNTCP.

The CTD, in collaboration with National AIDS Control Organization (NACO), has developed a range of training packages which address the issues of TB/HIV. Such trainings are currently ongoing in the 14 states implementing TB/HIV collaborative activities. Training is also being given to NGOs who are involved in HIV/AIDS activities and/or TB related activities.

Apart from general health service staff, the involvement of medical colleges in RNTCP is a high priority. Medical college professors have an important role in TB control as opinion leaders and trendsetters, in sustaining the programme by teaching and practising DOTS, and most important of all as role models for other practising physicians. A national task force and five zonal task forces (ZTF) have been formed for their effective involvement in RNTCP.

Re-training

These trainings are mainly for individuals who, have already received initial RNTCP training, but who during supervision, have been identified to require re-training. For these individuals, training is need-based and hence the concerned staff may need re-training on the complete set of initial training modules, or only on sections related to specific activities.

In addition, during supervisory visits by the STO, STDC personnel, DTO, etc. persons requiring re-training in specific areas are identified and need-based training is conducted on relevant sections of the modules, as found appropriate.



RNTCP workshop on PPM-DOTS held at Muradabad, January 2006

Updates on new activities and initiatives

As the RNTCP introduces new activities and initiatives, it is important that the field staff are updated on these areas. These updates are planned mainly during routine activities such as the regular programme review meetings.

A large number of medical staff of NGOs and private practitioners (PPs) is being sensitised either through the Indian Medical Association (IMA) or at their institutions/clinics. To impart quality training, an RNTCP training module has been developed to specifically meet the needs of this group of doctors. With the recent launch of the International Standards for TB Care (ISTC), a summary of the ISTCs and the standards themselves have been included in the RNTCP training material for PPs. The medical practitioners of the NGOs, PPs and other sectors like railways, mines, ports, etc. are trained for six hours over one or two days as per their convenience.

For human resource development to deliver results, empowerment of staff and ownership of the programme at all levels is necessary. It is envisaged that sufficient political and administrative commitment will be cultivated at the state level to ensure this aspect. Well delineated responsibilities and levels of authority along with clear guidelines for activities under the programme will enable timely, appropriate and effective decision-making. Having competent and committed staff available at all levels will contribute to further reducing the information gap.

Public Private Mix in RNTCP

The government is committed to providing quality assured free treatment to TB patients in the country irrespective of the healthcare sector from where they seek treatment. Though the diverse health care facilities under various government, private and non-governmental health sectors manage TB patients, a considerable proportion of the health facilities under these health sectors have not yet adopted RNTCP. The RNTCP has been trying to set up collaborations with all the major health care facilities



National workshop for state leaders and RNTCP coordinators of the Indian Medical Association, August 2006

since its implementation. The programme employs Public-Private Mix (PPM), which is a strategy to diagnose and treat TB patients reporting to all sectors of health care under RNTCP through a mix of different types of health care providers. However, the efforts by the programme to make RNTCP services available through all sectors of health care are to some extent challenged by the diversity and the rapid growth of the non-public health sectors especially the private sector. Several competing forces like the rapidly growing drug market and its influence on the prescription practices of medical practitioners have also been identified as factors working against the PPM initiatives of RNTCP.

PPM tools available

RNTCP has developed and disseminated guidelines for involvement of non-governmental organisations (NGO) and private practitioners (PP), an advocacy kit containing materials and documents for sensitising medical practitioners and a concise training module for a six-hour training on RNTCP. All these documents are available on the RNTCP website.

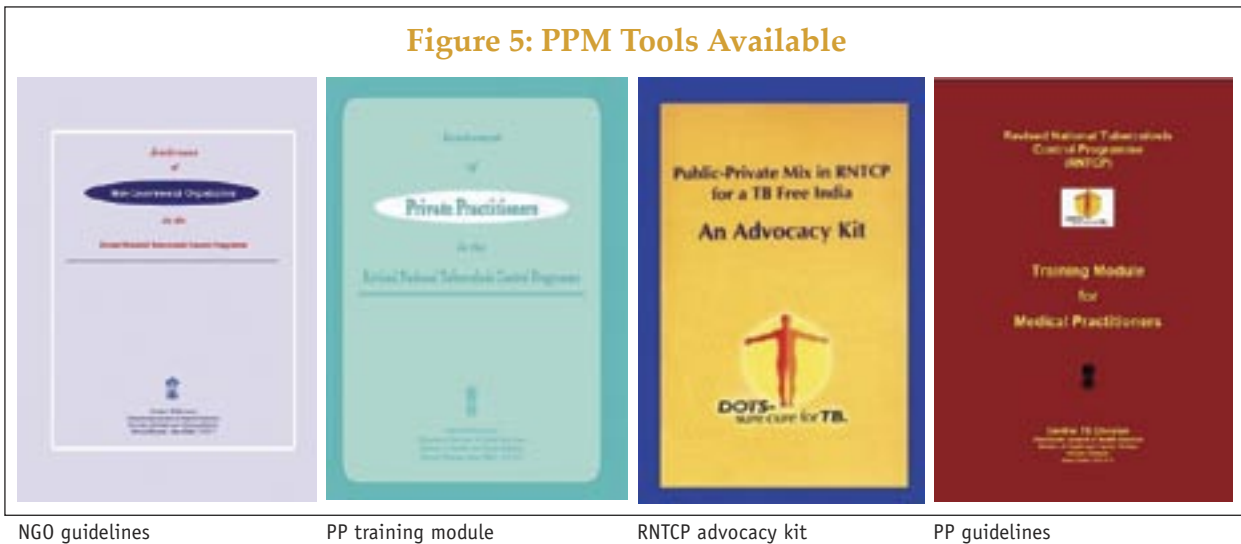
Private sector

The private sector has a wide spectrum of providers ranging from individual practitioners to tertiary

care and multi-speciality hospitals. The non-allopathic systems also have a large variety of private practitioners ranging from untrained traditional healers to qualified indigenous practitioners. There have been efforts at the national level complemented by the local programme managers to involve the private sector in RNTCP. Currently more than 14,500 private practitioners are involved in RNTCP.

The Indian Medical Association (IMA), a major partner of RNTCP, has formed a “National Cell for the RNTCP” and identified coordinators at national and state levels. A national workshop for the state presidents/secretaries and the RNTCP coordinators, supported by the Central TB Division and the WHO India, was held at Surajkund, Haryana in August 2006. The IMA formulated a national action plan in this workshop. A proposal from the IMA for involving medical practitioners in five states namely Andhra Pradesh, Haryana, Maharashtra, Punjab and Uttar Pradesh and the union territory of Chandigarh, has been approved by the GFATM for inclusion in the Round 6 of grants. Andhra Pradesh, Karnataka, Kerala, Maharashtra, Orissa, Rajasthan and Uttar Pradesh have conducted state level sensitisation workshops for IMA leaders.

Figure 5: PPM Tools Available



RNTCP has also been collaborating with other important professional organisations. Building upon the joint consensus statement on management of Paediatric TB, RNTCP continued to strive for strengthening professional consensus on RNTCP with the Indian Academy of Paediatrics. RNTCP also pro-actively participated in the conferences and workshops organised by bodies like the IMA, Indian Association of Preventive and Social Medicine, National College of Chest Physicians, Indian Chest Society, Indian Public Health Association, Family Physicians' Association, etc. Resource persons from

CTD, NTI, TRC, LRS, WHO and also faculty members from the Medical College Nodal Centres for RNTCP participated in these events.

Non-governmental organisations (NGOs)

A total of 2200 NGOs have formal agreements with the RNTCP. Bigger NGOs like World Vision, mission hospital associations like Christian Medical Association of India (CMAI), Christian Health Association of India (CHAI), R.K. Mission, etc. are collaborating with RNTCP at national and state levels. An NGO, 'SHISH' is managing seven TUs in two districts in West Bengal in the difficult riverine belt of Sunderbans.

Medical colleges

RNTCP has always recognised the critical role of Medical colleges in TB control as opinion leaders and trendsetters, and as teachers imparting knowledge and skills to future generations of medical practitioners, and has thus actively sought their involvement to ensure the long-term success of the programme. In 2006, the partnership between Medical Colleges and RNTCP has strengthened further, and several important achievements have been made by this unique and successful partnership between teaching institutions and a public health programme.

For effective implementation of the programme in Medical Colleges, the programme functions through



Dr. L.S. Chauhan, DDG (TB) inaugurating a designated microscopy centre in a private hospital in Delhi owned by Dr. Vinay Aggarwal, the national secretary of IMA



Private doctors in a DMC during RNTCP training

a Task Force mechanism at the National, Zonal and State levels. By February 2006, State Task Forces were formed in all 27 States/UTs with Medical Colleges. Zonal task forces have been constituted in five zones of the country, catering to the medical colleges located in the North, South, East, West and North East zones of the country. RNTCP has established 7 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 Task Forces and in the National Task Force.

All the five zones have had highly successful and well-attended zonal task force (ZTF) workshops during 2006, held between August and October

2006, at Indira Gandhi Medical College (Shimla), Gandhi Medical College (Hyderabad), Rajendra Institute of Medical Sciences (Ranchi), B J Medical College (Ahmedabad) and Sikkim Manipal Institute of Medical Sciences (Gangtok), respectively. Each ZTF workshop included an open scientific update session, which was open to all medical college faculty and residents of the host college and other local practitioners, in addition to the ZTF participants from all medical colleges in the zone. The ZTF workshops included group work sessions to evolve various policy and implementation aspects of Medical College involvement in RNTCP, and the evolution of State-specific action plans with timelines. Representatives of all Medical Colleges in the zone, the STF Chairpersons, STOs and other programme officials actively participated in these zonal workshops.

As of December 2006, more than 230 Medical Colleges across the country were involved in the RNTCP, and the vast majority of medical colleges in the country have already established an RNTCP microscopy-cum-treatment centre in their respective institutions. During 2006, Medical Colleges played an active role in programme planning, implementation and evaluation, including operational research (formulation of generic protocols, participating in the state OR committees, and by undertaking

MAITRI NGO's significant contribution to RNTCP

Set up by an Italian lady named Adriana Ferranti in Bodhgaya, Bihar in 1987, MAITRI Charitable Trust is now associated with RNTCP through Scheme 2 and 4 for NGOs. MAITRI covers 7 blocks. It has a network of 276 trained DOT providers spread over an area having approximately 2,50,000 population. The Designated Microscopy Centre of MAITRI is contributing to more than 50% of smear positive patients detected in the Tuberculosis Unit. MAITRI has also opened 2 sputum collection centres in difficult to reach areas and linked them to Government DMCs. MAITRI conducts IEC activities and contacts the TB patients through patient provider interaction meetings. MAITRI has also sensitised large numbers of opinion leaders.



Ms. Adriana Ferranti, who runs the NGO MAITRI in Bodhgaya, Bihar

studies), in the planning and implementation of disease prevalence surveys, in the development of national guidelines for DOTS-Plus for management of MDR-TB, in the External Quality Assessment system of RNTCP, in TB/HIV coordination and also by their participation in programme reviews and evaluations, including the Joint Monitoring Mission 2006, and in various internal evaluations throughout the year.

The National Task Force, under the leadership of All India Institute of Medical Sciences (AIIMS), organised the fifth National Task Force workshop and a national level CME and Operational Research programme during 9th to 11th November, 2006. This was attended by faculty members from Medical Colleges located in various parts of the country, in addition to the members of the National task Force and the Chairpersons of ZTF and STFs, and other Programme officers. Based on the group work conducted in the National Task Force workshop,

the NTF issued a 'Sensitisation CD' comprising standard presentations on RNTCP and other reference material, which could then be used by Medical College faculty for sensitisation of faculty, residents and other practitioners. The NTF also endorsed the International Standards for TB Care, and issued a statement promoting rational use of second line anti-TB drugs and the prevention of MDR and XDR Tuberculosis. Recommendations on the referral and treatment mechanism, quarterly reporting system, improving co-ordination within medical colleges and with the public health functionaries, and on TB/HIV co-ordination, were also discussed and issued by the NTF.

Over 120 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



The National Task Force Workshop and CME/OR Programme, AIIMS, New Delhi, November, 2006



Meeting of National Task Force, November 2006



Group work during the Zonal Task Force Meeting, South Zone, Hyderabad, Sept. 2006

CD now available, is expected to further boost the process of sensitisation of Medical College faculty, residents and staff.

Operational Research (OR) has been an area of priority under RNTCP, and Medical Colleges have been encouraged to participate in OR projects and to submit OR proposals for RNTCP funding. In December 2005, detailed guidelines for OR projects submission, approval and funding were issued by CTD, as recommended in the NTF, and an increasing interest in submission of OR proposals is now evident. An operational research workshop for medical college faculty was organised by TRC, Chennai, in September 2006, which led to the development of three draft generic OR protocols. As part of the NTF also, a half-day OR programme was organised on 9th November 2006. The State OR committees have now been formed in an increasing number of states, which are vetting and encouraging OR proposals, and the formation of Zonal OR Committees is also underway.

Other central government departments/PSUs

There have been workshops at national and state levels to review and improve the involvement of different central government departments and the public sector undertakings. A national CME cum workshop was conducted for ESI in Delhi which was attended by representatives from 22 centrally owned ESI hospitals from different parts of the country. All the doctors of CGHS in Delhi were trained in RNTCP. In Chennai, all the 18 CGHS clinics including the polyclinics are involved as referral or DOT centres. A DOT centre was inaugurated at the Military Hospital, Namkom, Jharkhand which is a chest diseases centre with 525 beds exclusively for indoor treatment of respiratory diseases.

BR Singh Hospital of Eastern Railway in Kolkata, which is a designated microscopy centre, puts on treatment an average 50 TB cases under RNTCP each quarter. All TB patients attending this hospital



Shri Ashok Bhatt, Health minister of Gujarat inaugurating West Zone Task Force meeting of Medical Colleges

including the paediatric cases are treated as per RNTCP guidelines. The patients from other TUs are referred back to their respective TUs after diagnosis and their entry into the RNTCP is followed up through phone calls. The space for the DMC and DOT centre are provided by the railways. The laboratory technician is provided by an NGO. The laboratory reagents are supplied by the district TB control society. This is an example of good partnership between different health sectors. RNTCP also supervises the activities. The Railway Hospital in Perambur, Chennai which is a 505-bedded hospital with 206 medical officers is involved in RNTCP. In 2006, 151 cases were registered and 145 cases were referred for treatment.



Dr. Sujata Basu, medical officer in charge of the DMC cum DOT centre in BR Singh Hospital (Eastern Railway), Kolkata

Corporate sector

RNTCP has had interactions with the major organisations of the corporate houses like Confederation of Indian Industries (CII), World Economic Forum, Federation of Indian Chamber of Commerce and Industry (FICCI) and the trade unions. An interactive workshop with corporate companies like NTPC, Jubilant Organosys, BD, etc. was held in Delhi at the headquarters of the CII following which companies like BD at Bawal, Haryana have become involved in RNTCP activities. Currently over 120 corporate health facilities are involved in RNTCP. The Steel/Aluminium Plants, Cement Factories, National Thermal Power Corporation, Petrochemicals Industries, Bharat Heavy Electricals Limited (BHEL) have Microscopy centres. Jute mills, mines and sugar mills have DOT centres. The tea gardens in Jalpaiguri, West Bengal and Dibrugarh, Assam have Microscopy and DOT centres in the estate health facilities. Nehru Shatabdi Chikitsalay, Jayant, a multi speciality hospital of

the Northern Coalfields Limited in Sidhi district of Madhya Pradesh is a DMC.

Intensified PPM

The intensified PPM activities were expanded to 70 districts in 2006. The supplementary surveillance system implemented in the original 14 intensified pilot PPM DOTS districts continue to capture disaggregated data from the different health care provider categories. In these pilot sites, 6,200 private practitioners, 520 NGOs, 75 medical colleges, and 33 corporate sector facilities are involved in the programme.

Analyses of the reports from the intensified PPM sites have shown a steady and gradual increase in the number of cases notified under RNTCP. In all the sites, the public health department of the State government has remained the largest contributor to case detection. Medical Colleges, though fewer in number, have contributed a sizeable proportion of cases. This has been an important finding which has highlighted and

Figure 6: Summary of Contribution by Different Health Sectors in 14 Intensified Urban PPM Sites; 2006

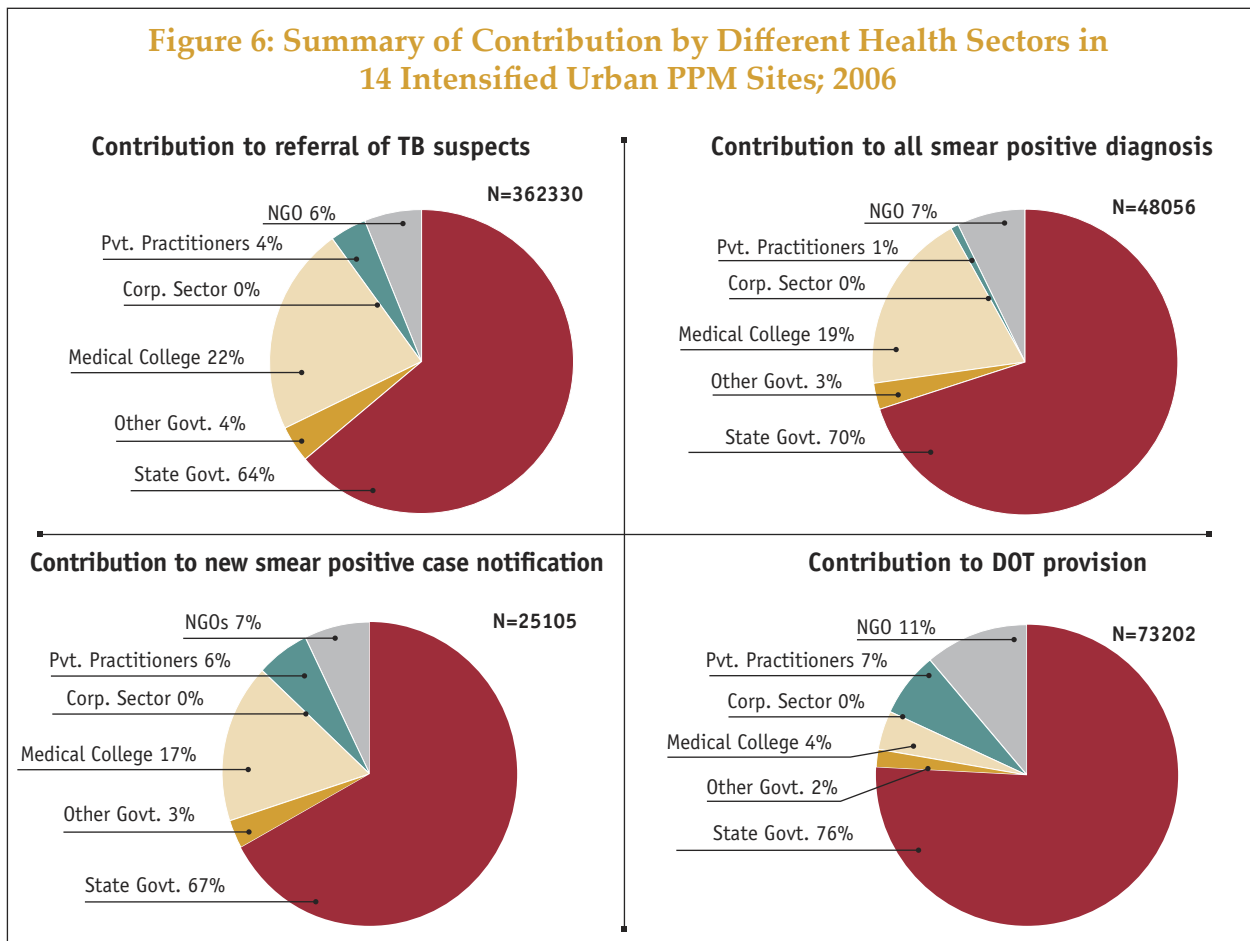


Table 5: Healthcare Providers in India

Healthcare providers in India		
Public	Non-public	
Departments under State Governments	Departments under Central Government	Non-Government
<ul style="list-style-type: none"> Public health department (primary health centres, dispensaries, hospitals) Medical education department (medical college hospitals) Municipal administration department (health care facilities under local governments) Non-allopathic systems of medicine (Ayurveda, Homeopathy, etc.) 	<ol style="list-style-type: none"> Under Ministry of Health and Family Welfare (MoHFW) <ul style="list-style-type: none"> Central Health Services Medical Colleges Central Government Health Services (CGHS) Ministries besides MoHFW <ul style="list-style-type: none"> Railway hospitals (Railway Ministry) Employees' State Insurance (Labour Ministry) Coal department (Ministry of Mines) Port hospitals (Ministry of Shipping) Steel plants (Ministry of Steel) Armed forces hospitals (Ministry of Defence) Refineries (Ministry of Petroleum & Natural gas) Thermal plants (Ministry of Power) 	<ul style="list-style-type: none"> Private hospitals Private practitioners NGO health facilities Corporate industries Non-allopathic practitioners Traditional healers, etc.

reinforced the importance of initially prioritising and targeting of PPM DOTS activities on those facilities which are utilised by the largest number of patients, rather than attempting at the start to involve all facilities irrespective of their caseloads. This is even more important where resources for such activities are limited as in India. The NGO sector has been shown to be an important source for care, especially in the delivery of treatment, in select areas. However, because of the large number of providers involved in the private sector, the yield of cases from the private sector to RNTCP has not been proportionate to the number involved. This is because there are numerous private clinics and hospitals in the urban areas and the individual facilities do not have large patient loads and TB suspects visiting them. Another important finding has been that the intensified PPM-DOTS activities have strengthened the Government health sector involvement in the programme, leading to an increased case detection from the sector.

Urban DOTS projects

The Central TB Division has undertaken 4 Urban DOT projects funded through GFATM round

2 in Hyderabad, Indore, Mumbai, and Varanasi which have large numbers of slum dwellers and migrant populations. The “Urban TB Control Projects” have been established in these sites for improving the quality and reach of RNTCP to special groups such as the slum dwellers and migrants, through more “patient friendly” treatment observation, involvement of private and NGO sectors and IEC.



The team which led the economic evaluation of PPM at Bangalore during a data analysis workshop at NTI, Bangalore



IMA leaders of western Uttar Pradesh on a field visit during RNTCP sensitisation workshop at Moradabad

Operational Research on PPM

The operational research on the economic evaluation of the intensified PPM DOTS in Bangalore city was completed. The National TB Institute (NTI) Bangalore, was the nodal agency which conducted the study. More than 1000 patients receiving RNTCP treatment have been surveyed. The study received technical support from the WHO headquarters in Geneva as well as WHO India. The data analysis is being done.

International Standards for Tuberculosis Care (ISTC)

The RNTCP has adopted the recently published “International Standards for TB Care” (ISTC) document to improve the standards of TB management across all sectors of health care in India, and to recruit and involve additional health care providers in RNTCP activities.

A senior member of the Indian Medical Association was nominated by the RNTCP to be the representative of a professional association from India on the global steering committee, which supervised the development of the ISTC document. A summary of the ISTC document, including the actual standards themselves, has been incorporated into the existing RNTCP training module for medical practitioners (PPM

module). As the RNTCP conforms to the standards laid down in the ISTC, the programme expects all providers of health care to adopt RNTCP to ensure adherence to the internationally recognised standard of care for TB. In India, practising RNTCP in its entirety is the means to ensure that the international standards are observed in the management of TB cases.

Paediatric TB

Tuberculosis is a major cause of childhood morbidity and mortality. It is estimated that about 6-8% of all new TB cases are in the paediatric age group. Although children can present with TB at any stage, the majority of the cases are seen in the 1-4 years due to their low resistance to prevent progression of infection to disease. Children are also prone to suffer from serious forms of TB. The management of pulmonary TB in children under RNTCP is given as under.

Paediatric TB is generally less infectious. It is generally not accorded high priority as it is less infectious. The immunity to resist TB infection is usually low in children less than five years of age, which makes them highly susceptible. The serious forms of TB are more common in children and they are more likely to die if not treated properly. Childhood TB is a reflection of

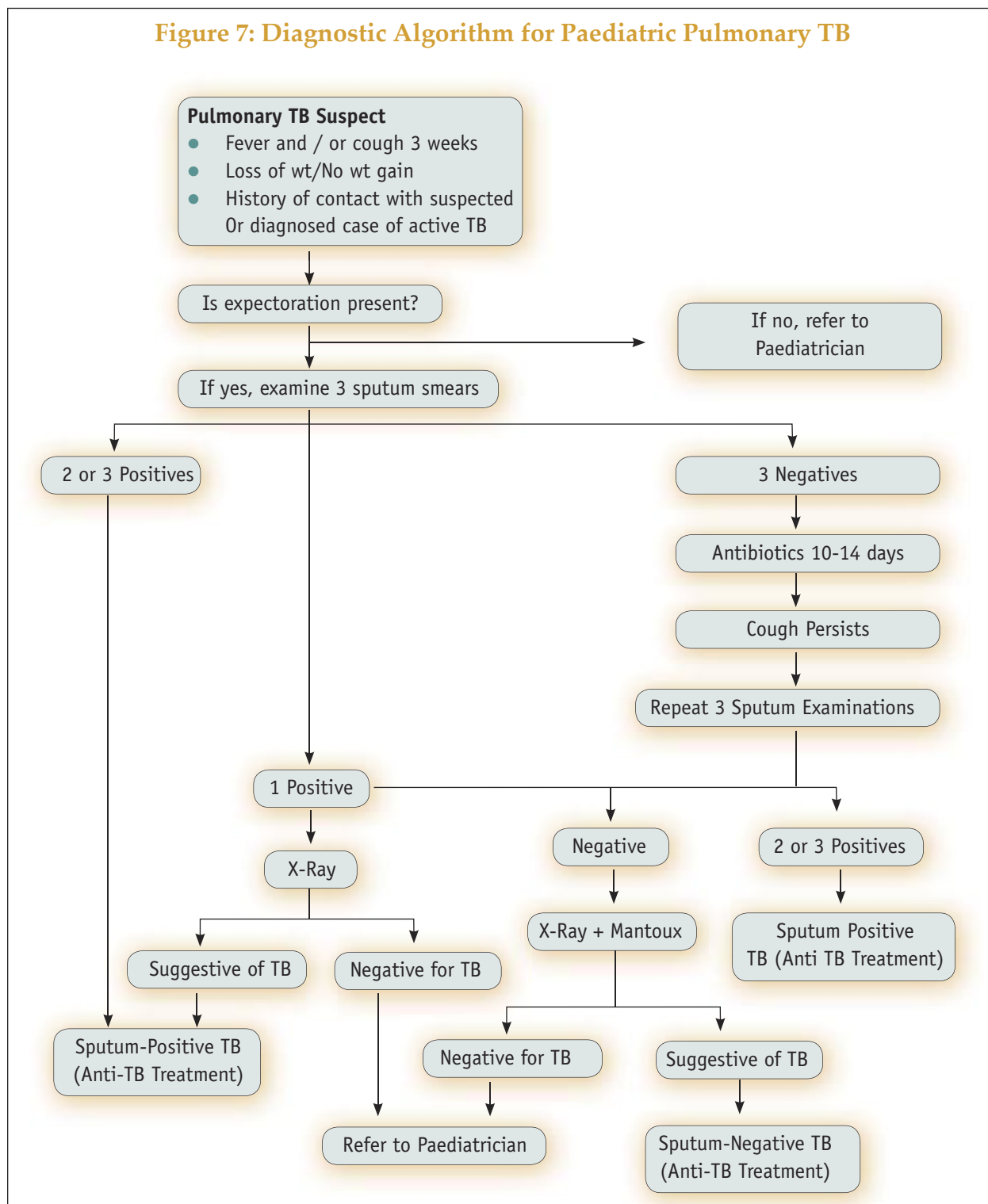
the prevalence of sputum smear-positive pulmonary tuberculosis in the community and the extent of transmission of infection in the community. The management of pulmonary TB is as per the RNTCP diagnostic algorithm for Paediatric TB (Figure 7).

Paediatric patient-wise boxes

To ensure uninterrupted supply of drugs, the programme had introduced patient-wise drug

boxes (PWBs), wherein the complete course (6-8 months) of medicine is earmarked the day the patient is registered for treatment. The drugs are given under direct observation of a DOT provider, who is accessible and acceptable to the patient and accountable to the system. All government health facilities, sub-centres, and community volunteers including anganwadi workers, private practitioners and NGOs have been involved in the provision

Figure 7: Diagnostic Algorithm for Paediatric Pulmonary TB





Paediatric patient-wise boxes

of DOTS. ASHA workers under National Rural Health Mission (NRHM) are also being trained to participate as DOT providers in the villages.

RNTCP, in consultation with the Indian Academy of Paediatrics, has taken steps to make paediatric drugs available in patient-wise boxes (PWBs) similar to those supplied for adult patients under RNTCP. With the availability of paediatric PWBs, all paediatric patients diagnosed and registered for treatment under RNTCP, would be initiated on treatment using the paediatric PWBs. These boxes are designed according to the dosages used for the different weight bands as given in Table 6. All key RNTCP staff in all the states has been trained in the use of these boxes.

TB/HIV Coordination

The burden of HIV infection in India is estimated to be 5.21 million, which equates to approximately 0.9 % of the adult population of the country. The



Paediatric patient being administered DOTS at Institute of Child Health, Chennai. The key RNTCP staff has been trained in the use of these boxes in all the states

HIV epidemic has the potential to worsen the TB situation as HIV increases the risk of disease re-activation in people with latent TB infection. Keeping in mind the urgent need to address the dual epidemic, the Joint TB/HIV Action Plan has been formulated in coordination with the National AIDS Control Programme (NACP) to ensure optimum synergy between the two programmes. The action plan focuses on sensitisation of key policy makers to address the importance of TB/HIV coordination through:

- Coordination of service delivery and cross referrals to ensure optimal access to TB diagnostic and treatment services and HIV testing and counselling services;
- A joint training programme for service providers involved in RNTCP and NACP;
- Voluntary Counselling and Testing Centre (VCTC)-RNTCP coordination;
- Optimal and comprehensive use of the community outreach of both programmes through the sensitisation and involvement of NGOs,

Table 6: Paediatric Dosages and Weight Bands

Drugs	Dosage (mg/kg)	Dosage in mg for weight bands in kg			
		6-10 kg	11-17 kg	18-25 kg	26-30 kg
Isoniazid	10-15	75	150	225	300
Rifampicin	10	75	150	225	300
Pyrazinamide	30-35	250	500	750	1250
Ethambutol	30	200	400	600	1000
Streptomycin	15	-	-	-	-



TB/HIV Coordination review meeting at Chennai, July 2006

community-based organisations and private practitioners involved in both programmes;

- 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 IEC efforts at the national level, monitoring and evaluation system at district, state and national levels to assess the coordination and treatment services for people living with HIV/AIDS.

Phase I of the coordination activities was initiated to cover the HIV high prevalence states, namely Andhra Pradesh, Karnataka, Maharashtra, Manipur, Nagaland and Tamil Nadu. In 2004, Phase II of the coordination saw activities extended to eight additional states, namely Delhi, Gujarat, Himachal Pradesh, Kerala, Orissa, Punjab, Rajasthan and West Bengal. As of December 2006, cross-referral mechanisms have been established between health facilities providing RNTCP services and functional NACP VCTCs in 14 states, including all states classified by NACO as having a high or mid HIV prevalence. In these states, all VCTC clients are questioned by counsellors for the presence of the symptoms of TB disease. Regardless of HIV test results, those clients who have symptoms or signs of TB disease are referred to the nearest facility providing RNTCP diagnostic and treatment services. This is frequently located within the same facility as the VCTC.

The cross referral mechanism between VCTC and RNTCP diagnostic and treatment services was pilot tested first in Maharashtra and is now being implemented in 14 states. All 14 states are now reporting on the cross-referral linkages on the Common List-server (tbhiv@tbcindia.org) which has been created to facilitate regular and simultaneous reporting to both the programmes. A system of regular feedback from centre to state and from state to districts has been established. Coordination Committees have been established at the state and district level, which meet on a quarterly basis to review the implementation of TB/HIV collaborative activities.

Results of TB-HIV collaboration for cross-referral

From January to November 2006, more than 57,000 VCTC clients, suspected of having TB disease, were referred to RNTCP designated microscopy centres for further investigation. During the same period, over 50,000 TB patients, registered under RNTCP, who were suspected of having HIV infection, were referred for HIV counselling and testing (Table 7).

Compared to 2005, the cross-referrals reported up to November 2006 have already exceeded the entire number referred in 2005. In 2005, 23,950 VCTC clients were referred to RNTCP services and 30,389 TB patients were selectively referred for VCT. The

Table 7: VCTC-RNTCP Cross-referrals from 14 states, January–November 2006

Referral of Suspected Tuberculosis Cases from VCTC to RNTCP			
	HIV positive	HIV Negative	Total
VCTC clients referred for TB evaluation	27,525	29,682	57,207
Diagnosed as Tuberculosis Case			
(i) Sputum Positive TB	2,227	4,953	7,230
(ii) Sputum Negative TB	1,475	1,927	3,402
(iii) Extra-Pulmonary TB	461	334	795
Total	4,213	7,214	11,427
Treated by RNTCP (percent of total diagnosed)	2,932 (70%)	5,602 (78%)	8,534 (75%)
Referral of Diagnosed TB Patients from RNTCP To VCTC			
Tuberculosis patients referred to VCTC		51,183	
Tuberculosis patients identified as HIV-infected		7,590 (15%)	

Source: Monthly Cross-referral Report from SACS

increase in referrals from VCTC to RNTCP for TB in 2005 and 2006 is shown in Figure 8.

Challenges in the Cross-Referral Mechanism

There are challenges in the cross-referral mechanism that need to be addressed by both programmes.

First of all, there is a need to build capacity of the staff of these units and optimally involve them in cross-referrals.

Second, the policy of selective referral of clients for VCT needs to be systematically implemented and

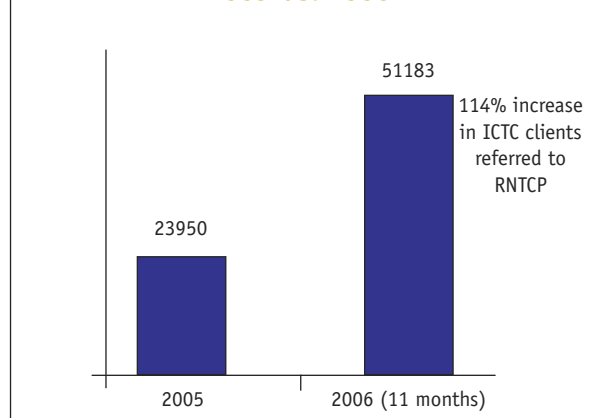
there is a need to provide more focus on intensified case finding in other settings like ART centres and Care and Support (C&S) centres.

Third, there is a significant loss of clients in referrals from ICTCs that needs to be addressed.

Provision of ART to HIV-positive TB patients

ART-DOTS linkages are being established at all the ART centres of the NACP to ensure optimal access to TB diagnostic and treatment services to HIV infected individuals. All the medical officers posted at the ART centres are being trained in RNTCP to facilitate this process. NACO provides free ART at 85 centres in the country, contributing significantly to the growing number of ART centres. Currently two regimens, (zidovudine + lamivudine + nevirapine) and (stavudine + lamivudine + nevirapine), are being provided, although provisions are made for the substitution of efavirenz for nevirapine when concomitant anti-TB therapy is being given. Currently, VCTCs are the primary referral point to ART centres. RNTCP has prioritised collaboration with NACO to develop a mechanism to refer all identified HIV-positive TB patients directly to ART centres for assessment and, if eligible, ART initiation.

**Figure 8: Progress in cross-referral (1)
Number of clients referred from
ICTCs to RNTCP services
2005 vs. 2006**



RNTCP, in collaboration with NACO conducted a periodic HIV survey in TB patients in four HIV high prevalent states in the year 2005-06, which is being scaled up in 2006-07 to 15 districts with low to high prevalence of HIV. The result of this activity is expected to provide valuable information on prevalence and trend of HIV and TB disease co-morbidity, and would inform the development of national and state policies. IEC materials regarding TB are being made available at NACP facilities.

Additional technical support has also been provided to the implementing states for TB/HIV in the form of TB/HIV consultants funded by WHO in the HIV high burden states and TB/HIV coordinators funded through the RNTCP in HIV low burden states. Joint training modules on TB/HIV have been formulated for various categories of staff of RNTCP and NACP.

Standardised IEC material on HIV, prepared by NACP, is displayed in facilities providing RNTCP services. As a new initiative, RNTCP, in coordination with NACP, has developed a “10-point counselling tool” for the VCTC counsellors to facilitate counselling on TB.

Drug Procurement and Logistics Management

Since 2005 the supplies of first line drugs for 500 million population are being acquired through the

Global TB Drug Facility (GDF) utilising financial support of the UK's DFID. Drugs for Haryana are procured by WHO through GDF, utilising USAID support. The procurement of drugs for rest of the population, is being made as per recommendations of World Bank.

The first procurement of second line anti-TB drugs for RNTCP is being made by the central level for 100 MDR-TB patients, who will be initiated on treatment in the states of Gujarat and Maharashtra from early 2007. With the expansion of DOTS-Plus services, the drug procurement for World Bank-funded areas will be made as per World Bank procedures. For the Global Fund to Fight AIDS Tuberculosis and Malaria (GFATM)-funded states, procurement of the second line anti-TB drugs will be made through the Green Light Committee mechanism as required by GFATM.

Drug logistics management

Thirty three State Drug Stores (SDSs) have been established in 26 states. Drugs for the respective districts, based on their Quarterly Reports, are issued to these SDSs for onward distribution to the districts. This has been an important step towards decentralisation of responsibilities for drug logistics to the states. Manuals for state and district levels encompassing the Standard Operating Procedures for drug management have been prepared by the Central TB Division for the states, based on

Table 8: Reserve Drug Stocking Norms and Calculation of Drug Requirement

Level	Stock for Utilisation	Reserve Stock	Drug Requirements
PHI	1 month	1 month	(Monthly consumption x 2) - (existing stock in PHI at the end of month)
TU Drug Store	0 months	2 months	(Quarterly consumption/3) x 4 - (existing stock in TU including PHI drug stores at end of the quarter)
District drug Store	0 months	3 months	(Quarterly consumption/3) x 7 - (existing stock in district including TU & PHI drug stores at end of the quarter)
State Drug Store	0 months	3 months	(Quarterly consumption/3) x 10 - (existing stock in SDS including stocks in the districts drug stores at end of the quarter)

which training to DTOs and pharmacists is being imparted along with functionaries managing the SDS. Eight states have already been re-trained on drug logistics and it is envisaged that all states of the country will be re-trained soon. This is expected to go a long way in strengthening drug management at the state level.

The drugs procured continue to be stored at the six Government Medical Store Depots (GMSDs) located across the country. Drug requirements, consumption and stock positions – both at state and district levels – continue to be 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 (Table 8). For the states which have not established an 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, timely availability to patients after diagnosis is ensured, and are safely dispensed with proper instructions to the patient.

Quality assurance

Maintaining the quality of the drugs is a critical programme requirement. The various measures that have been adopted by RNTCP 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. There is also 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 drug quality control laboratory, which regularly tests samples, taken on a random basis from DTCs, SDSs and GMSDs. A system is also in place for the quality assurance of drugs through random sampling by GMSDs. In addition, samples are also taken by state and Central Drug Inspectors and tested to ensure quality.

Advocacy, Communication and Social Mobilisation

Information, Education and Communication (IEC) is an important component of the RNTCP. The term 'IEC' is used in RNTCP to indicate communication initiatives that include Advocacy, Communication and Social Mobilisation. The term 'IEC' is continued to be used in the programme as it is a familiar word in the field.

The following initiatives were taken during Phase I of RNTCP:

- A country-wide Knowledge, Attitude and Practice study was conducted that provided baseline data and information, and also formed the basis for the advocacy, social mobilisation and communication strategy.
- A communication strategy was developed.
- National and regional workshops were held on planning and implementation of IEC activities.
- Standardised messages and prototypes developed for use at the state, district and sub-district level.
- Printed materials (posters and leaflets), flip charts and promotional materials such as T-shirts, badges, and caps were produced.
- Web-based IEC resource centre developed.
- Radio and TV spots were developed, and shared with the states.
- Media workshops were organised in a few selected big states for media advocacy and for their active involvement in the programme.
- Prototype print material developed in the form of a kit for involvement of the private sector in RNTCP.
- Two national level trainings of IEC Officers have been organised.

Phase II of RNTCP aims to widen the scope for providing standardised, good quality treatment and diagnostic services to TB patients in a patient-friendly environment, in whichever health care facility they seek treatment from. The RNTCP II also envisaged providing improved access to the marginalised groups such as urban slum dwellers, tribal groups, etc.

IEC Activities in States / Districts



IEC strategy

The IEC Strategy clearly identifies target audiences in order to plan and implement different interventions focusing on the behaviour that needs to be modified to achieve the objectives of the programme.

1. IEC is a long-term commitment for RNTCP. Systematic planning and implementation is envisaged in IEC strategy based on the knowledge and understanding of the issues, target audiences, communication tools, and mechanism for monitoring of activities
2. Detailed planning, choice of communication channels and monitoring is decentralised to ensure contextual relevance and wide reach of information.
3. The states and districts to develop state and district-specific communication plans, and use local adaptation and innovation to reach all target groups with the most appropriate communication tools.

4. A reporting format has been introduced to report on IEC activities undertaken at the district and state level against the planned activities as indicated in the annual action plans.
5. Staffing at the national and sub-district level has been enhanced. The Centre has a multidisciplinary communication team – the ‘Advocacy and IEC Unit’ supported by an ‘IEC Advisory Group’. The IEC Unit at the national level draws support and expertise from Centres of excellence in communication, social research, interpersonal communication and social mobilisation.

Additional support has been provided at the district level in the form of ‘Communication facilitators’. A communication facilitator could be an agency, NGO or an individual who would help the districts in planning and implementing IEC activities. Provision has been made for one Communication Facilitator per 5–6 districts.

IEC Activities in Various States

Chennai: On the occasion of World TB Day, various IEC activities were carried out to spread the message of DOTS. A sensitisation programme was held for Anganwadi workers. The programme encouraged about 1,200 Anganwadi workers to extend their full cooperation in RNTCP. A CME programme was held to highlight the recent changes and updating knowledge in the RNTCP.

Kerala: A 'Padayatra' (journey by foot) was organised by the RNTCP staff and other health staff in the coastal areas of Kasaragode district, Kerala in April 2006. This innovative method of IEC activities was used by a team of motivated staff to create awareness among villagers, mostly fishermen and

farmers, about TB and free treatment made available to the patients by the government. The participants of padayatra held placards in their hands and shouted slogans about symptoms of TB and the free treatment available with the beating of drums to attract the attention of curious villagers.

Manipur: The Manipur State TB Officer conducted field visits and participated in interaction between village leaders, voluntary and social organisations such as Meirapaibis, Anganwadi workers, helpers and youth clubs. During the field visit, photo documentation was held in Imphal West for a series of meetings between DOT providers and patients.



Quiz for TB Awareness

In West Bengal's Krishnanagar, Nabadwip and Nakashipara districts, a unique approach has been identified to spread the message of RNTCP. The district TB officers have turned into game show hosts. Seeing the popularity of quiz shows on television, similar shows on TB are being organised in front of a live audience. A cured patient plays a quizmaster for the show in which patients,

both old and new, participate and villagers sit in the audience. Crockery is distributed as prize for being able to answer questions on TB's dos and don'ts, treatment, its side effects, symptoms, medicines and myths associated with TB. The show has received an overwhelming response, with the number of patients reporting to hospitals for treatment being doubled.

6. Special communication initiatives are envisaged to address the needs of the special groups and 'hard to reach populations', such as tribal populations, marginalised populations in urban slums, and other marginalised and vulnerable sections of the community.
7. IEC strategy also envisages active involvement of community-based organisations, NGOs, traditional healers, private practitioners, AWWs, CHWs, cured patients, tribal youth and other community-based volunteers in IEC activities and provision of DOT.
8. The strategy encourages development of locally relevant IEC messages and patient education material using local vocabulary.
9. Linking RNTCP-IEC activities with the social mobilisation campaigns conducted by other disease control programmes is another important aspect of the communication initiatives envisaged in RNTCP II.

State and district action plans

States and districts develop IEC action plans as part of the annual state and district action plans. The state IEC Action Plans are developed by the states keeping in mind the activities required for advocacy, reproduction of material for use by the districts, organisation of interaction meetings with the professional and legislative groups and other need based communication activities. The state Action Plans are reviewed at the national level and feedback and observations are sent to the states. The states and districts implement their activities as per the action plan. Every quarter, a report on the IEC activities is sent by the districts to the state and by the state to the centre in the reporting format developed for the purpose.

New Areas

Drugs resistance surveillance

The prevalence of anti-TB drug resistance in the community can be taken as an indicator of the effectiveness of TB control activities in the

community over a period of time. RNTCP has taken steps to measure this important indicator across the country. For determining the prevalence of anti-TB drug resistance among new and previously treated patients, state-wide Drug Resistance Surveillance (DRS) surveys are being conducted in the states of Andhra Pradesh, Gujarat, Maharashtra, Orissa, and Uttar Pradesh. A second round of DRS surveys will be carried out in the same states, using the same methodology, after a period of five years.

The DRS surveys of Gujarat and Maharashtra have been completed in 2006, and the survey in Andhra Pradesh is ongoing. The interim report of DRS survey, Gujarat showed that the percentage of MDR-TB cases amongst new cases is 2.4% and amongst re-treatment cases is 17%. The intake of cases under DRS in Maharashtra was completed in the month of November and the results are being analysed. The DRS surveys of Orissa and Uttar Pradesh will be starting in 2007-08.

RNTCP DOTS-Plus

The emergence of multi-drug resistant TB (MDR-TB), which is defined as resistance to at least isoniazid and rifampicin, has become a significant public health problem in a number of countries and an obstacle to effective TB control. In India, the exact prevalence of MDR-TB is not known at present. However, available information suggests that the prevalence of MDR-TB is relatively low in India. Nonetheless, this translates into a large absolute number of cases and the country is as yet not fully equipped to manage MDR-TB patients. Specific measures are now being taken within the RNTCP to address this problem through appropriate management of MDR-TB patients, and enhancement of the existing strategies to prevent the propagation and dissemination of MDR-TB.

RNTCP reaffirms that the prevention of MDR-TB is the priority task and that this can be achieved only through the implementation of a good quality

DOTS programme. Traditionally, DOTS-Plus refers to DOTS programmes that add components for MDR-TB diagnosis, management and treatment. The DOTS-Plus strategy promotes full integration of DOTS and DOTS-Plus activities under the RNTCP, so that patients with MDR-TB are both correctly identified and properly managed.

The DOTS-Plus framework is organised around the same five components of the DOTS strategy, as the underlying principles are the same. The core components are comprehensive, ensuring that all essential elements of the DOTS-Plus strategy are included, and are:

- Sustained government commitment;
- Accurate, timely diagnosis through quality assured culture and drug susceptibility testing (DST);
- Appropriate treatment utilising second-line drugs under strict supervision;
- Uninterrupted supply of quality assured anti-TB drugs; and
- Standardised recording and reporting system.

Sustained political and administrative commitment

Sustained political and administrative commitment is essential to establish and maintain the other four components. It requires both long-term investment and leadership in ensuring an appropriate environment for integrating the management of MDR-TB into the basic RNTCP activities. An appropriate DOTS-Plus environment includes adequate infrastructure, development and retention of human resources, inter-agency cooperation, TB control policies enabling rational DOTS-Plus implementation, and facilitation of the procurement of quality-assured second-line anti-TB drugs. In addition, the existing RNTCP activities must be strengthened to prevent the emergence of more MDR-TB cases.



State TB Officer briefing the Health Commissioner, Gujarat on the important points of RNTCP

Diagnosis of drug-resistant TB through quality assured, timely culture and drug sensitivity testing

Accurate and timely diagnosis is the backbone of the DOTS-Plus activities. MDR-TB must be diagnosed correctly before commencement of treatment. Quality assured culture and DST is thus indispensable. Non-viable cultures, culture contamination, and unreliable DST results have major consequences for both individual patients and the TB control programme as a whole. Therefore, internal quality control and external quality assurance should be in place, including a link for proficiency testing with a recognised reference laboratory such as one of the RNTCP National Reference laboratories.

Appropriate treatment strategies utilising second-line anti-TB drugs under appropriate management conditions

RNTCP will be using a standardised second-line drug regimen for treating MDR-TB cases. The choice between hospitalisation and ambulatory treatment depends on several factors in addition to the severity of the disease. Such factors include: the

availability of hospital beds; the availability of trained personnel at hospitals and clinics to administer treatment and manage adverse drug reactions; the availability of a DOT and social support network to facilitate adherence to ambulatory treatment; and the presence of other clinical or social conditions in patients.

Uninterrupted supply of quality-assured second-line drugs

Management of treatment with second-line anti-TB drugs is complex. Most second-line drugs have a short shelf life, global production of quality-assured drugs is limited, and drug registration may be a lengthy and costly process that is not always attractive to drug manufacturers. In addition, drugs may need to be changed due to side effects, delayed DST results, and poor response to treatment. To ensure uninterrupted drug supply, procurement must begin well in advance of the anticipated need, and projected drug needs must be estimated as accurately as possible.

A recording and reporting system designed for DOTS-Plus

The specific characteristics of a DOTS-Plus programme require a recording system, culture and DST results, and monitoring treatment delivery and treatment response for 24 months. Cohort analysis in DOTS-Plus includes interim indicators and treatment outcomes after 2 or more years. The developed recording and reporting system is essential for evaluating programme performance and treatment effectiveness.

Management of MDR-TB under RNTCP

Based on the above components, RNTCP aims to address the issue of diagnosis and treatment of MDR-TB patients. It needs to be recognised that the diagnosis of MDR-TB is not clinical but

laboratory based. RNTCP therefore aims to establish a network of accredited, quality assured Intermediate Reference Laboratories (IRLs) for providing culture and anti-tubercular DST services. It is planned to have at least one accredited IRL in each of the large states by 2009-10. The strengthening of the state level IRLs is underway and the laboratories at Andhra Pradesh, Gujarat, and Maharashtra are in the process of being accredited.

Category II patients, who remain sputum positive even after 4 months of supervised treatment will be identified as MDR-TB suspects and referred for diagnosis by culture and DST done at an RNTCP accredited IRL. On being diagnosed as an MDR-TB case, the patient will be referred to a designated state level DOTS-Plus site. 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 DST laboratory. The DOTS-Plus site will be supported by qualified staff available to manage patients using the standardised second-line Category IV drug regimen given under daily DOT and standardised follow-up protocols. There will be mechanisms to deliver ambulatory DOT after an initial short period of up to one month of in-patient care to stabilise the patient on the second-line drug regimen, and a logistics and standardised information system will be in place. The DOTS-Plus sites will be established 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 established RNTCP accredited IRLs. The DOTS-Plus sites have been established in Gujarat and Maharashtra and the registration of MDR-TB cases at these sites will commence in the first quarter of 2007.

RNTCP will be using a standardised Category IV treatment regimen comprising six drugs – Kanamycin, Ofloxacin, Cycloserine, Ethionamide, Ethambutol

and Pyrazinamide – during the intensive phase of 6 to 9 months, followed by four drugs – Ofloxacin, Cycloserine, Ethionamide and Ethambutol – during the continuation phase for 18 months. All drugs are to be administered daily under direct observation by a trained DOT provider. During treatment, there

will be a regular follow-up of progress by smear and culture examination as per the protocol based on the international guidelines. To ensure that the patient completes the long and arduous treatment, the programme will provide enablers for their visits to the DOTS-Plus site for follow-up.

JOINT MONITORING MISSION

Chapter 4

“They said it could not be done; it is now the largest achievement in the world in TB control. If RNTCP is maintained, it will reduce tuberculosis in India, saving millions of lives and the suffering of future generations.”

Dr Fabio Luelmo, Senior Mission Member

India has the distinction of implementing the largest TB control programme in the world, which provides treatment for over 100,000 newly registered patients every month, with a treatment success rate of over 85%. The RNTCP, based on the internationally recommended DOTS strategy, has been expanded in a phased manner from 1997. Since the programme began, the RNTCP has trained over half a million staff in the health system, evaluated more than 24 million people with suspected TB, examined more than 100 million sputum slides and treated nearly 6.7 million patients, saving almost 1.2 million

additional lives. Life-saving TB services are now reaching millions of patients in India, free of cost.

As part of the country’s commitment to maintain high standards of diagnosis and treatment, the Government of India invited an international panel of experts from the fields of public health, TB research and treatment, medical education and other related sectors, to visit the country and participate in the 2006 Joint Monitoring Mission (JMM). The international experts were from the World Health Organization (WHO), Stop-TB Partnership, World



Dr. Fabio Luelmo, WHO TB expert, addressing the Joint Monitoring Mission, October 2006

Bank, Global Fund to fight AIDS, TB and Malaria (GFATM), the UK's Department for International Development (DFID), United States Agency for International Development (USAID), Royal Netherlands Tuberculosis Association (KNCV), Centres for Disease Control and Prevention (CDC), International Union Against Tuberculosis and Lung Diseases (IUATLD), and other leading TB experts. National experts were mainly from medical colleges, Indian Medical Association, NGOs and TB experts from states. The GoI/WHO RNTCP JMM 2006 was organised from the 3rd Oct to 17th Oct 2006. This is the third such mission to review the RNTCP, the last such review being conducted in 2003.

The JMM was conducted with the following objectives:

- To review the performance of RNTCP taking as a base the JMM review carried out in 2003.
- To review technical policies, especially of the more recent or newer activities, in the second phase of the RNTCP (e.g. EQA of sputum microscopy, prevalence surveys, drug resistance surveillance, DOTS-Plus, etc).
- To formulate recommendations on the above two objectives so as to move towards achieving the TB related MDGs by 2015 and eventually achieve TB control in India.

- To assess the sustainability of the activities under RNTCP in order to achieve the desired epidemiological impact for TB control.

Members of the JMM visited 20 randomly selected districts in six states — Gujarat, Haryana, Karnataka, Madhya Pradesh, Punjab and West Bengal. Over 40 TB Units and 80 Designated Microscopy Centres were scrutinised to review the diagnostic and treatment services in the field. Nearly 100 randomly selected patients were interviewed to assess the quality of DOTS. The teams also interacted with national, state and district level authorities, extensively reviewed patient records, and interviewed programme staff.

The mission made the following key observations and recommendations:

- The Indian TB Control programme has successfully completed the largest and most rapid expansion of DOTS in history to cover the entire country.
- Quality-assured microscopy and drugs have been provided free of cost to patients. About 12,000 microscopy centres have been established across the country, and hundreds of thousands of health workers and community volunteers have joined the programme to support patients through treatment.



Dr. L. S. Chauhan, DDG (TB), briefing the JMM team, October 2006



JMM team reviewing records at a health centre



JMM team in village Sausera, district Vidisha, Madhya Pradesh

- The Mission stated that the programme is very effective, including the microscopy services for diagnosis, reliable supplies of good quality drugs, and a transparent and powerful reporting system, which is a model for other health programmes. The rapid expansion of services and the scale of activities have, however, stretched the capacity of the health system. The Mission therefore recommended steps to strengthen the core capacity for programme implementation at central and state levels.
- The Government of India's National Rural Health Mission (NRHM), which has been launched to strengthen the general health system, offers an opportunity provided that the key elements of the TB control programme are protected and sustained. The Mission urged the national government to ensure that anti-tuberculosis drug procurement, core full-time RNTCP staff, TB specific reporting and financing are continued under the NRHM, and ensure maximum use of the new staff available. It also stated that the programme should support the National Rural Health Mission to identify and address weaknesses in the health system, including lack of laboratory technicians and vacancy or frequent transfers. The NRHM, through its cadres could also improve access and convenience of services at community level.
- Improve programme effectiveness by concerted efforts to improve case detection, provide wider decentralised DOT provision, further decrease default rates and simplification of the recording and reporting systems. Suggestions made to increase case detection included improving the training of general medical officers and paramedical staff, and implementing interventions such as systematic screening for cough by non-medical and paramedical staff, retrieving initial defaulters and using community workers more to increase referral and community awareness. Use of strategies to improve effective communication in the community, in particular to expand awareness of the location of free microscopy and free tuberculosis care were also recommended.
- To address MDR-TB, the Mission recommended expediting the establishment of laboratories for quality-assured culture and drug-susceptibility testing, and implementation of the national plan and guidelines for MDR-TB. The Mission recommended that all providers, including those in medical colleges and TB hospitals, should adhere to the national guidelines for MDR-TB.
- For scaling up collaborative activities with the national HIV programme, the Mission recommended the setting up of a national level technical working group and greater coordination to ensure referrals of patients with a focus on the areas with the highest TB/HIV burden.



Press conference following JMM de-briefing

- Recognising that combating TB is a long-term battle, the Mission urged that the Government of India continues to give the highest priority to TB and TB control activities and to partner with external technical and financial partners to ensure long-term sustainability of the programme.

The Mission observed that if the RNTCP continues its current impetus and effectively undertakes the necessary additional interventions, India should achieve the TB targets set under the UN Millennium Development Goals.

The successful performance of RNTCP throughout the country is a remarkable example of administrative and political commitment towards TB control. The RNTCP strategy to engage all frontline TB care providers like medical practitioners, laboratory technicians and STLS/STS has ensured the decentralisation of the Programme. Empowering people with TB is another step towards community participation in TB care.

The Programme is proud of its large contingent of NGO workers, members of self-help groups and cured patients, who work with extraordinary commitment and dedication to make DOTS services available and accessible even in the most remote corners of India. These are ordinary people who are in a position to take charge of their own lives, communities and resources. Their remarkable effort to take such initiatives at the grassroots level has been the backbone of the success of the Programme. Each state and district has such success stories to share. Some of the stories are presented below.

Laundry turns to make-shift DOT centre

Shambhu Yadav, a resident of a backward settlement, Nandai Mohalla of Rajnandgaon had tested sputum positive for TB. He was undergoing DOTS treatment, but was unable to visit the District TB Centre regularly to take his medicine. This initially resulted in missing doses. The health worker motivated him to visit the DOT centre regularly. Shambhu explained to the health worker about his problem and enquired about making provision of DOT nearby his residence.

The doctors decided to search for a more suitable DOT provider in the local vicinity. Shyam Lal Rajak, a laundryman (dhobi) living in that poor and backward settlement, happily agreed to become DOT provider for Shambhu Yadav. Shyam Lal was trained on TB symptoms, its treatment and DOTS. After completing the training, he started the DOTS regimen for Yadav with a keen sense of dedication.



Shambhu Yadav has now recovered considerably, though his treatment is still going on. On the other hand, Shyam Lal Rajak has gained confidence and has expressed desire to provide DOTS treatment to other patients in his locality.

DOTS relief to couple

Sitabai Nada of Jodhpur Ward (Dhamtari District) had become very weak with prolonged fever and cough. Her body weight dropped to a sickly 30 kg. She was unable to afford proper treatment due to financial problems.

On visiting the district TB centre in Dhamtari, she was found to be suffering from TB after a sputum test. The doctor advised that her husband should also get his sputum test done. After three samples of sputum test, it was found that both husband and wife had TB.

“I was told that I will have to take the medicines through DOTS method and I will be cured,” says Sitabai. The couple completed six months course of medicines and have fully recovered to lead again a healthy life. Sitabai has since become an activist and has already sent nine TB suspects to the DTC. Three of these were found positive and are availing DOTS treatment.



According to Sitabai, “My weight has increased from 30 kg to 42 kg. Now I have recovered my strength and I am able to do household work. It is due to DOTS that I can now get back to my incense sticks (agarbatti) work to get some extra income. I feel that it is my duty to inform other suspect TB patients about DOTS.”

Mega conference held at IMA to promote DOTS



It was a great opportunity for the team of RNTCP to simultaneously interact with about 2000 private practitioners at the 58th Gujarat State Annual Conference GIMACON 2006 held by the Surat chapter of the IMA. The conference promoted modern medical services, which includes DOTS. Lectures were given on DOTS and TB-HIV coordination among others. The attractive IEC stall of RNTCP displayed the key message given by CTO, “together we can make a difference, and there is nothing that looks impossible”.

At the outset the NSP case detection rate of 70% has been achieved. Total case detection rates have also improved. Quality of the RNTCP services in the area has enhanced since the TU started functioning in 2005. Most of that credit goes to Dr Das.

DOTS transforms family

Thirteen-year-old Tirsi studies in Class six at Kharswan district in Jharkhand. A bright student, Tirsi is loved and cared for by her teachers and classmates. But a sudden drastic change appeared in their attitude since she started coughing non-stop. Her friends who earlier played together with her, got annoyed with her wheezing and started avoiding her.

Her father Boka – a low-wage worker – was unable to afford her treatment and sought help. Friends informed him about the DMC at Seraikella, where the sputum examination and full course of drugs is provided free of cost. After a thorough examination, Tirsi tested sputum positive for TB and was immediately put on DOTS. Boka was given details of the DOTS centres where treatment is provided free of cost and is given under the observation of DOT provider. Gradually after taking her drugs thrice a week for two months, her cough and other symptoms subsided and her body weight improved.

After six months of treatment, Tirsi has been declared free of TB. She has since rejoined her class and is welcomed by her teachers and classmates. Boka feels obliged to the DOTS services and goes around town spreading the message of DOTS. He has become an IEC member of Jharkhand’s RNTCP and refers lots of patients for sputum examination

DOT centre opened at Military Hospital

The Military Hospital at Namkum, Jharkhand, has 525 beds exclusively for in-patient treatment of tubercular and non-tubercular respiratory diseases. As per the existing policy, all officers and other ranks suffering from pulmonary tuberculosis, are given supervisory treatment as in-patients. This ensures good drug compliance and regular monitoring, resulting in a cure rate of more than 95%. On the other hand, families of officers and other ranks, and ex-servicemen were being treated as outdoor patients. Their treatment was unsupervised and led to poor drug compliance, decreased cure rate and increased likelihood of relapse and resultant multi drug resistant patients.



The hospital soon adopted the RNTCP guidelines and opened a DOTS Centre in January 2007. Commenting at the inauguration, Brig P. Krishnamurthi, Commandant Military Hospital Namkum, said that this being the first hospital in the armed forces to start DOTS, could serve as a role model for other service hospitals too. Col MS Barthwal, Chest Physician and officer incharge DOTS programme said that with this introduction of the DOTS programme, the cure rate of tuberculosis in families and ex-servicemen is likely to improve appreciably.

JHARKHAND
NAMKOM

Doctor-speak on DOTS

Dr C. Ravindran is a professor at the Department of TB and Chest Diseases Medical College, Calicut. Here is his personal account of his perception of RNTCP.

“Initially, I had reservations about the programme, especially after the dismal outcome of the NTP (*the earlier TB control programme in India*). But watching the programme closely, I felt that the organisational structure is strong and the programme managers are committed. Moreover, the flexibility to adapt when faced with challenges was amazing and it really prompted me to work for the programme. I thought that the best way to criticise is not from outside but when within it.

During my tenure as the Head of department from 2002 to 2006, I had the good opportunity to work in tandem with DTC of Kozhikode and establish a well-functioning RNTCP unit in Calicut Medical College. I understand that this is the best performing Medical College Unit in the state. We could sensitise almost all faculties and most of the residents and students of this college. We are also working with organisations like IMA, Calicut Forum for Internal Medicine, and Calicut Chest Club for promoting RNTCP. One interesting observation is that in 2006 we had only one admission with MDR-TB, truly reflecting the effort to improve treatment compliance.”

KERALA
CALICUT

Persistent Collector fights TB

Indore, the commercial capital of Madhya Pradesh, with big and diverse health care facilities, had a low new smear positive case detection rate until 4th quarter 2005. The credit for the remarkable improvement in programme performance after second quarter of 2006 onwards, goes to the district collector for giving special attention to the TB cases.

The district collector, Shri Vivek Aggarwal, identified poor supervision as the most important factor for the low case detection. Following this, the collector started reviewing the programme regularly. He regularly chaired the quarterly RNTCP district review meetings. The additional collector, Ms. Renu Pant, who was given charge of RNTCP, conducted field visits along with the DTO, especially to areas with suboptimal performance. These efforts by the district collector showed results from the first quarter 2006 itself and the case detection started increasing, which is evident in the programme performance reports.

MADHYA PRADESH
INDORE

Doctors trained in PPM Module

Nehru Shatabdi Chikitsalay, Jayant is a multi-specialty hospital of Northern Coalfields Ltd., in Sidhi district of Madhya Pradesh. Last year, about 43 doctors were trained with the RNTCP PPM module under the guidance of the State TB Officer. In addition, four doctors of Nehru Shatabdi Chikitsalay were given a five-day modular training workshop at the Regional Health and Family Welfare Training Centre, Jabalpur.

The Nehru Shatabdi Chikitsalay has examined about 577 TB suspects since it was designated as microscopy centre, of which 57 have been found positive for AFB. The hospital has put 94 TB patients on DOTS in about 10 months. This is a big achievement for a district with only 57 doctors.

DOTS quiz for doctors



It has been often felt that many general practitioners, who get first hand contact of tuberculosis cases, are not aware of RNTCP and DOTS due to which they are not able to provide quality care to the patients. To combat this complacency, the Pimpri Chinchwad Municipal Corporation (PCMC) came up with the idea of hosting a quiz show for doctors. The aim of this DOTS quiz was to sensitise all the general practitioners of Pimpri Chinchwad on the RNTCP.

The quiz questions ranged from epidemiology of tuberculosis to aspects of RNTCP. The PCMC area was divided into six different zones. The winning team from each zone was selected to compete at the zonal level. A certificate, memento and a grand prize of Rs. 2500/- was given to the winner.

One man's mission to control TB

This is a story of a watchman who really 'watches' over his TB patients. With his supported supervision and the bond he develops with patients, there have been no default cases so far. Watchman Bahdeng Sunn of Mawngap, East Khasi Hills doubles as a committed and sincere DOT provider. He maintains high quality DOTS service and promptly retrieves their treatment. He visits the patients door to door and also counsels the alcoholics.

The state/district supervisors were pleased to hear Bahdeng Sunn proudly declare the steadily rising number of his cured patients. He often insisted that the DTO personally visit the patients for verification. He also remains in close contact with the MO in charge and reports the matter to him when there are any complications with the patients under him.

Bahdeng Sunn is one of the community volunteers who is passionate about seeing the entire Meghalaya one day free of TB. The RNTCP staff hopes that the district will have more like him in order to attain the goal and objective of the programme.

Lions in DOTS treatment



Ten Lions Club International of Moga, Punjab have taken the lead in participating in RNTCP. More than 110 Lions' members were sensitised in a workshop held in November 2006. Presentations were given on RNTCP and TB-HIV coordination. The workshop successfully created awareness among members about the current status of the scourge of TB worldwide and the role that NGOs can play in RNTCP. The members reported that after the workshop they have started advocating RNTCP in their areas and have volunteered to become DOT providers. They are making sincere efforts to establish flexi-DOT centres in their areas.

PUNJAB
MOGA

Community Empowerment - Story of a woman from an NGO-'SWACCH'

RAJASTHAN
UDAIPUR

Chander Meghwal is a 21-year old Dalit woman living in Danteradi village of Salumbar block in Udaipur District, Rajasthan. Almost all inhabitants of this village belong to Scheduled tribes. She has taken the initiative of changing her own life and those of others for the better. She is going to appear for BA final exam even after getting married and having a baby. She has recently joined SWACCH, an NGO working in 6 tribal TUs of Udaipur as one of its over 300 volunteers. Now her home is the DOT Centre for her village. Her accessibility and bonding with the TB patients coming to the DOT Centre supports them during their treatment, and the honorarium she will receive will give her financial freedom.



RNTCP DOT PROVIDERS



DOTS in Railway health facility



Unani healer as DOT provider in Jaipur



A prisoner, also a DOT provider for TB patients within Central Jail, Rewa district, Bhopal



A patient receiving DOTS at Hirabaug Health Centre, Surat, Gujarat

DOT provider wins election

Rafatullah Khan started a DOT centre at his residence in the criss-crossing by-lanes of Kashmiri Bazaar, Agra. "Khan Sahib", as he is popularly known, got involved with full dedication in the programme. Patients who could not afford the full course of the expensive medication turned to him. Soon, patients started pouring in by the dozen at his DOT centre and he had to request the CMO and Agra DM to use the Municipality primary school in the area as a makeshift DOT centre in the evenings to keep up with the inflow of patients.



Since the implementation of RNTCP in Agra districts in the second quarter of 2003, he has provided DOTS to 142 patients and presently 43 patients are on DOTS at his centre. His commitment knows no bounds and one can see him regularly at the district TB Centre, which he frequents to keep himself updated on the Programme. Leadership comes naturally to Rafatullah. He gathers all the patients who complain of complications and personally takes them to the district TB Centre for an expert medical opinion.

It was not surprising that the local public encouraged him to contest the election for Municipality ward member. With the support of his patients and the community, he won the election convincingly in November 2006. "DOTS service provided by me has been the reason for my success in the elections. I would remain ever committed to providing DOTS services to the community," remarked an elated Rafatullah. The District TB Control Society, which has chosen him as the best DOT provider twice, seems to agree.

UTTAR PRADESH
AGRA

Hospital leads fight against TB

K.B. Patel Charitable Trust Hospital gives subsidised services to patients including clinical, pathological and radiological investigations. It has joined hands with the government after seeing the achievements of RNTCP. After being convinced about the policies, objectives and operational modalities of RNTCP, the hospital administration started providing services to TB patients at a no profit-no loss basis.

The doctors and paramedical staff of K.B. Patel Charitable Trust Hospital were trained in RNTCP after the implementation of the programme in district Agra in June 2003. The NGO hospital now works as a Designated Microscopy cum Treatment Centre (NGO Scheme-4) in the TB Unit of Agra North with full dedication to the TB services it provides. Its trustees, administration, doctors and technicians have been very considerate and caring to the patients, and their performance is on a steady rise.



UTTAR PRADESH
DAYALBAGH, AGRA

“Designing and conducting locally relevant operational research can help in identifying problems and workable solutions, testing them in the field and planning for the scaling up of activities.”

The Stop TB strategy, WHO 2006

The RNTCP vision is to widely communicate its research agenda and application process, encourage more people to undertake research on RNTCP and streamline the research proposal, approval and funding process.

Studies approved by the Central Operational Research (OR) committee in May 2006:

- TB Prevalence survey in Wardha district (MGIMS, Wardha)
- TB prevalence survey in Neelmangla Taluk, Rural Bangalore district (NTI, Bangalore)
- Evaluation of the efficacy of thrice weekly DOTS regimen in TB pleural effusion at six months (AIIMS, New Delhi)
- A study on the assessment of RNTCP strategy of FNAC diagnosis at two weeks and six months duration of treatment for peripheral TB Lymphadenitis (PGIMER, Chandigarh)
- Utility of generic and disease specific health related quality of life instruments as outcome measures for TB patients treated under RNTCP at Chandigarh (PGIMER, Chandigarh)
- A survey on prevalence and patterns of anti TB drug resistance in Banda district (JALMA, Agra)

ANNUAL RISK OF TUBERCULOUS INFECTION IN INDIA

The Annual Risk of Tuberculous Infection (ARTI)¹ was selected as the epidemiological parameter to obtain the most reliable index of TB situation in the country. The first nation-wide ARTI survey was conducted during 2000-03. The country was stratified into 4 zones and the study was designed to estimate average annual risk of tuberculosis infection in each of the zones. The zonal estimates were pooled to estimate the national level ARTI, which was 1.5%. The programme plans to repeat National ARTI every 5-6 years, with the next round planned for 2007-09. State-specific ARTI studies have also been undertaken in Andhra Pradesh, Kerala and Orissa.

DISEASE PREVALENCE SURVEY

A large-scale national disease prevalence survey is ideal to get a direct estimate of the TB prevalence. However, in a vast country like India this is not feasible due to the operational and technical constraints. To obtain a more representative estimate and study the trend in prevalence, the programme plans to undertake TB disease prevalence surveys in 6 select sentinel sites/districts in different zones

¹ ARTI indicates the probability of a person acquiring new infection or re-infection with tubercle bacilli during the course of one year. It reflects the overall impact of various factors influencing transmission of the tubercle bacilli such as the load of infectious cases in the community and the efficiency of public health measures to control TB.

of the country. Institutes of repute which include NTI (Bangalore), MGIMS (Wardha), AIIMS (New Delhi), PGIMER (Chandigarh), JALMA (Agra) and RMRCT (Jabalpur) will be undertaking the survey. The surveys will be undertaken in 2007-10 and would be repeated every five years to evaluate progress towards the TB-related Millennium Development Goals.

Select Abstracts

Active community surveillance of the impact of different tuberculosis control measures, Tiruvallur, South India, 1968–2001. *International Journal of Epidemiology*, Advance Access published September 22, 2006

Subramani R, Santha T, Frieden T R, Radhakrishna S, Gopi P G, Selvakumar N, Sadacharam K, and Narayanan P R

BACKGROUND: Tuberculosis is curable, but community surveys documenting epidemiological impact of the WHO-recommended DOTS strategy on tuberculosis prevalence have not been published. We used active community surveillance to compare the impact of DOTS with earlier programmes. **METHODS:** Tuberculosis disease surveys was conducted using random cluster sampling of a rural population in South India approximately every 2.5 years from 1968 to 1986, using radiography as a screening tool for sputum examination. In 1999, DOTS was implemented in the area. Prevalence surveys using radiography and symptom screening were conducted at the start of DOTS implementation and after 2.5 years. **RESULT:** From 1968 to 1999, culture-positive and smear-positive tuberculosis declined by 2.3 and 2.5% per annum compared with 11.9 and 5.6% after DOTS implementation. The 2.5 year period of DOTS implementation accounted for one-fourth of the decline in prevalence of culture-positive tuberculosis over 33 years. Multivariate analysis showed that prevalence of culture-positive

tuberculosis decreased substantially (10.0% per annum, 95% CI: 2.8–16.6%) owing to DOTS after only slight declines related to temporal trends. **CONCLUSIONS:** Following DOTS implementation, prevalence of culture-positive tuberculosis decreased rapidly following a gradual decline for the previous 30 years. In the absence of a large HIV epidemic and with relatively low levels of rifampicin resistance, DOTS was associated with rapid reduction of tuberculosis prevalence.

Source of re-treatment cases under the Revised National TB Control Programme in Rajasthan, India, 2003. *Int J Tuberc Lung Dis* 10(12) : 1373–1379, 2006

Sisodia R S, Wares F, Sahu S, Chauhan L S, and Zignol M

BACKGROUND: Three years after state-wide DOTS coverage and achievement of global targets for detection and cure, the proportion of sputum-positive retreatment cases remained high in the north Indian state of Rajasthan. **AIM:** To determine source, accuracy of categorization and treatment outcomes in Category II sputum-positive retreatment cases registered from January to March 2003 in five districts of Rajasthan. **MATERIAL AND METHODS:** Two hundred consecutive Category II sputum-positive retreatment cases were identified from the tuberculosis register and interviewed using a semi-structured questionnaire. **RESULTS:** Categorisation was correct in 195 (97.5%) of retreatment cases interviewed. Treatment after default (TAD) comprised 84.6% (165/195) of interviewees, with 13.3% (n = 26) relapses and 2.1% (n = 4) failure cases. Of the TAD cases, 84.8% (n = 140) had defaulted from previous treatment in the private sector. Only 6.1% (n = 10) had defaulted from Category II DOTS treatment. The most unfavourable treatment outcome seen amongst interviewees was default, as also described in the national data. **CONCLUSION:** TADs constituted the majority of interviewed retreatment cases

(84.6%), and were overwhelmingly being generated by irregular treatment in the private sector. Further involvement of the private sector in the DOTS programme in Rajasthan is needed to stop the creation of further retreatment cases.

Improving tuberculosis control through review public-private collaboration in India: literature, *BMJ* 2006;332;574-578; originally published online 8 Feb 2006

Dewan P K, Lal S S, Knut Lonroth, Wares F, Uplekar M, Sahu S, Granich R, and Chauhan L S

OBJECTIVE: To review the characteristics of public-private mix projects in India and their effect on case notification and treatment outcomes for tuberculosis. **DESIGN:** Literature review. **DATA SOURCES:** Review of surveillance records from Indian tuberculosis programme project, evaluation reports, and medical literature for public-private mix projects in India. **DATA EXTRACTION:** Project characteristics, tuberculosis case notification of new patients with sputum smear results positive for acid fast bacilli, and treatment outcome. **DATA SYNTHESIS:** Of 24 identified public-private mix projects, data were available from 14 (58%), involving private practitioners, corporations, and non-governmental organisations. In all reviewed projects, the public sector tuberculosis programme provided training and supervision of private providers. Among the five projects with available data on historical controls, case notification rates were higher after implementation of a public-private mix project. Among seven projects involving private practitioners, 2796 of 12 147 (23%) new patients positive for acid fast bacilli were attributed to private providers. Corporate based and non-governmental organisations served as the main source for tuberculosis programme services in seven project areas, detecting 9967 new patients positive for acid fast bacilli. In nine of 12 projects with data on treatment outcomes, private providers exceeded the programme target of 85% treatment

success for new patients positive for acid fast bacilli. **CONCLUSIONS:** Public-private mix activities were associated with increased case notification, while maintaining acceptable treatment outcomes. Collaborations between public and private providers of health care hold considerable potential to improve tuberculosis control in India.

Involvement of private practitioners in tuberculosis control in Ballabgarh, Northern India. *Int J Tuberc Lung Dis*, 2006, 10(3):264–269

Krishnan A, Kapoor S K

OBJECTIVE: To test the feasibility of involving private practitioners (PPs) in the RNTCP for identification and management of TB cases.

DESIGN: PPs in Ballabgarh Block, Haryana, were identified and invited for training in RNTCP guidelines. They referred TB suspects for confirmation of diagnosis to a nearby public facility. Patients could subsequently choose to return to their referring doctor or to the government facility. Patients and doctors were interviewed at the end of the project to assess their perceptions. **RESULTS:** Of 146 PPs, 72% were trained in RNTCP guidelines and 14 agreed to provide directly observed treatment (DOT). During the study period (May 2001– December 2003) 113 patients initiated treatment, leading to an incremental gain of 11.5% in case finding. The cure rate among the 113 sputum positive patients was 73%, and the default rate was 11.5%. **CONCLUSION:** Involvement of private practitioners in TB control is possible and results in benefits for all stakeholders.

International Standards for Tuberculosis Care. *Lancet Infect Dis* 2006; 6: 710–25

Hopewell P, Pai M, Maher D, Uplekar M, and Raviglione M.

While healthcare providers who are part of national tuberculosis programmes have been trained and are expected to have adopted proper diagnosis,

treatment, and public-health practices, the same is not likely to be true for non programme providers. Studies of the performance of the private sector conducted in several different parts of the world suggest that poor quality care is common. The basic principles of care for people with, or suspected of having, tuberculosis are the same worldwide: a diagnosis should be established promptly; standardised treatment regimens should be used with appropriate treatment support and supervision; response to treatment should be monitored; and essential public-health responsibilities must be carried out. Prompt and accurate diagnosis, and effective treatment are essential for good patient care and tuberculosis control. All providers who undertake evaluation and treatment of patients with tuberculosis must recognise that not only are they delivering care to an individual, but they are also assuming an important public-health function. The International Standards for Tuberculosis Care (ISTC) describe a widely endorsed level of care that all practitioners should seek to achieve in managing individuals who have, or are suspected of having, tuberculosis. The document is intended to engage all care providers in delivering high quality care for patients of all ages, including those with smear-positive, smear-negative, and extra-pulmonary tuberculosis, tuberculosis caused by drug-resistant *Mycobacterium tuberculosis* complex, and tuberculosis combined with HIV infection.

Healthcare seeking among individuals with cough and tuberculosis: a population-based study from rural India. *Int J Tuberc Lung Dis*, 2006 10(9): 995-1000.

Fochsen G K, Deshpande, et al.

SETTING: Ujjain district, Madhya Pradesh, India.

OBJECTIVE: To describe and compare health care seeking among men and women with cough of >3 weeks, with special focus on the utilisation of private and public health care. **DESIGN:** A

population-based cross-sectional survey including 45 719 individuals aged > or = 15 years. **RESULTS:** The prevalence of cough was respectively 2.8% and 1.2% among men and women. The majority of men and women reported seeking health care for their symptoms (69% vs. 71%), but only 23% visited a public provider at some point during their illness. A similar health care seeking pattern was found for patients diagnosed with tuberculosis (TB) in our survey. No significant differences in health care seeking were found between men and women. Only 13% of those seeking care reported having had a sputum smear examination since the onset of cough. Factors associated with sputum examination were history of TB, haemoptysis and visiting a public provider. **CONCLUSION:** The low utilisation of public health care services and the few sputum examinations reported in this rural Indian setting illustrate the need for improved diagnostic practices as well as involvement of private providers in TB control activities.

DOTS at a tertiary care centre in northern India: successes, challenges & the next steps in tuberculosis control. *Indian J Med Res*, 2006, 123(5): 702-6.

Tahir M, Sharma S K, et al.

BACKGROUND & OBJECTIVES: The past decade has seen a rapid expansion of directly observed treatment, short-course (DOTS) centres throughout India, under the guidance of the Revised National Tuberculosis Control Programme (RNTCP). While expansion has been rapid and extensive, few reports exist detailing individual DOTS centres' experiences, their challenges, and their successes. We present a brief report on the status of a DOTS centre being run at a large tertiary care centre in northern India for almost four years (2001-2005). **METHODS:** The DOTS centre followed RNTCP guidelines for the evaluation and treatment of suspected TB cases. A register carrying detailed information of all patients seen at

the DOTS centre was kept by the senior clinician. Data from this register were extracted and analysed for descriptive measures. **RESULTS:** A total of 1490 patients were evaluated. Of the 768 patients with cough, 27 per cent (211) were found to be sputum positive for acid-fast bacilli (AFB). Among patients who were initiated on anti-tuberculosis medications, cure was achieved in 92 per cent (71 of 77) of new sputum smear positive patients; treatment completion was achieved in 91 per cent (91 of 100) of extrapulmonary TB (EPTB) and 75 per cent (46 of 61) of sputum-negative pulmonary TB patients. Overall treatment success was achieved in 86 per cent (229 of 266). **CONCLUSION:** Treatment results were in keeping with the RNTCP guidelines. Tertiary care centres appear to be excellent place for education of medical students and operational research. The latter is much needed, as HIV-TB co-infection, multi-drug resistant TB, and EPTB continue to be major public health threats even in the era of DOTS.

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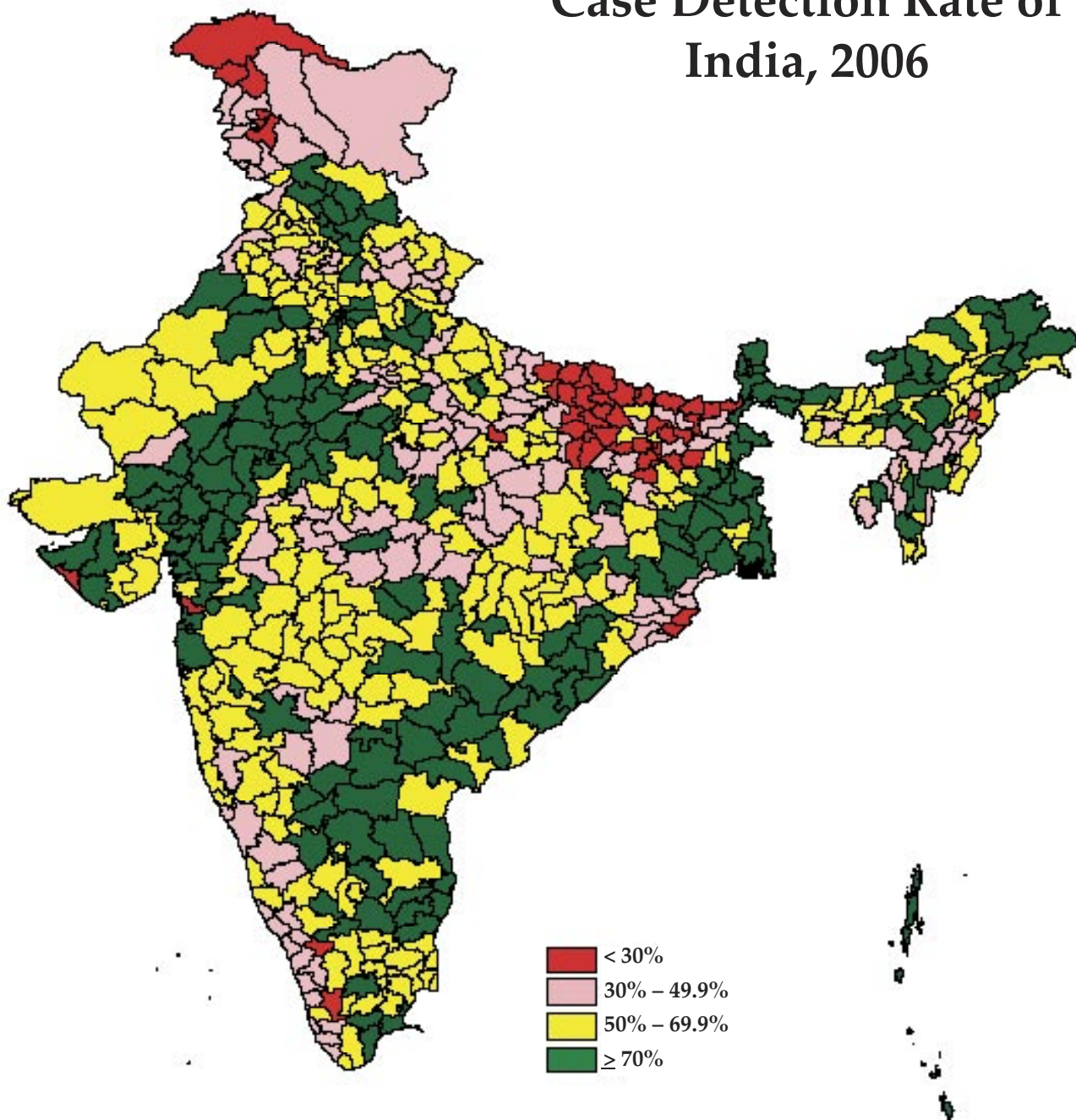
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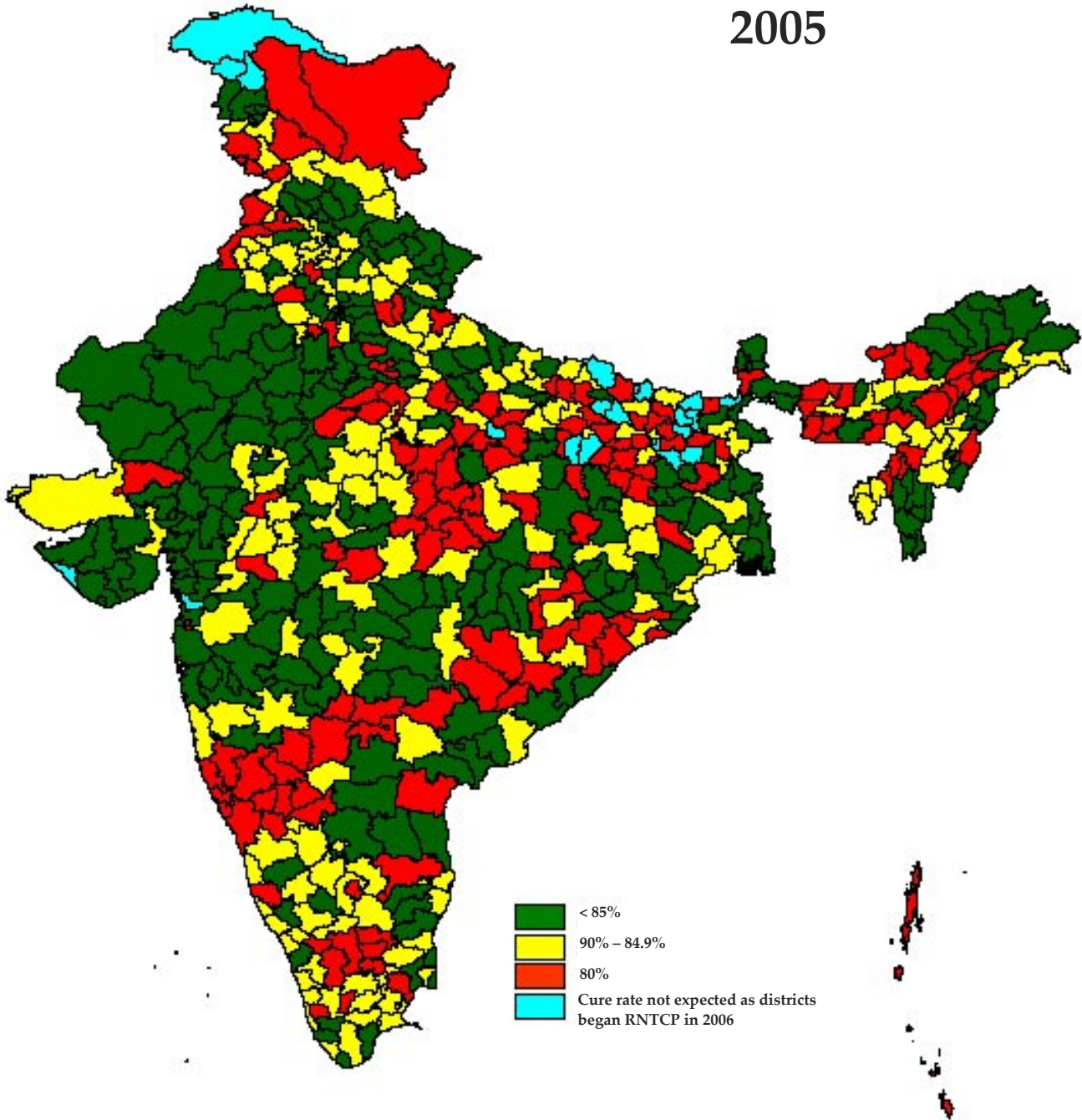
PERFORMANCE OF RNTCP

Chapter 7

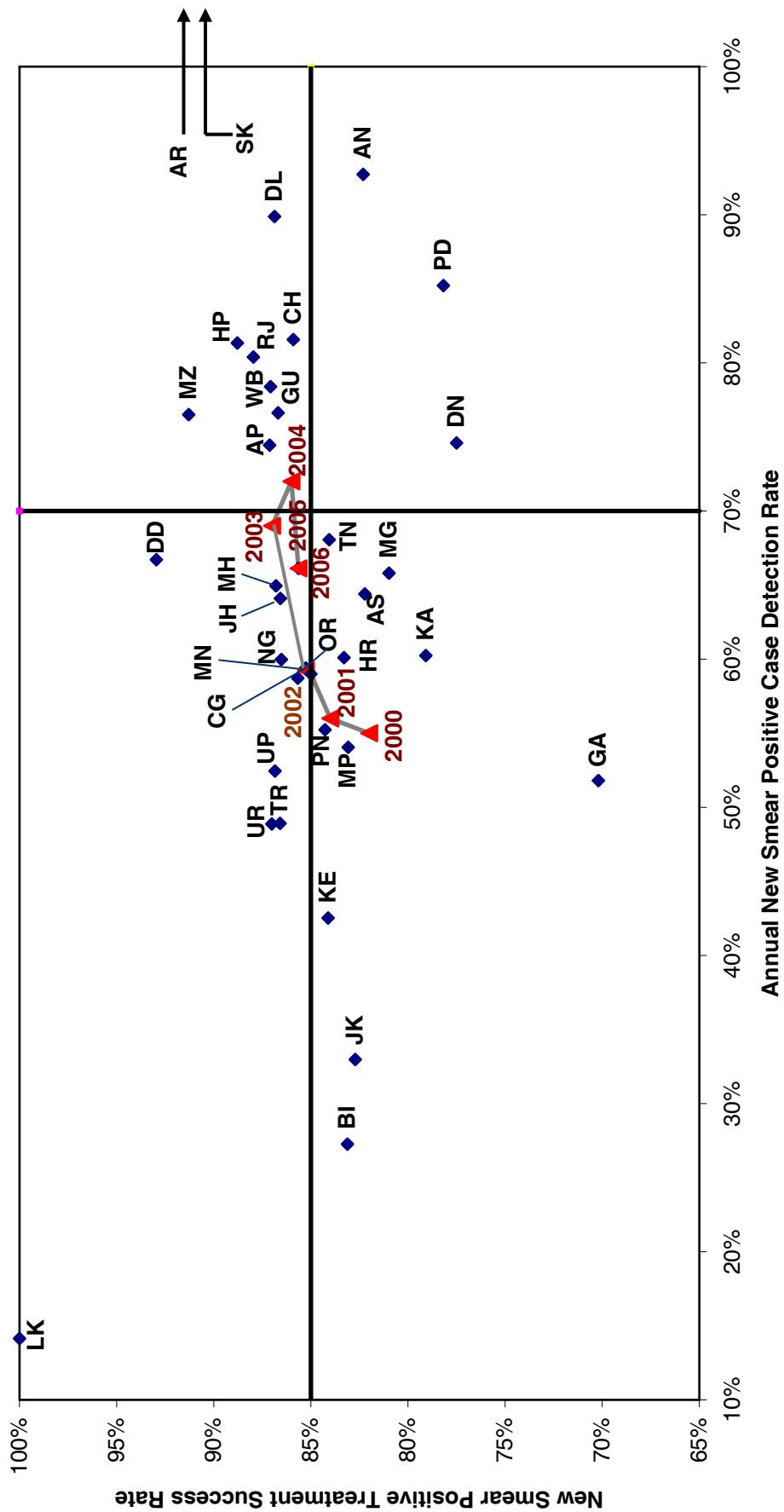
New Smear Positive TB Case Detection Rate of India, 2006



Cure rate by district, India 2005



Case Detection Rate and Treatment Success Rates in India for 2006/2005



AP- Andhra Pradesh; AN- Andaman & Nicobar; AR-Arunachal Pradesh; AS-Assam; BI-Bihar; CH-Chandigarh; CG-Chhatisgarh; DD- Daman & Diu; DL-Dadra & Nager Haveli; GA-Goa; GU-Gujarat; HR-Haryana; HP-Himachal Pradesh; JK- Jammu & Kashmir; JH-Jharkhand; KA- Karnataka; KE-Kerala; LK- Lakshadweep; MP-Madhya Pradesh; MH-Maharashtra; MN-Manipur; MG-Meghalaya; MZ-Mizoram, NG-Nagaland; OR-Orissa, PD-Puducherry; PN-Punjab; RJ-Rajasthan; SK-Sikkim; TN-Tamil Nadu; TR-Tripura; UP-Uttar Pradesh; UR-Uttaranchal; WB-West Bengal

Annual Performance of RNTCP Case Detection (2006), Smear Conversion (2005) (4th quarter, 2005 and 1st to 3rd quarter, 2006) and Treatment Outcomes (2005)

State	Population (in lakh) covered by RNTCP ¹	No. of suspects examined	Suspects examined per lakh population per quarter	No of smear positive patients diagnosed ²	% of S+ve cases among suspects	Total patients registered for treatment ³	Annual total case detection rate	New smear positive patients registered for treatment	Annual new smear positive case detection rate (%)	% 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
Andaman & Nicobar	4	4040	256	379	9%	920	234	274	70	93%	299	235
Andhra Pradesh	804	447523	139	66924	15%	107131	133	44907	56	74%	34995	9394
Arunachal Pradesh	12	10824	231	1352	12%	2607	223	922	79	105%	765	296
Assam	290	114640	99	18573	16%	32311	111	14012	48	64%	9853	2925
Bihar	908	222802	61	29289	13%	61151	64	19615	20	27%	26361	3020
Chandigarh	10	14048	347	1662	12%	2322	229	785	77	82%	441	675
Chhattisgarh	229	109289	120	13273	12%	28209	123	10737	47	59%	11620	2887
D & N Haveli	2	1613	163	187	12%	391	158	148	60	75%	94	72
Daman & Diu	2	3020	424	198	7%	280	157	95	53	67%	70	40
Delhi	161	156732	244	25427	16%	47606	296	13717	85	90%	9444	13711
Goa	15	10356	168	1091	11%	2036	132	637	41	52%	552	466
Gujarat	548	348473	159	60231	17%	79821	146	33601	61	77%	12746	9236
Haryana	230	159318	173	22893	14%	34693	151	13155	57	60%	7388	4961
Himachal Pradesh	64	61070	238	8354	14%	13303	207	4965	77	81%	2414	2778
Jammu & Kashmir	116	72411	156	5229	7%	10268	88	3635	31	33%	2617	2574
Jharkhand	292	112432	96	18289	16%	33035	113	14024	48	64%	12265	1990
Karnataka	561	344976	154	40886	12%	64842	116	25363	45	60%	15318	11420
Kerala	336	229692	171	13866	6%	25248	75	10707	32	43%	5447	6014
Lakshadweep	1	189	72	6	3%	16	24	7	11	14%	6	3
Madhya Pradesh	668	267667	100	45923	17%	74435	111	28884	43	54%	23467	7192
Maharashtra	1041	583510	140	76759	13%	138837	133	54093	52	65%	39547	20658
Manipur	26	19159	187	1478	8%	4603	180	1141	45	59%	1584	871
Meghalaya	25	11582	117	1832	16%	3929	159	1220	49	66%	846	815
Mizoram	10	7835	205	776	10%	1912	200	548	57	77%	449	591
Nagaland	21	9470	111	1279	14%	2695	126	959	45	60%	642	461

Annual Performance (Contd.)

State	Population (in lakh) covered by RNTCP ¹	No. of suspects examined	Suspects examined per lakh population per quarter	No of smear positive patients diagnosed ²	% of S+ve cases among suspects	Total patients registered for treatment ³	Annual total case detection rate	New smear positive patients registered for treatment	Annual new smear positive case detection rate (%)	% 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
Orissa	391	183290	117	25741	14%	44790	115	19663	50	61%	12346	6864
Puducherry	10	16477	395	1481	9%	1513	145	666	64	68%	311	286
Punjab	260	154763	149	20592	13%	34537	133	13630	52	63%	7918	6424
Rajasthan	624	365455	146	70912	19%	107783	173	40152	64	56%	31649	12092
Sikkim	6	7432	321	787	11%	1458	252	505	87	65%	273	366
Tamil Nadu	653	619549	237	49317	8%	87065	133	33314	51	57%	24711	17441
Tripura	34	12401	91	1611	13%	2314	68	1255	37	72%	478	232
Uttar Pradesh	1839	922839	125	133715	14%	224465	122	91610	50	55%	74719	20190
Uttarakhand	92	59751	162	7685	13%	11653	126	4279	46	56%	3416	1465
West Bengal	858	560008	163	66873	12%	109319	127	50435	59	66%	25445	14535
Grand Total	11142	6224636	140	834870	13%	1397498	125	553660	50	58%	400496	183180

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, Puducherry, Tamil Nadu) is 75 and West Zone (Chhattisgarh, Dadra & Nagar Haveli, Daman & Diu, Goa, Gujarat, Madhya Pradesh, Maharashtra, Rajasthan) is 80; Orissa is 85

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

² Smear positive patients diagnosed include new smear positive cases and smear positive retreatment cases

³ Total patients registered for treatment includes new sputum smear positive cases, new extra-pulmonary cases, smear positive retreatment cases and 'Others'

Annual Performance of RNTCP Case Detection (2006), Smear Conversion (4th quarter, 2005 and 1st to 3rd quarter, 2006) and Treatment Outcomes (2005)

State	% 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	Cure rate of new smear positive patients*	Treatment success rate of new smear positive patients*	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	29%	76	22%	135 (17%)	91%	78%	82%	276 (99%)	271 (97%)	15 (83%)
Andhra Pradesh	11%	14434	24%	2539 (3%)	90%	84%	87%	37382 (84%)	43188 (96%)	27616 (74%)
Arunachal Pradesh	15%	403	30%	56 (3%)	90%	87%	90%	878 (94%)	924 (99%)	669 (84%)
Assam	11%	3409	20%	888 (3%)	87%	79%	82%	11591 (85%)	13303 (96%)	7904 (83%)
Bihar	6%	6979	26%	2174 (4%)	80%	74%	83%	14928 (78%)	17424 (91%)	4263 (70%)
Chandigarh	36%	272	26%	225 (12%)	91%	86%	86%	686 (87%)	771 (98%)	603 (94%)
Chhattisgarh	11%	1847	15%	1309 (5%)	89%	83%	86%	9262 (86%)	10607 (99%)	6438 (80%)
D & N Haveli	23%	48	24%	15 (5%)	84%	78%	78%	145 (98%)	148 (100%)	62 (100%)
Daman & Diu	20%	40	30%	1 (0%)	89%	86%	93%	95 (100%)	95 (100%)	60 (91%)
Delhi	37%	6702	33%	5223 (14%)	89%	87%	87%	12384 (91%)	13377 (100%)	11057 (97%)
Goa	28%	236	27%	161 (10%)	84%	70%	70%	506 (79%)	627 (98%)	323 (77%)
Gujarat	17%	17701	35%	2690 (5%)	91%	86%	87%	28893 (86%)	32971 (98%)	21702 (83%)
Haryana	19%	7246	36%	1395 (5%)	88%	82%	83%	11031 (87%)	12308 (95%)	9034 (88%)
Himachal Pradesh	27%	2639	35%	229 (2%)	92%	87%	89%	3955 (90%)	4092 (90%)	3493 (84%)
Jammu & Kashmir	29%	1081	23%	219 (2%)	86%	81%	83%	2605 (98%)	2295 (99%)	962 (87%)
Jharkhand	7%	2857	17%	1175 (4%)	88%	82%	87%	10306 (77%)	13067 (96%)	5267 (63%)
Karnataka	22%	9412	27%	3078 (6%)	84%	77%	79%	21041 (84%)	23435 (92%)	15617 (77%)
Kerala	27%	2353	18%	1930 (9%)	85%	82%	84%	9475 (88%)	9888 (92%)	7021 (76%)
Lakshadweep	19%	0	0%	0 (0%)	20%	100%	100%	7 (100%)	7 (26%)	1 (100%)
Madhya Pradesh	12%	11580	29%	2298 (4%)	87%	79%	83%	22550 (82%)	26824 (95%)	16159 (73%)
Maharashtra	18%	15356	22%	6825 (6%)	91%	86%	87%	44512 (85%)	50583 (95%)	38763 (82%)
Manipur	24%	355	24%	276 (8%)	88%	84%	85%	1132 (98%)	1061 (92%)	827 (86%)

Annual Performance (Contd.)

State	% 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	Cure rate of new smear positive patients*	Treatment success rate of new smear positive patients*	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	28%	567	32%	246	84%	78%	81%	1008	1165	769
Mizoram	37%	193	26%	82	93%	91%	91%	544	546	1205
Nagaland	22%	372	28%	189	91%	86%	87%	630	645	377
Orissa	18%	3666	16%	1486	86%	79%	85%	12848	15441	9973
Puducherry	23%	222	25%	21	85%	73%	78%	491	638	490
Punjab	23%	5177	28%	1680	87%	81%	84%	12418	13323	8869
Rajasthan	14%	20491	34%	4142	91%	86%	88%	31511	37365	26905
Sikkim	32%	214	30%	183	87%	88%	88%	486	502	446
Tamil Nadu	23%	9229	22%	8255	88%	82%	84%	26550	32347	23928
Tripura	12%	289	19%	21	85%	82%	87%	670	650	269
Uttar Pradesh	11%	31785	26%	10118	89%	84%	87%	77193	88383	52188
Uttarakhand	16%	2112	33%	523	93%	86%	87%	3909	4198	3574
West Bengal	16%	11621	19%	4910	90%	86%	87%	39738	47691	35242
Grand Total	16%	190964	26%	64697	89%	83%	86%	451636	520160	342091

*Cure rate and success rate are not expected for states that began implementing RNTCP after 4th quarter 2005

Treatment Outcome of New Cases for 2005

Implementing states	New Smear Positive ¹						New Smear Negative ²						New Extra Pulmonary ²						
	Regist- ered	Cure	Comp- leted	Died	Failure	De- faulted	Trans- out	Regist- ered	Comp- leted	Died	Failure	De- faulted	Trans- out	Regist- ered	Comp- leted	Died	Failure	De- faulted	Trans- out
Andaman & Nicobar	130	78.5%	3.8%	6.2%	0.8%	7.7%	3.1%	86	84.9%	3.5%	0.0%	10.5%	1.2%	115	83.5%	7.0%	0.0%	7.0%	2.6%
Andhra Pradesh	44061	84.3%	2.9%	4.9%	2.6%	4.6%	0.8%	39826	87.1%	4.6%	0.7%	7.3%	0.5%	8861	89.0%	2.7%	0.2%	7.7%	0.4%
Arunachal Pradesh	813	87.5%	2.3%	2.1%	3.7%	4.1%	0.4%	737	77.7%	9.8%	1.0%	10.0%	1.5%	277	79.4%	8.3%	0.4%	10.8%	1.1%
Assam	11886	78.5%	3.7%	4.8%	2.3%	9.9%	0.8%	10083	80.3%	4.1%	0.7%	13.9%	1.0%	2566	87.4%	2.7%	0.2%	8.7%	0.9%
Bihar	8464	74.0%	9.1%	4.7%	2.3%	9.5%	0.3%	13652	85.9%	2.5%	0.7%	10.5%	0.3%	1499	90.3%	1.2%	0.3%	7.9%	0.3%
Chandigarh	745	85.9%	0.0%	3.8%	3.9%	3.2%	3.2%	574	94.1%	1.7%	1.4%	2.1%	0.7%	691	93.5%	1.2%	0.3%	2.2%	2.9%
Chhattisgarh	9702	83.2%	2.5%	5.2%	1.2%	7.5%	0.3%	9199	85.9%	3.6%	0.4%	9.8%	0.3%	2208	92.6%	2.3%	0.0%	4.7%	0.4%
D & N Haveli	80	77.5%	0.0%	3.8%	3.8%	11.3%	3.8%	22	72.7%	9.1%	0.0%	18.2%	0.0%	22	86.4%	0.0%	0.0%	9.1%	4.5%
Daman & Diu	71	85.9%	7.0%	0.0%	0.0%	7.0%	0.0%	22	95.5%	0.0%	0.0%	4.5%	0.0%	13	84.6%	7.7%	0.0%	7.7%	0.0%
Delhi	12733	86.6%	0.2%	2.4%	3.9%	5.5%	1.4%	9298	91.7%	1.9%	1.3%	4.6%	0.6%	13342	95.7%	0.9%	0.2%	2.7%	0.5%
Goa	604	69.5%	0.7%	3.3%	4.0%	20.4%	1.8%	542	76.4%	3.7%	1.3%	17.2%	1.5%	282	80.5%	2.5%	1.4%	13.8%	1.8%
Gujarat	30289	86.2%	0.5%	4.2%	2.8%	5.4%	0.9%	15398	83.9%	4.0%	1.1%	10.2%	0.8%	9210	89.1%	2.1%	0.1%	8.0%	0.6%
Haryana	12630	81.9%	1.4%	4.0%	4.2%	8.0%	0.5%	7923	83.1%	4.2%	2.1%	10.4%	0.3%	5205	91.9%	1.9%	0.2%	5.8%	0.3%
Himachal Pradesh	4833	87.1%	1.7%	4.0%	2.9%	4.1%	0.2%	2763	87.3%	4.8%	1.3%	6.3%	0.3%	3140	92.5%	2.4%	0.2%	4.5%	0.4%
Jammu & Kashmir	1643	80.5%	2.2%	5.1%	2.3%	8.5%	1.3%	1231	82.4%	4.1%	0.4%	12.4%	0.7%	1213	87.9%	5.0%	0.2%	4.9%	2.1%
Jharkhand	9949	81.6%	5.0%	5.0%	1.6%	6.5%	0.2%	11318	88.7%	2.4%	0.6%	8.1%	0.1%	1482	91.5%	1.8%	0.3%	5.8%	0.7%
Karnataka	26724	77.3%	1.7%	6.5%	3.4%	8.7%	2.3%	18777	82.0%	6.1%	0.9%	9.0%	2.0%	11187	88.2%	3.7%	0.2%	5.2%	2.6%
Kerala	11174	81.8%	2.3%	4.9%	4.2%	6.1%	0.7%	5204	86.9%	4.8%	0.6%	7.1%	0.6%	5940	91.3%	2.8%	0.1%	5.4%	0.7%
Lakshadweep	1	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3	100.0%	0.0%	0.0%	0.0%	0.0%	0					
Madhya Pradesh	27699	79.5%	3.6%	4.8%	2.6%	9.1%	0.4%	23588	85.3%	2.7%	0.9%	10.7%	0.3%	6587	91.8%	1.6%	0.2%	6.0%	0.4%
Maharashtra	54995	85.8%	1.0%	5.0%	2.3%	5.2%	0.7%	44647	86.3%	3.8%	0.9%	8.4%	0.6%	21632	89.4%	2.7%	0.3%	7.1%	0.6%
Manipur	1045	84.3%	1.0%	2.8%	2.2%	9.3%	0.5%	1654	84.9%	2.7%	0.3%	11.9%	0.2%	968	88.2%	1.7%	0.0%	10.0%	0.1%
Meghalaya	1167	78.3%	2.7%	4.0%	7.4%	7.1%	0.5%	956	84.4%	5.6%	1.4%	8.4%	0.2%	755	94.2%	2.1%	0.1%	3.0%	0.5%
Mizoram	551	90.9%	0.4%	2.5%	2.7%	3.3%	0.2%	515	94.4%	5.8%	1.6%	7.2%	0.0%	506	95.1%	2.6%	0.2%	2.2%	0.0%
Nagaland	957	85.8%	0.7%	2.0%	3.0%	7.2%	0.7%	789	78.5%	4.3%	0.6%	16.5%	0.1%	561	84.1%	2.1%	0.2%	12.8%	0.7%
Orissa	20019	78.8%	6.5%	5.4%	1.2%	7.6%	0.5%	12404	87.7%	4.6%	0.3%	6.4%	0.9%	6765	90.3%	2.8%	0.1%	6.3%	0.5%
Puducherry	614	72.8%	5.4%	4.4%	1.6%	15.8%	0.0%	291	82.5%	6.5%	0.3%	10.7%	0.0%	274	88.7%	2.9%	0.0%	8.4%	0.0%
Punjab	11926	81.2%	3.1%	5.0%	2.6%	7.0%	1.1%	7708	86.3%	4.2%	1.0%	7.4%	1.1%	5521	92.0%	2.5%	0.1%	4.4%	1.1%

Treatment Outcome (Contd.)

Implementing states	New Smear Positive ¹							New Smear Negative ²							New Extra Pulmonary ²						
	Regist- ered	Cure	Comp- leted	Died	Failure	De- faulted	Trans out	Regist- ered	Comp- leted	Died	Failure	De- faulted	Trans out	Regist- ered	Comp- leted	Died	Failure	De- faulted	Trans out		
Rajasthan	38407	86.4%	1.5%	3.1%	1.9%	6.6%	0.3%	31801	87.9%	2.8%	0.9%	8.2%	0.2%	11812	90.6%	1.7%	0.2%	6.8%	0.7%		
Sikkim	536	87.9%	0.0%	2.8%	6.5%	1.9%	0.9%	314	89.8%	4.1%	1.3%	2.9%	1.9%	412	93.4%	2.4%	0.7%	2.4%	1.0%		
Tamil Nadu	37428	82.4%	1.6%	5.5%	2.3%	7.7%	0.5%	28601	89.0%	4.3%	0.3%	6.1%	0.3%	17055	92.8%	2.9%	0.1%	3.8%	0.4%		
Tripura	768	82.2%	4.4%	5.7%	2.6%	4.9%	0.1%	337	85.8%	5.6%	1.5%	7.1%	0.0%	178	92.1%	3.4%	0.6%	3.9%	0.0%		
Uttar Pradesh	71171	83.8%	3.0%	3.9%	1.2%	7.9%	0.1%	61873	88.3%	2.1%	0.6%	8.9%	0.1%	16068	94.1%	0.9%	0.1%	4.8%	0.1%		
Uttarakhand	4419	86.1%	0.9%	3.3%	2.2%	7.0%	0.5%	2994	90.1%	2.6%	1.3%	5.2%	0.7%	1237	92.3%	1.1%	0.1%	5.9%	0.6%		
West Bengal	48779	86.1%	1.0%	4.0%	2.5%	6.2%	0.3%	26874	86.8%	4.5%	0.7%	7.8%	0.2%	13675	91.9%	2.9%	0.2%	4.8%	0.2%		
Grand Total	507013	83.3%	2.3%	4.5%	2.4%	6.9%	0.6%	392004	86.7%	3.6%	0.8%	8.5%	0.5%	171259	91.3%	2.3%	0.2%	5.6%	0.6%		

Values for shaded areas are not expected

¹ Treatment success for New Smear Positive is cured and treatment completed.

² Treatment success for New Smear Negative and New Extra Pulmonary are treatment completed.

**Outcome of Smear Positive Retreatment cases for India,
2005 (excluding "Others")**

Type of retreatment case	Cured	Success	Died	Failure	Defaulted	Transferred out	No. registered
Relapse	66.6%	72.7%	7.2%	5.2%	13.9%	0.8%	75232
Failure	51.5%	58.9%	8.2%	14.1%	17.9%	0.9%	17771
Treatment after default	59.2%	66.9%	7.6%	4.3%	19.5%	1.8%	72280
Total	61.7%	68.7%	7.5%	5.7%	16.8%	1.2%	165283

**State-wise outcome of Smear Positive Retreatment cases
for 2005 (excluding "Others")**

Implementing states	Cured	Success	Died	Failure	Defaulted	Transferred out	No. registered
Andaman & Nicobar	76.9%	92.3%	0.0%	2.6%	2.6%	2.6%	39
Andhra Pradesh	59.1%	69.0%	8.2%	6.8%	15.0%	0.9%	12980
Arunachal Pradesh	68.9%	71.2%	6.3%	15.0%	6.9%	0.6%	347
Assam	52.5%	63.3%	7.2%	7.0%	19.2%	3.2%	3033
Bihar	57.7%	72.3%	8.4%	4.4%	14.6%	0.5%	2775
Chandigarh	71.1%	72.2%	4.8%	5.5%	11.0%	6.5%	291
Chhattisgarh	63.0%	69.3%	7.9%	4.3%	17.8%	0.7%	1631
D & N Haveli	68.8%	68.8%	12.5%	0.0%	18.8%	0.0%	16
Daman & Diu	74.1%	74.1%	7.4%	11.1%	7.4%	0.0%	27
Delhi	69.6%	70.4%	6.1%	7.2%	14.3%	2.0%	6029
Goa	49.7%	50.3%	4.5%	7.9%	33.3%	4.0%	177
Gujarat	54.9%	60.1%	8.7%	6.5%	22.3%	2.4%	15986
Haryana	63.5%	70.1%	7.0%	6.1%	16.2%	0.7%	6813
Himachal Pradesh	69.6%	75.9%	6.9%	7.4%	9.4%	0.5%	2210
Jammu & Kashmir	70.9%	73.5%	7.5%	7.2%	9.4%	2.4%	374
Jharkhand	63.6%	77.3%	6.3%	4.2%	12.0%	0.6%	2305
Karnataka	49.3%	56.6%	9.5%	7.8%	21.3%	4.7%	8924
Kerala	62.9%	69.0%	7.2%	7.3%	16.3%	1.2%	2100
Lakshadweep							0
Madhya Pradesh	55.6%	65.9%	7.7%	6.8%	18.9%	0.6%	10998
Maharashtra	58.3%	63.8%	9.0%	6.2%	19.9%	1.1%	14973
Manipur	68.2%	69.7%	4.3%	5.2%	20.8%	0.0%	327
Meghalaya	48.7%	58.1%	6.2%	17.1%	16.5%	2.1%	485
Mizoram	79.1%	80.2%	4.3%	5.3%	9.6%	0.5%	187
Nagaland	78.7%	79.9%	4.0%	3.8%	12.0%	0.3%	399
Orissa	52.1%	66.5%	7.9%	4.0%	20.5%	0.8%	3256
Puducherry	46.6%	53.4%	9.1%	3.6%	34.0%	0.0%	253
Punjab	64.4%	71.0%	8.1%	5.8%	13.2%	1.9%	4406
Rajasthan	69.3%	76.9%	5.7%	3.7%	12.8%	1.0%	19397
Sikkim	72.1%	72.1%	6.7%	15.4%	4.2%	1.7%	240
Tamil Nadu	56.2%	61.4%	8.8%	6.4%	22.4%	0.9%	7656
Tripura	63.6%	75.9%	6.4%	5.9%	11.8%	0.0%	187
Uttar Pradesh	69.0%	76.1%	6.2%	3.2%	13.4%	0.3%	23709
Uttarakhand	75.3%	76.9%	5.9%	3.6%	12.9%	0.7%	1939
West Bengal	64.3%	67.8%	7.6%	7.1%	16.9%	0.6%	10814
Grand Total	61.7%	68.7%	7.5%	5.7%	16.8%	1.2%	165283

Values for shaded areas are not expected

Annual Performance of RNTCP Case Detection (2006), Smear Conversion (4th Quarter, 2005 and 1st to 3rd Quarter 2006) and Treatment Outcomes

State	District	Population (in lakh) covered by RNTCP ¹	No. of TB suspects examined	% of smear positive TB cases ² among suspects	Total patients registered for treatment ³	Annualized total case detection rate	New smear positive patients registered for treatment	Annualized new smear positive case detection rate (%)	% 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	No of smear positive retreatment cases registered for treatment	No (%) of pediatric cases out of all New cases	3 month conversion rate of new smear positive patients ⁴	Cure rate of smear positive patients ⁵	Treatment success rate of new smear positive patients ⁵
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Andaman & Nicobar																
Andaman & Nicobar	Andaman & Nicobar Islands *	4	4040	9%	920	234	274	70	48%	299	235	76	135	91%	78%	82%
Andhra Pradesh																
Andhra Pradesh	Adilabad *	26	10512	17%	2714	103	1438	55	65%	776	124	367	45	92%	85%	87%
Andhra Pradesh	Anantapur	39	27878	13%	5777	149	2543	66	60%	1691	564	819	106	91%	86%	86%
Andhra Pradesh	Bhadrachalam	8	8258	14%	1776	215	869	105	59%	608	58	224	7	91%	87%	92%
Andhra Pradesh	Chittoor	40	21846	11%	4077	103	1628	41	56%	1262	519	586	109	85%	79%	84%
Andhra Pradesh	Cuddapah	27	12857	15%	3963	145	1439	53	47%	1652	283	406	40	91%	86%	89%
Andhra Pradesh	East Godavari	52	28269	13%	6835	132	2649	51	53%	2338	933	620	385	92%	84%	86%
Andhra Pradesh	Guntur	47	41142	14%	7640	163	3377	72	56%	2670	373	933	103	92%	86%	88%
Andhra Pradesh	Hyderabad	39	39025	15%	6356	162	2405	61	62%	1499	1478	758	337	91%	88%	88%
Andhra Pradesh	Karimnagar	37	13872	15%	3452	93	1479	40	55%	1225	159	564	16	91%	86%	89%
Andhra Pradesh	Khammam	19	9256	20%	3041	160	1314	69	55%	1071	201	443	35	91%	85%	90%
Andhra Pradesh	Krishna	45	22202	16%	5846	130	2253	50	52%	2090	280	836	124	91%	86%	87%
Andhra Pradesh	Kurnoor	37	18745	15%	5963	160	2105	56	44%	2656	247	674	152	91%	85%	86%
Andhra Pradesh	Mahbubnagar	37	16476	15%	4113	110	1982	53	59%	1371	138	590	53	90%	85%	85%
Andhra Pradesh	Medak	28	10740	14%	2680	95	1168	41	66%	615	382	468	117	91%	73%	88%
Andhra Pradesh	Nalgonda	34	13315	22%	4259	124	1895	55	61%	1189	271	859	40	90%	82%	87%
Andhra Pradesh	Nellore	28	14511	15%	3834	136	1488	53	58%	1083	294	720	45	92%	88%	91%
Andhra Pradesh	Nizamabad	25	9462	13%	2419	97	991	40	47%	1127	104	186	68	92%	87%	89%
Andhra Pradesh	Prakasam	32	16325	11%	4088	126	1631	50	49%	1669	167	493	38	76%	71%	84%

(Contd.)

Annual Performance of Districts (Contd...)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
State	District	Population (in lakh) covered by RNTCP ¹	No. of TB suspects examined	% of smear positive TB cases ² among suspects	Total patients registered for treatment ³	Annualized total case detection rate	New smear positive patients registered for treatment	Annualized new smear positive case detection rate (%)	% 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	No of smear positive retreatment cases registered for treatment	No (%) of pediatric cases out of all New cases	3 month conversion rate of new smear positive patients ⁴	Cure rate of new smear positive patients ⁵	Treatment success rate of new smear positive patients ⁵
Andhra Pradesh	Rangareddi	37	21382	18%	4989	134	2408	65	69%	1082	642	765	103	79%	76%	77%
Andhra Pradesh	Srikakulam	27	15624	13%	4066	151	1629	61	50%	1624	395	374	139	92%	86%	91%
Andhra Pradesh	Visakhapatnam	40	23125	14%	5377	134	2250	56	58%	1616	751	582	100	92%	88%	89%
Andhra Pradesh	Vizianagaram	24	17381	13%	3447	145	1590	67	67%	791	436	540	131	92%	88%	91%
Andhra Pradesh	Warangal	34	15082	21%	4378	128	1986	58	61%	1291	185	837	64	87%	77%	80%
Andhra Pradesh	West Godavari	40	20238	17%	6041	150	2390	59	54%	1999	410	790	182	96%	93%	93%
Arunachal Pradesh																
Arunachal Pradesh	Along DTC														92%	92%
Arunachal Pradesh	Bomdila DTC														75%	85%
Arunachal Pradesh	Changlang **	1	578	11%	126	94	58	43	64%	32	3	19	0	86%		
Arunachal Pradesh	Deomali DTC															
Arunachal Pradesh	Dibang Valley	1	584	12%	121	196	68	110	79%	18	4	31	2	97%		
Arunachal Pradesh	East Kameng *	1	795	15%	190	311	61	100	60%	40	21	46	3	78%		
Arunachal Pradesh	East Siang *	1	938	12%	234	250	92	98	51%	90	17	33	4	90%		
Arunachal Pradesh	Lohit **	2	1277	12%	270	175	122	79	67%	61	12	48	8	96%		
Arunachal Pradesh	Lower Subansiri *	1	904	8%	201	192	51	49	37%	87	28	33	4	86%		
Arunachal Pradesh	Papum Pare *	1	2775	14%	702	538	186	142	41%	271	90	82	17	92%		
Arunachal Pradesh	Pasighat DTC														93%	93%
Arunachal Pradesh	Tawang *	0.4	364	13%	91	245	41	110	61%	26	11	10	0	94%		
Arunachal Pradesh	Tezu DTC															
Arunachal Pradesh	Tirap †	1	802	12%	229	213	65	60	81%	50	61	31	12	87%		
Arunachal Pradesh	Upper Siang *	0.4	390	8%	75	211	33	93	66%	17	11	13	1	97%		
Arunachal Pradesh	Upper Subansiri *	1	461	18%	127	215	58	98	67%	28	10	22	4	78%		
Arunachal Pradesh	West Kameng *	1	475	14%	104	130	43	54	72%	19	18	20	0	93%		

Value for blank cells are not expected as these districts/reporting units have been newly created or have stopped reporting in 2006 due to merger with other reporting units. Treatment outcome, for the cohort registered in 2005 in these units is given.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Arunachal Pradesh	West Siang *	1	481	11%	137	123	44	40	53%	26	10	15	1	96%		
Arunachal Pradesh	Ziro DTC														89%	89%
Assam																
Assam	Barpeta	18	4964	17%	1322	74	688	38	51%	275	108	170	24	2%	85%	81%
Assam	Bongaigaon	10	3753	16%	990	100	446	45	60%	264	48	126	11	1%	90%	84%
Assam	Cachar	16	5975	12%	1336	85	483	31	41%	591	77	95	25	2%	90%	78%
Assam	Darrang	16	7077	13%	1778	109	706	43	57%	705	83	162	32	2%	85%	83%
Assam	Dhemaji	6	2013	19%	560	90	308	50	66%	163	23	59	17	3%	82%	77%
Assam	Dhubri	18	5670	19%	2066	116	802	45	60%	815	78	210	14	1%	83%	84%
Assam	Dibrugarh	13	6955	19%	2159	169	876	69	92%	470	492	212	115	6%	90%	87%
Assam	Goalpara	9	3156	15%	841	94	381	43	57%	254	46	78	19	3%	91%	83%
Assam	Golaghat	10	3083	20%	1032	100	532	52	69%	321	94	62	35	4%	86%	75%
Assam	Hailakandi	6	3195	10%	504	85	248	42	56%	155	35	37	9	2%	86%	71%
Assam	Jorhat	11	4586	15%	1219	111	540	49	66%	329	166	170	59	6%	89%	79%
Assam	Kamrup	27	12939	16%	3132	114	1263	46	61%	642	396	477	61	3%	85%	82%
Assam	Karbi Anglong *	9	3396	20%	1308	148	527	60	79%	484	73	109	34	3%	73%	71%
Assam	Karimganj	11	4133	12%	933	85	390	36	48%	312	65	58	5	1%	90%	78%
Assam	Kokrajhar	10	3596	19%	1441	142	677	67	89%	569	20	93	28	2%	91%	81%
Assam	Lakhimpur	10	3924	14%	1077	111	459	47	63%	379	89	89	31	3%	90%	80%
Assam	Mariagaon	8	3477	18%	992	117	442	52	70%	288	27	129	19	3%	92%	87%
Assam	Nagaon	25	9239	15%	2514	100	1180	47	62%	932	152	191	60	3%	92%	90%
Assam	Nalbari	12	3573	15%	1225	99	500	40	54%	419	138	95	49	5%	89%	89%
Assam	North Cachar Hills *	2	1169	13%	254	125	112	55	74%	73	18	32	2	1%	89%	89%
Assam	Sibsagar	11	3309	20%	1218	106	494	43	57%	250	223	191	67	7%	86%	79%
Assam	Sonitpur	18	8226	19%	2631	144	1135	62	83%	848	211	298	55	3%	85%	83%
Assam	Tinsukia	13	7232	17%	1779	142	823	66	88%	315	263	266	117	8%	91%	85%
Bihar																
Bihar	Araria **	23	6024	13%	1335	57	515	22	29%	523	52	190	27	2%	82%	79%
Bihar	Arwal	7	1588	10%	395	59	111	17	22%	203	8	54	14	4%	87%	83%
Bihar	Aurangabad-BI **	22	4151	16%	1529	70	489	22	30%	661	123	178	106	8%	86%	79%
Bihar	Banka **	18	3057	9%	663	28	212	9	12%	359	12	59	5	1%	82%	NE
Bihar	Begusarai **	26	7486	8%	2437	95	448	17	23%	1593	70	179	134	6%	80%	78%
Bihar	Bhagalpur **	27	10952	10%	2610	98	707	27	35%	1308	86	254	193	9%	84%	81%

(Contd.)

Annual Performance of Districts (Contd...)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
State	District	Population (in lakh) covered by RNTCP ¹	No. of TB suspects examined	% of smear positive TB cases ² among suspects	Total patients registered for treatment ³	Annualized total case detection rate	New smear positive patients registered for treatment	Annualized new smear positive case detection rate (%)	% 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	No of smear positive retreatment cases registered for treatment	No (%) of pediatric cases out of all New cases	3 month conversion rate of new smear positive patients ⁴	Cure rate of new smear positive patients ⁵	Treatment success rate of new smear positive patients ⁵
Bihar	Bhojpur **	24	4377	13%	1172	48	411	17	44%	529	37	95	15	2%	80%	73%
Bihar	Buxar	15	2132	17%	803	52	284	18	43%	376	32	63	11	2%	91%	82%
Bihar	Darbhanga **	36	11153	13%	2679	74	1007	28	37%	818	209	472	93	5%	86%	68%
Bihar	Gaya **	38	8563	16%	2625	69	913	24	32%	1169	61	256	30	1%	82%	59%
Bihar	Gopalganj **	24	3504	17%	1193	51	311	13	18%	221	31	284	11	2%	78%	100%
Bihar	Jamui **	15	2094	17%	762	37	232	11	40%	341	26	118	26	4%	81%	NE
Bihar	Jehanabad **	10	2379	15%	658	67	214	22	29%	247	43	110	34	7%	73%	75%
Bihar	Kaimur **	14	2686	20%	704	46	296	19	26%	144	10	189	6	1%	69%	NE
Bihar	Katihar **	26	8409	16%	1995	76	920	35	47%	634	67	239	64	4%	81%	82%
Bihar	Khagaria **	14	3166	10%	437	23	162	9	12%	94	37	133	7	3%	75%	NE
Bihar	Kishanganj **	14	1547	17%	424	22	188	10	13%	135	17	47	9	3%	60%	NE
Bihar	Lakhisarai **	9	821	9%	277	24	56	5	6%	133	27	14	3	1%	70%	NE
Bihar	Madhepura **	17	4620	12%	893	40	351	16	21%	373	11	140	1	0%	86%	NE
Bihar	Madhubani **	39	9872	11%	1872	48	727	19	25%	590	49	311	24	2%	76%	80%
Bihar	Munger **	12	4225	12%	1001	80	388	31	42%	368	96	92	30	4%	90%	81%
Bihar	Muzaffarpur **	41	11883	17%	4560	111	1654	40	43%	2230	224	282	166	4%	81%	87%
Bihar	Nalanda **	26	4575	8%	1280	49	269	10	14%	753	48	104	13	1%	60%	67%
Bihar	Navada **	20	3923	14%	894	45	380	19	26%	331	37	120	21	3%	83%	80%
Bihar	Pashchim Champaran **	33	6610	13%	1295	29	556	13	17%	274	76	247	12	1%	69%	NE
Bihar	Patna	52	21989	14%	6754	131	2012	39	39%	3194	594	480	596	10%	86%	89%
Bihar	Purba Champaran **	43	6704	15%	1980	46	607	14	19%	820	30	259	22	2%	80%	74%
Bihar	Purnia **	28	9039	12%	2128	76	673	24	32%	902	48	240	41	3%	91%	87%
Bihar	Rohtas	27	7067	10%	1230	34	504	14	19%	473	29	173	10	1%	83%	NE

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	
Bihar	Saharsa **	17	5067	15%	1284	71	504	28	37%	647	20	92	22	2%	78%	NE	NE
Bihar	Samastipur **	37	9418	12%	3280	88	820	22	29%	1700	205	285	121	4%	71%	62%	75%
Bihar	Saran **	36	6472	13%	1469	31	528	11	15%	385	141	298	47	4%	72%	NE	NE
Bihar	Sheikhpura	6	1097	12%	358	47	79	10	14%	159	5	52	1	0%	77%	NE	NE
Bihar	Sheohar	6	895	13%	270	36	80	11	14%	111	12	22	2	1%	87%	NE	NE
Bihar	Sitamarhi **	29	6375	15%	2245	64	619	18	24%	949	33	248	33	2%	66%	NE	NE
Bihar	Siwan	30	3576	15%	1278	32	337	9	11%	543	22	146	11	1%	77%	NE	NE
Bihar	Supaul **	19	4322	11%	752	29	207	8	11%	204	163	153	18	4%	77%	NE	NE
Bihar	Vaishali **	30	10984	11%	3630	122	844	28	38%	1867	229	301	195	7%	78%	67%	90%
Chandigarh																	
Chandigarh	Chandigarh	10	14048	12%	2322	229	785	77	82%	441	675	272	225	12%	91%	86%	86%
Chhattisgarh																	
Chhattisgarh	Bastar *	14	6879	14%	2002	140	679	47	59%	920	160	111	23	1%	89%	73%	79%
Chhattisgarh	Bilaspur-CG	22	9833	12%	2339	107	937	43	53%	803	338	214	117	6%	92%	87%	88%
Chhattisgarh	Dantewada *	8	3206	20%	808	102	489	62	77%	194	45	69	6	1%	57%	67%	74%
Chhattisgarh	Dhamtari	8	4033	12%	802	104	365	47	59%	256	101	66	16	2%	90%	90%	91%
Chhattisgarh	Durg	31	16388	10%	4201	136	1355	44	55%	1836	771	162	225	6%	92%	89%	89%
Chhattisgarh	Janjgir	14	4970	12%	1584	109	540	37	47%	817	116	49	32	2%	90%	71%	82%
Chhattisgarh	Jashpur *	8	4291	9%	741	91	323	40	50%	309	42	30	14	2%	87%	73%	78%
Chhattisgarh	Kanker *	7	4553	11%	957	134	437	61	76%	332	85	56	24	3%	91%	88%	91%
Chhattisgarh	Kawardha **	6	3866	11%	725	113	331	52	64%	217	57	78	55	9%	95%	87%	88%
Chhattisgarh	Korba	11	5112	13%	1071	96	523	47	59%	323	82	115	53	6%	93%	82%	83%
Chhattisgarh	Koriya **	6	2738	10%	704	109	199	31	39%	301	62	68	27	5%	85%	75%	78%
Chhattisgarh	Mahasamund	9	4397	12%	1111	118	461	49	61%	488	87	48	45	4%	91%	84%	85%
Chhattisgarh	Raigarh-CG **	14	5248	17%	1850	133	687	49	62%	931	42	124	16	1%	91%	88%	91%
Chhattisgarh	Raipur	33	17126	13%	4297	130	1780	54	67%	1701	445	294	213	5%	91%	86%	87%
Chhattisgarh	Rajnandgaon	14	6297	14%	1914	136	768	55	68%	625	253	153	137	8%	88%	85%	86%
Chhattisgarh	Surguja †	22	10352	10%	3103	143	863	40	50%	1567	201	210	306	12%	92%	88%	89%
D & N Haveli																	
D & N Haveli	Dadra & Nagar Haveli †	2	1613	12%	391	158	148	60	75%	94	72	48	15	5%	84%	78%	78%

(Contd.)

Annual Performance of Districts (Contd...)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
State	District	Population (in lakh) covered by RNTCP ¹	No. of TB suspects examined	% of smear positive TB cases ² among suspects	Total patients registered for treatment ³	Annualized total case detection rate	New smear positive patients registered for treatment	Annualized new smear positive case detection rate (%)	% 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	No of smear positive retreatment cases registered for treatment	No (%) of pediatric cases out of all New cases	3 month conversion rate of new smear positive patients ⁴	Cure rate of new smear positive patients ⁵	Treatment success rate of new smear positive patients ⁵
Daman & Diu																
Daman & Diu	Daman	1	2209	6%	230	179	76	59	55%	62	31	27	0	91%	82%	91%
Daman & Diu	Diu	0.5	811	8%	50	101	19	38	48%	8	9	13	1	79%	100%	100%
Delhi																
Delhi	BJRM Chest Clinic	4	4404	14%	1183	272	369	85	60%	246	256	189	130	92%	91%	91%
Delhi	DDU Chest Clinic	15	11791	16%	5012	330	1240	82	53%	1101	1579	568	521	88%	86%	86%
Delhi	GTB Chest Clinic	5	8531	17%	1632	301	542	100	70%	232	437	254	211	87%	88%	89%
Delhi	Gulabi Bagh	12	7639	13%	1921	161	603	51	62%	372	564	274	137	88%	87%	88%
Delhi	Hedgewar C Clinic	4	5284	18%	2213	510	617	142	67%	306	760	296	293	86%	83%	84%
Delhi	Jhandewalan	5	4716	15%	1367	252	387	71	62%	239	327	257	100	87%	85%	85%
Delhi	Karawal Nagar	7	6032	22%	3497	537	1091	168	62%	660	1012	452	432	87%	86%	86%
Delhi	Kingsway	5	7290	15%	1921	354	564	104	53%	504	506	287	191	92%	86%	87%
Delhi	LN Chest Clinic	5	6449	14%	1026	189	307	57	71%	127	287	138	90	89%	88%	88%
Delhi	LRS	15	9127	26%	4593	302	1301	86	58%	940	1226	713	550	91%	90%	90%
Delhi	Moti Nagar	5	7729	12%	1635	301	375	69	50%	371	567	161	218	92%	87%	87%
Delhi	Narela	7	7261	13%	1410	216	485	74	78%	263	320	292	164	86%	86%	86%
Delhi	NDMC	5	7078	16%	769	142	220	41	61%	138	222	126	66	91%	92%	92%
Delhi	NDTC														88%	88%
Delhi	Nehru Nagar	15	12368	16%	4255	280	1183	78	57%	877	1298	584	483	88%	85%	85%
Delhi	Patparganj	7	8632	18%	2614	373	847	121	65%	458	750	378	306	89%	82%	82%
Delhi	RK Mission	6	6229	16%	1757	292	534	89	57%	396	478	260	220	92%	91%	91%
Delhi	RTRM Chest Clinic	11	6575	14%	1574	145	492	45	48%	295	387	262	138	88%	87%	87%
Delhi	SGM Chest Clinic	14	16702	15%	5662	401	1536	109	55%	1272	1682	662	582	91%	87%	88%
Delhi	Shahdara	6	9217	18%	2283	386	641	108	60%	426	722	330	291	86%	84%	85%

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Delhi	SPM Marg	5	3678	17%	1282	260	383	78	82%	221	331	219	100	87%	87%	87%
Goa																
Goa	North Goa	9	7029	10%	1234	142	374	43	54%	340	301	141	70	85%	69%	70%
Goa	South Goa	7	3327	12%	802	120	263	39	49%	212	165	95	91	83%	71%	71%
Gujarat																
Gujarat	Ahmedabad	25	13314	19%	3263	131	1250	50	63%	660	443	617	136	91%	84%	84%
Gujarat	AMC	38	32071	17%	8614	226	2541	67	83%	1216	1771	1988	420	89%	86%	86%
Gujarat	Amreli	15	9138	13%	1675	111	819	54	68%	207	191	408	52	91%	86%	87%
Gujarat	Anand	20	12478	19%	3093	154	1298	65	81%	490	283	810	52	92%	89%	89%
Gujarat	Banas Kantha	27	16347	19%	4474	165	1525	56	70%	1018	316	1138	172	90%	79%	81%
Gujarat	Bharuch	20	12561	19%	2643	129	1422	70	87%	384	207	493	86	92%	88%	88%
Gujarat	Bhavnagar	27	15253	20%	3681	138	1470	55	69%	503	518	950	187	90%	87%	87%
Gujarat	Chhota Udepur	10	4570	22%	1258	128	667	68	85%	139	61	338	24	90%	87%	89%
Gujarat	Dahod *	18	16004	16%	3349	189	1517	86	107%	409	188	975	125	94%	86%	87%
Gujarat	Gandhinagar	14	9006	17%	1892	131	844	58	73%	252	205	436	61	91%	88%	88%
Gujarat	Jamnagar	21	13698	13%	2376	115	1155	56	70%	193	384	477	101	92%	88%	90%
Gujarat	Junagadh	27	16690	13%	3592	135	1655	62	78%	663	317	667	89	91%	86%	87%
Gujarat	Kachchh	17	8379	16%	1689	102	661	40	50%	204	150	519	25	87%	81%	81%
Gujarat	Kheda	22	10187	25%	3105	142	1391	63	79%	500	204	792	56	91%	86%	86%
Gujarat	Mahesana	20	13510	14%	2546	128	1204	60	76%	520	216	468	47	92%	88%	88%
Gujarat	Navsari	13	1841	16%	397	30	178	13	17%	49	62	81	13	4%		
Gujarat	Panch Mahals	22	15427	25%	4930	225	2344	107	134%	738	187	1299	88	93%	88%	88%
Gujarat	Patan	13	8904	17%	1743	136	743	58	73%	327	121	427	41	89%	85%	85%
Gujarat	Porbandar	6	625	18%	189	32	84	14	18%	47	12	21	7	5%		
Gujarat	Rajkot	34	22310	14%	3912	114	1986	58	73%	401	600	732	107	91%	87%	87%
Gujarat	Sabar Kantha	23	15917	17%	3807	169	1410	62	78%	880	288	858	107	92%	86%	86%
Gujarat	Surat	16	10411	17%	2203	134	949	58	72%	299	376	374	74	92%	88%	89%
Gujarat	Surat Municipal Corp	26	20440	13%	4392	167	1449	55	69%	624	1072	737	338	89%	87%	87%
Gujarat	Surendranagar	16	9920	18%	1979	121	865	53	66%	379	196	400	39	90%	87%	88%
Gujarat	The Dangs *	2	1314	11%	196	97	117	58	72%	35	8	17	14	9%	93%	96%
Gujarat	Vadodara	15	9256	17%	2126	138	940	61	76%	360	144	502	17	92%	85%	86%
Gujarat	Vadodara Corp	14	9497	22%	2127	150	852	60	75%	365	299	400	42	89%	86%	86%

(Contd.)

Annual Performance of Districts (Contd...)

State	District	Population (in lakh) covered by RNTCP ¹	No. of TB suspects examined	% of smear positive TB cases ² among suspects	Total patients registered for treatment ³	Annualized total case detection rate	New smear positive patients registered for treatment	Annualized new smear positive case detection rate (%)	% 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	No of smear positive retreatment cases registered for treatment	No (%) of pediatric cases out of all New cases	3 month conversion rate of new smear positive patients ⁴	Cure rate of new smear positive patients ⁵	Treatment success rate of new smear positive patients ⁵
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Gujarat	Valsad *	15	13759	15%	2892	189	1389	91	72%	547	328	466	131	6%	86%	86%
Gujarat	Vyara(Surat)	11	5646	21%	1678	148	876	77	72%	337	89	311	39	3%	85%	86%
Haryana																
Haryana	Ambala	11	12174	8%	1298	117	501	45	69%	230	248	230	40	4%	82%	83%
Haryana	Bhiwani	16	9210	20%	2656	171	1070	69	65%	578	212	650	77	4%	83%	85%
Haryana	Faridabad	22	12842	14%	3882	179	1238	57	53%	1119	703	621	147	5%	83%	85%
Haryana	Fatehabad	9	5492	17%	1163	132	514	58	68%	241	102	256	23	3%	80%	81%
Haryana	Gurgaon	11	11548	15%	2355	217	902	83	73%	339	416	572	133	8%	76%	79%
Haryana	Hisar	17	9855	21%	2163	129	975	58	73%	355	203	509	149	10%	79%	80%
Haryana	Jhajjar	10	4544	14%	1499	155	554	57	65%	301	276	313	48	4%	83%	85%
Haryana	Jind	13	9324	15%	2009	155	795	61	73%	292	270	536	81	6%	85%	85%
Haryana	Kaithal **	10	5553	16%	1510	146	595	58	68%	285	175	359	29	3%	78%	80%
Haryana	Karnal	14	10556	14%	1949	140	865	62	67%	426	220	375	69	5%	86%	87%
Haryana	Kurukshetra	9	7200	10%	1097	121	401	44	62%	242	204	176	58	7%	80%	80%
Haryana	Mahendragarh	9	6022	13%	1339	151	481	54	61%	312	204	277	74	7%	82%	83%
Haryana	Mewat**	10	2410	21%	736	77	294	31	70%	126	76	213	51	10%	89%	
Haryana	Panchkula	5	4108	12%	825	161	271	53	63%	156	203	123	48	8%	88%	88%
Haryana	Panipat	11	6156	15%	1967	186	597	56	51%	577	208	333	62	4%	82%	83%
Haryana	Rewari	8	3872	16%	1022	122	378	45	48%	195	143	236	40	6%	77%	79%
Haryana	Rohtak	10	17813	10%	1867	182	663	65	68%	308	426	393	117	8%	88%	88%
Haryana	Sirsa	12	7048	19%	1692	139	761	63	80%	187	189	452	57	5%	81%	82%
Haryana	Sompat	14	6822	14%	2344	168	711	51	46%	837	314	346	78	4%	83%	85%
Haryana	Yamunanagar	11	6769	13%	1320	123	589	55	68%	282	169	216	14	1%	82%	83%

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Himachal Pradesh																
Himachal Pradesh	Bilaspur-HP	4	3741	13%	726	202	331	92	68%	155	64	163	0	91%	88%	90%
Himachal Pradesh	Chamba	5	3687	17%	1197	246	407	84	88%	208	268	286	20	89%	83%	87%
Himachal Pradesh	Hamirpur-HP **	4	4402	10%	729	167	298	68	72%	120	169	115	12	94%	88%	89%
Himachal Pradesh	Kangra	14	10070	17%	2505	177	964	68	72%	490	543	421	13	91%	88%	90%
Himachal Pradesh	Kinnaur *	1	669	11%	186	210	60	68	71%	43	36	33	3	84%	81%	91%
Himachal Pradesh	Kullu	4	5231	15%	1475	367	490	122	128%	309	316	307	50	91%	87%	87%
Himachal Pradesh	Lahul & Spiti *	0.4	760	4%	132	376	20	57	60%	53	40	9	7	84%	84%	88%
Himachal Pradesh	Mandi	10	9029	13%	2058	216	783	82	87%	351	401	460	19	92%	89%	91%
Himachal Pradesh	Shimla	8	6911	16%	1700	223	584	77	81%	273	463	291	37	94%	88%	89%
Himachal Pradesh	Sirmaur	5	4881	11%	917	189	340	70	74%	131	188	216	27	92%	84%	88%
Himachal Pradesh	Solan	5	7899	12%	1015	192	428	81	85%	148	199	188	36	91%	88%	89%
Himachal Pradesh	Una	5	3790	11%	663	140	260	55	58%	133	91	150	5	92%	86%	86%
Jammu & Kashmir																
Jammu & Kashmir	Anantanag	13	7661	4%	589	44	256	19	20%	66	186	35	10	87%	81%	83%
Jammu & Kashmir	Badgam	7	6951	3%	409	60	203	30	31%	69	110	21	10	93%	95%	95%
Jammu & Kashmir	Baramula	13	6991	7%	926	69	410	30	32%	160	241	81	18	92%	90%	90%
Jammu & Kashmir	Doda	8	4243	12%	1016	128	368	46	49%	224	258	126	38	79%	74%	77%
Jammu & Kashmir	Jammu	18	9841	14%	2059	114	594	33	35%	748	380	293	19	76%	73%	78%
Jammu & Kashmir	Kargil *	1	908	6%	142	107	42	32	33%	72	37	14	2	80%	67%	67%
Jammu & Kashmir	Kathua	6	4310	11%	1048	167	303	48	51%	389	141	142	19	85%	74%	76%
Jammu & Kashmir	Kupwara	7	5305	4%	578	78	232	31	33%	133	188	13	18	93%	85%	85%
Jammu & Kashmir	Leh *	1	889	5%	161	119	45	33	35%	25	76	14	2	82%	57%	57%
Jammu & Kashmir	Poonch	4	2257	8%	463	108	155	36	38%	145	116	26	23	89%	83%	83%
Jammu & Kashmir	Pulwama	7	5007	4%	460	63	196	27	28%	107	113	26	18	94%	88%	88%
Jammu & Kashmir	Rajouri	6	3614	9%	604	110	244	44	47%	92	182	62	9	83%	76%	76%
Jammu & Kashmir	Srinagar	14	7829	5%	827	58	263	18	19%	154	317	65	15	92%	90%	90%
Jammu & Kashmir	Udhampur	9	6605	7%	986	116	324	38	40%	233	229	163	18	92%	81%	82%
Jharkhand																
Jharkhand	Bokaro	19	9210	14%	2508	130	1000	52	69%	975	173	188	62	91%	86%	87%
Jharkhand	Chatra **	9	1986	21%	800	93	341	40	53%	338	11	67	0	64%	68%	68%
Jharkhand	Deoghar **	13	6341	13%	1172	93	566	45	60%	347	54	137	40	92%	88%	91%

(Contd.)

Annual Performance of Districts (Contd...)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
State	District	Population (in lakh) covered by RNTCP ¹	No. of TB suspects examined	% of smear positive TB cases ² among suspects	Total patients registered for treatment ³	Annualized total case detection rate	New smear positive patients registered for treatment	Annualized new smear positive case detection rate (%)	% 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	No of smear positive retreatment cases registered for treatment	No (%) of pediatric cases out of all New cases	3 month conversion rate of new smear positive patients ⁴	Cure rate of new smear positive patients ⁵	Treatment success rate of new smear positive patients ⁵
Jharkhand	Dhanbad	26	8693	15%	2448	94	1044	40	54%	943	73	210	92	93%	85%	89%
Jharkhand	Dumka **	12	5138	21%	1935	162	787	66	88%	781	14	171	14	83%	74%	88%
Jharkhand	Garhwa	11	4377	15%	1401	125	507	45	60%	554	70	152	92	93%	72%	85%
Jharkhand	Giridih **	21	6253	21%	2156	105	887	43	57%	838	56	334	60	94%	86%	88%
Jharkhand	Godda **	11	3460	17%	995	88	515	45	60%	363	11	57	15	83%	87%	87%
Jharkhand	Gumla †	9	3019	12%	830	93	320	36	48%	362	21	36	23	92%	87%	89%
Jharkhand	Hazaribagh **	25	7200	14%	1936	78	821	33	44%	778	98	148	88	86%	79%	89%
Jharkhand	Jamtara **	7	3740	14%	949	134	430	61	81%	293	19	82	28	92%	86%	89%
Jharkhand	Kodarma **	5	1032	16%	288	53	98	18	24%	94	12	56	9	62%	43%	79%
Jharkhand	Latihar **	6	3065	17%	855	136	424	67	90%	261	54	83	72	84%	84%	91%
Jharkhand	Lohardaga *	4	1720	16%	433	110	212	54	72%	98	49	50	40	83%	85%	86%
Jharkhand	Pakaur **	8	4197	16%	839	110	402	53	70%	263	17	96	16	88%	81%	81%
Jharkhand	Palamu **	16	9443	14%	2458	150	1013	62	82%	942	274	182	185	94%	91%	93%
Jharkhand	Pasthimi Singhbhum*	14	4008	21%	1723	122	720	51	68%	812	76	66	31	90%	84%	85%
Jharkhand	Purbi Singhbhum †	21	7382	24%	2718	127	1232	57	77%	833	233	306	74	88%	78%	84%
Jharkhand	Ranchi †	30	12463	16%	3830	127	1520	50	67%	1270	576	248	199	84%	83%	87%
Jharkhand	Sahibganj **	10	4655	13%	1293	129	461	46	61%	624	44	69	13	83%	79%	82%
Jharkhand	Saraikela-Kharsawan**	8	3211	15%	900	107	424	50	67%	323	34	64	13	88%	72%	84%
Jharkhand	Simdega **	6	1839	19%	568	101	300	53	71%	173	21	55	9	80%	69%	71%
Karnataka																
Karnataka	Bagalkot	18	11277	9%	1744	99	706	40	54%	522	168	284	71	82%	73%	77%
Karnataka	Bangalore City	44	38844	14%	7058	159	2182	49	66%	1280	2010	1014	490	72%	65%	67%

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Karnataka	Bangalore Rural	20	9982	10%	2232	112	882	44	59%	524	440	286	96	5%	83%	84%
Karnataka	Bangalore U	25	8168	11%	3086	123	1058	42	56%	615	829	407	179	7%	85%	87%
Karnataka	Belgaum	45	24189	10%	4225	94	1739	39	52%	1198	701	402	340	9%	84%	81%
Karnataka	Bellary	22	15753	17%	3241	150	1430	66	88%	797	505	455	218	8%	77%	77%
Karnataka	Bidar **	16	5681	13%	1304	82	490	31	41%	363	99	289	11	1%	72%	73%
Karnataka	Bijapur	19	8421	15%	2122	110	708	37	49%	677	216	357	89	6%	66%	69%
Karnataka	Chamarajanagar	10	7413	11%	1492	145	643	63	84%	290	244	263	89	8%	81%	82%
Karnataka	Chikmagalur	12	8996	7%	1124	93	423	35	47%	237	268	147	51	5%	86%	86%
Karnataka	Chitradurga	16	9675	13%	2127	132	1009	63	84%	609	245	216	66	4%	80%	80%
Karnataka	Dakshina Kannada	20	12955	12%	2186	108	907	45	60%	357	383	364	53	3%	79%	80%
Karnataka	Davanagere	19	9493	16%	2393	126	890	47	62%	630	445	265	69	4%	80%	81%
Karnataka	Dharwad	17	11668	13%	2084	122	707	41	55%	323	636	302	81	5%	79%	80%
Karnataka	Gadag	10	5722	17%	1095	106	449	43	58%	198	147	239	45	6%	67%	68%
Karnataka	Gulbarga **	33	14927	13%	3160	95	1151	35	46%	1000	216	580	109	5%	68%	70%
Karnataka	Hassan	18	12589	7%	1683	92	707	39	51%	348	337	193	41	3%	83%	83%
Karnataka	Haveri	15	8943	9%	1574	103	632	41	55%	406	221	258	41	3%	76%	81%
Karnataka	Kodagu	6	4295	6%	440	76	174	30	40%	100	112	29	15	4%	87%	87%
Karnataka	Kolar	27	18875	12%	3276	122	1527	57	76%	686	532	458	143	5%	80%	82%
Karnataka	Koppal	13	7236	16%	1630	128	759	60	80%	347	130	310	68	6%	77%	80%
Karnataka	Mandya	19	17331	9%	2550	136	1072	57	76%	459	516	388	111	5%	85%	85%
Karnataka	Mysore	28	23732	11%	3513	126	1390	50	66%	794	649	537	160	6%	80%	82%
Karnataka	Raichur	18	10825	16%	2579	147	1082	62	82%	721	168	476	118	6%	83%	83%
Karnataka	Shimoga	17	9873	8%	1661	95	510	29	39%	714	248	158	81	6%	84%	84%
Karnataka	Tumkur	27	15044	13%	2984	109	1303	47	63%	548	597	399	139	6%	82%	82%
Karnataka	Udupi	12	8717	9%	1187	101	457	39	52%	216	219	205	80	9%	82%	82%
Karnataka	Uttara Kannada	14	4352	11%	1092	76	376	26	35%	359	139	131	24	3%	61%	74%
Kerala																
Kerala	Alappuzha	22	16768	5%	1941	87	701	32	42%	709	353	140	369	21%	87%	84%
Kerala	Ernakulam	33	20202	7%	2592	79	1057	32	43%	656	459	321	211	10%	80%	83%
Kerala	Idukki	12	7472	4%	600	50	251	21	28%	112	186	32	22	4%	80%	80%
Kerala	Kannur	25	17032	6%	1891	74	810	32	42%	293	541	175	47	3%	82%	84%
Kerala	Kasaragod	13	6945	8%	938	74	438	35	46%	158	198	115	35	4%	81%	83%

(Contd.)

Annual Performance of Districts (Contd...)

State	District	Population (in lakh) covered by RNTCP ¹	No. of TB suspects examined	% of smear positive TB cases ² among suspects	Total patients registered for treatment ³	Annualized total case detection rate	New smear positive patients registered for treatment	Annualized new smear positive case detection rate (%)	% new sputum positive out of total pulmonary cases	No of new smear negative cases registered for treatment	No of new EP cases registered for treatment	No of smear positive retreatment cases registered for treatment	No (%) of pediatric cases out of all New cases	3 month conversion rate of new smear positive patients ⁴	Cure rate of new smear positive patients ⁵	Treatment success rate of new smear positive patients ⁵
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Kerala	Kollam	27	16506	6%	2031	75	889	33	62%	534	395	159	141	8%	85%	86%
Kerala	Kottayam	21	22972	5%	1746	85	851	41	75%	281	403	174	83	5%	79%	81%
Kerala	Kozhikode	30	20933	6%	2503	82	930	31	64%	531	754	213	230	10%	81%	83%
Kerala	Malappuram	38	18110	6%	2163	57	886	23	64%	506	545	175	32	2%	85%	87%
Kerala	Palakkad	28	14404	8%	2056	75	965	35	77%	291	542	217	126	7%	81%	83%
Kerala	Pathanamthitta	13	7592	7%	873	67	448	35	78%	126	214	70	17	2%	85%	87%
Kerala	Thiruvananthapuram	34	31746	5%	2668	78	1074	31	63%	641	598	238	293	13%	82%	84%
Kerala	Thrissur	31	23269	6%	2559	82	1127	36	73%	411	677	269	162	7%	83%	85%
Kerala	Wayanad	8	5741	6%	687	83	280	34	59%	198	149	55	162	26%	81%	84%
Lakshadweep																
Lakshadweep	Lakshadweep *	1	189	3%	16	24	7	11	14%	6	3	0	0	0%	100%	100%
Madhya Pradesh																
Madhya Pradesh	Balaghat **	16	3414	17%	1128	71	420	26	33%	378	119	163	25	3%	83%	89%
Madhya Pradesh	Barwani †	12	5634	13%	878	73	428	36	69%	193	76	160	20	3%	77%	82%
Madhya Pradesh	Betul **	15	5153	13%	946	61	437	28	35%	249	97	147	2	0%	63%	73%
Madhya Pradesh	Bhind	16	5272	21%	1702	108	662	42	51%	626	99	283	62	4%	67%	70%
Madhya Pradesh	Bhopal	20	15689	18%	3141	155	991	49	44%	1246	341	342	123	5%	89%	89%
Madhya Pradesh	Cihatarpur **	16	6725	12%	1854	114	394	24	30%	803	53	374	3	0%	69%	76%
Madhya Pradesh	Chhindwara **	20	7559	18%	1543	75	786	38	48%	247	220	264	65	5%	81%	83%
Madhya Pradesh	Damoh **	12	5280	21%	1711	143	799	67	83%	442	152	275	24	2%	78%	83%
Madhya Pradesh	Datia	7	3425	21%	1063	153	448	65	81%	304	82	198	64	8%	82%	90%
Madhya Pradesh	Dewas	14	4733	13%	1375	95	501	35	43%	541	179	122	79	6%	86%	86%
Madhya Pradesh	Dhar †	19	8060	13%	1932	100	761	40	49%	691	173	266	22	1%	84%	89%
Madhya Pradesh	Dindori †	6	1745	15%	356	56	215	34	42%	89%	46	63	7	2%	69%	72%

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Madhya Pradesh	Guna	18	6692	18%	1792	97	824	45	56%	516	140	260	17	1%	81%	85%
Madhya Pradesh	Gwalior	18	11218	21%	2674	148	1104	61	77%	600	263	670	105	5%	79%	79%
Madhya Pradesh	Harda **	5	1472	13%	382	73	139	26	33%	146	38	50	11	3%	75%	75%
Madhya Pradesh	Hoshangabad **	12	7530	14%	1882	157	673	56	70%	665	228	265	84	5%	92%	93%
Madhya Pradesh	Indore	29	16833	13%	3602	126	1320	46	58%	704	796	570	179	6%	82%	83%
Madhya Pradesh	Jabalpur	24	8670	25%	2750	115	1215	51	63%	515	350	534	157	8%	66%	74%
Madhya Pradesh	Jhabua †	15	6028	15%	1577	102	731	47	59%	536	89	178	22	2%	83%	89%
Madhya Pradesh	Katni	12	4388	26%	1778	151	834	71	89%	640	102	202	76	5%	76%	85%
Madhya Pradesh	Khandwa **	19	7586	15%	1942	103	863	46	57%	693	174	178	62	4%	88%	89%
Madhya Pradesh	Khargone **	17	6404	16%	1999	118	712	42	53%	692	267	281	83	5%	84%	84%
Madhya Pradesh	Mandla †	10	4369	17%	1046	106	524	53	66%	211	136	143	35	4%	72%	84%
Madhya Pradesh	Mandsaur	13	5506	20%	1886	144	663	51	63%	632	163	366	16	1%	84%	89%
Madhya Pradesh	Morena	18	6528	21%	2024	115	674	38	48%	403	101	640	51	4%	63%	70%
Madhya Pradesh	Narsinghpur **	11	2709	19%	882	83	334	32	39%	216	91	185	20	3%	68%	71%
Madhya Pradesh	Neemuch	8	6565	10%	1284	160	485	60	76%	424	132	172	48	5%	87%	88%
Madhya Pradesh	Panna **	9	2508	25%	980	104	387	41	51%	267	45	212	18	3%	76%	81%
Madhya Pradesh	Raisen **	12	3757	14%	1406	113	365	29	37%	669	79	148	21	2%	85%	86%
Madhya Pradesh	Rajgarh	14	4761	18%	1752	126	568	41	51%	635	118	235	20	2%	84%	85%
Madhya Pradesh	Ratlam	13	5045	19%	1454	108	494	37	46%	410	174	237	23	2%	75%	80%
Madhya Pradesh	Rewa	22	9374	14%	2748	126	825	38	47%	936	431	455	148	7%	78%	79%
Madhya Pradesh	Sagar **	22	9080	18%	2723	122	1170	52	65%	980	191	371	129	6%	82%	86%
Madhya Pradesh	Satna	21	6289	20%	2583	125	875	42	53%	1003	272	228	16	1%	87%	88%
Madhya Pradesh	Sehore **	12	3668	13%	1262	106	395	33	41%	626	111	82	32	3%	83%	85%
Madhya Pradesh	Seoni **	13	2981	20%	757	59	394	31	38%	81	94	181	17	3%	74%	75%
Madhya Pradesh	Shahdol	17	4364	20%	1356	78	641	37	46%	433	68	143	10	1%	84%	85%
Madhya Pradesh	Shajapur	14	5678	14%	1288	90	500	35	44%	325	100	279	14	2%	93%	93%
Madhya Pradesh	Sheopur	6	3093	26%	1114	180	549	89	111%	270	33	224	21	2%	60%	71%
Madhya Pradesh	Shivpuri	16	5905	20%	1845	116	913	57	72%	661	43	189	10	1%	83%	84%
Madhya Pradesh	Sidhi	20	7091	14%	1736	86	760	38	47%	446	183	295	36	3%	82%	84%
Madhya Pradesh	Tikamgarh **	13	2957	19%	1050	79	417	31	39%	409	76	133	18	2%	77%	79%
Madhya Pradesh	Ujjain	19	8040	19%	2068	109	851	45	56%	552	263	358	65	4%	84%	87%
Madhya Pradesh	Umaria	6	1431	18%	481	84	186	33	41%	169	53	63	28	7%	79%	82%

(Contd.)

Annual Performance of Districts (Contd...)

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Madhya Pradesh	Vidisha **	13	6458	14%	2703	201	657	49	34%	1255	151	396	210	89%	84%	88%
Maharashtra																
Maharashtra	Ahmadnagar	44	20501	11%	4531	103	2108	48	61%	1351	522	275	204	91%	87%	87%
Maharashtra	Akola	18	8392	14%	1842	105	830	47	59%	442	248	264	64	92%	85%	89%
Maharashtra	Amravati Mun Corp	6	5342	11%	807	137	298	50	63%	173	152	109	29	86%	82%	84%
Maharashtra	Amravati Rural	22	13196	10%	2435	110	891	40	56%	691	316	313	36	89%	84%	86%
Maharashtra	Aurangabad Muni Corp	9	6592	13%	1096	117	395	42	53%	177	306	145	53	88%	86%	86%
Maharashtra	Aurangabad-MH **	22	8705	15%	2270	103	1132	51	64%	694	217	174	66	93%	89%	91%
Maharashtra	Bhandara	12	8656	11%	1409	115	620	51	63%	476	72	199	90	92%	88%	89%
Maharashtra	Bid **	23	11461	11%	2132	92	1120	48	60%	526	247	160	86	92%	86%	86%
Maharashtra	Buldana **	24	15760	16%	3025	126	1286	54	67%	932	223	498	92	92%	87%	89%
Maharashtra	Chandrapur	22	11950	12%	2855	128	1174	53	66%	858	352	295	96	92%	88%	90%
Maharashtra	Dhule	18	11949	12%	2369	129	1024	56	70%	725	304	198	102	91%	86%	87%
Maharashtra	Gadchiroli **	10	6199	13%	1257	120	608	58	73%	340	169	95	38	91%	84%	91%
Maharashtra	Gondiya	13	8613	11%	1652	128	729	56	71%	426	189	216	79	90%	88%	88%
Maharashtra	Hingoli **	11	3634	15%	1441	136	513	48	60%	563	120	159	54	86%	82%	88%
Maharashtra	Jalgaon	40	20781	11%	4632	117	2004	51	63%	1720	455	393	201	92%	87%	87%
Maharashtra	Jalna **	17	11636	9%	2075	120	765	44	55%	784	173	272	39	87%	83%	88%
Maharashtra	Kalyan Dombivli MC	13	5417	18%	1675	130	653	51	64%	371	334	225	26	91%	81%	81%
Maharashtra	Kolhapur	33	14002	11%	2930	90	1320	40	51%	814	416	216	122	89%	83%	84%
Maharashtra	Kolhapur Mun Corp	5	1885	9%	538	103	170	33	41%	162	100	68	23	83%	77%	88%
Maharashtra	Latur **	22	11023	11%	2213	99	1104	49	62%	720	190	155	57	91%	87%	88%
Maharashtra	Mumbai	128	80706	18%	25465	199	7882	61	77%	6752	4915	3400	1999	90%	85%	85%

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Maharashtra	Nagpur Muni Corp	22	14873	17%	3440	156	1254	57	71%	519	1034	462	113	4%	85%	85%
Maharashtra	Nagpur Rural	22	10340	12%	2731	127	1418	66	82%	874	133	227	22	1%	90%	91%
Maharashtra	Nanded **	26	14318	13%	3280	125	1348	51	64%	1064	419	325	125	4%	88%	90%
Maharashtra	Nanded Waghele MC	5	1884	18%	667	144	255	55	69%	166	129	74	6	1%	84%	84%
Maharashtra	Nandurbar *	14	7494	12%	1686	120	689	49	61%	638	150	159	12	1%	82%	87%
Maharashtra	Nashik	42	24496	12%	5753	137	2511	60	75%	1975	776	358	837	16%	90%	90%
Maharashtra	Nashik Corp	12	5275	13%	1277	110	499	43	54%	312	275	135	74	7%	84%	84%
Maharashtra	Navi Mumbai	8	7440	16%	1684	222	523	69	86%	322	348	246	226	19%	82%	82%
Maharashtra	Osmanabad **	16	7379	10%	1299	82	601	38	47%	383	131	136	62	6%	88%	88%
Maharashtra	Parbhani **	16	6241	15%	1721	107	654	41	51%	634	176	220	61	4%	86%	86%
Maharashtra	Pimpri Chinchwad	11	7826	14%	2010	186	680	63	78%	412	507	242	88	6%	85%	85%
Maharashtra	Pune	27	10976	14%	3891	142	1370	50	63%	796	1008	388	114	4%	86%	86%
Maharashtra	Pune Rural	40	25782	12%	4377	111	1889	48	60%	924	671	581	81	2%	88%	88%
Maharashtra	Raigarh-MH	24	12405	14%	3368	142	1272	54	67%	979	433	406	78	3%	85%	85%
Maharashtra	Ratnagiri	18	10116	12%	2707	148	943	52	65%	889	219	317	50	2%	84%	85%
Maharashtra	Sangli	23	14979	10%	2588	112	1164	50	63%	636	343	195	107	5%	83%	84%
Maharashtra	Sangli Muni Corp	5	1899	15%	782	166	211	45	56%	202	196	65	56	9%	86%	86%
Maharashtra	Satara	30	19832	8%	4391	146	1270	42	53%	1746	544	393	148	4%	80%	85%
Maharashtra	Sindhudurg	9	6666	8%	1268	137	384	41	52%	456	141	138	41	4%	79%	82%
Maharashtra	Solapur	32	19141	9%	2752	86	1500	47	58%	716	228	217	53	2%	86%	87%
Maharashtra	Solapur Muni Corp	9	7229	14%	1366	145	523	56	70%	376	171	159	33	3%	83%	83%
Maharashtra	Thane	48	25234	14%	6942	143	2870	59	74%	1916	939	737	400	7%	89%	89%
Maharashtra	Thane Muni Corp	14	8208	19%	2850	210	810	60	75%	562	685	442	226	11%	81%	81%
Maharashtra	Ulhasnagar Muni Corp	5	3366	21%	889	175	288	57	71%	304	75	135	12	2%	79%	79%
Maharashtra	Wardha	13	7528	12%	1858	140	755	57	71%	571	318	189	98	6%	86%	88%
Maharashtra	Washim	11	3127	16%	1222	111	490	45	56%	370	154	147	21	2%	86%	86%
Maharashtra	Yavatmal **	26	13056	14%	3389	128	1296	49	61%	1108	435	434	125	4%	86%	86%
Manipur																
Manipur	Bishnupur	2	920	12%	361	164	101	46	61%	105	70	33	7	3%	84%	86%
Manipur	Chandel *	1	946	6%	239	182	63	48	44%	81	36	19	12	7%	88%	89%
Manipur	Churachandpur *	2	6962	2%	985	402	155	63	84%	350	169	62	151	22%	82%	82%
Manipur	Imphal East	4	2103	13%	783	185	185	44	58%	315	139	48	16	3%	79%	79%

(Contd.)

Annual Performance of Districts (Contd...)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
State	District	Population (in lakh) covered by RNTCP ¹	No. of TB suspects examined	% of smear positive TB cases ² among suspects	Total patients registered for treatment ³	Annualized total case detection rate	New smear positive patients registered for treatment	Annualized new smear positive case detection rate (%)	% 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	No of smear positive re-treatment cases registered for treatment	No (%) of pediatric cases out of all New cases	3 month conversion rate of new smear positive patients ⁴	Cure rate of new smear positive patients ⁵	Treatment success rate of new smear positive patients ⁵
Manipur	Imphal West	5	4716	9%	918	195	274	58	47%	304	215	65	31	4%	92%	90%
Manipur	Senapati *	4	1293	10%	423	104	134	33	54%	115	81	49	35	11%	90%	83%
Manipur	Tamenglong *	1	465	10%	79	66	38	32	73%	14	10	11	3	5%	75%	80%
Manipur	Thoubal	4	1078	15%	614	156	128	33	43%	262	111	36	9	2%	89%	91%
Manipur	Ukhrul *	2	676	12%	201	133	63	42	62%	38	40	32	12	9%	72%	77%
Meghalaya																
Meghalaya	East Garo Hills *	3	926	10%	181	68	71	27	62%	44	20	19	8	6%	93%	81%
Meghalaya	East Khasi Hills *	7	3189	21%	1760	248	350	49	49%	365	472	293	118	10%	78%	73%
Meghalaya	Jaintia Hills *	3	939	19%	335	106	105	33	57%	79	72	50	4	2%	79%	86%
Meghalaya	Ri Bhoi *	2	1170	13%	303	147	116	56	70%	49	48	54	16	8%	74%	65%
Meghalaya	South Garo Hills *	1	302	14%	86	81	47	44	84%	9	12	12	4	6%	98%	85%
Meghalaya	West Garo Hills *	6	3520	14%	730	132	375	68	69%	168	57	78	28	5%	86%	88%
Meghalaya	West Khasi Hills *	3	1536	13%	534	169	156	49	54%	132	134	61	68	16%	89%	88%
Mizoram																
Mizoram	Aizawl *	4	3422	11%	978	269	229	63	84%	210	360	100	41	5%	95%	89%
Mizoram	Champhai *	1	794	4%	119	110	28	26	51%	27	44	6	8	8%	91%	93%
Mizoram	Kolasib *	1	799	10%	164	251	47	72	41%	68	25	17	7	5%	91%	93%
Mizoram	Lawngtlai *	1	355	10%	111	142	36	46	61%	27	23	17	2	2%	82%	96%
Mizoram	Lunglei *	1	1198	14%	278	189	130	88	71%	52	63	30	5	2%	91%	91%
Mizoram	Mamit *	1	360	6%	53	79	21	31	42%	15	11	6	3	6%	89%	88%
Mizoram	Saita *	1	522	7%	139	213	33	51	67%	29	45	14	5	5%	100%	95%
Mizoram	Serchhip *	1	385	7%	70	118	24	40	53%	21	20	3	11	17%	100%	92%
Nagaland																
Nagaland	Dimapur *	3	1618	18%	735	222	252	76	102%	229	29	96	24	5%	93%	83%

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Nagaland	Kohima *	3	1506	9%	394	117	121	36	48%	56%	96	52	24	8%	83%	87%
Nagaland	Mokokchung *	2	1055	8%	227	93	86	35	47%	66%	44	59	7	5%	80%	80%
Nagaland	Mon *	3	1470	17%	382	137	164	59	79%	77%	49	60	41	13%	93%	93%
Nagaland	Phek *	2	591	10%	120	76	42	26	35%	74%	15	43	16	16%	88%	89%
Nagaland	Tuensang *	4	2228	8%	614	138	184	41	55%	53%	166	57	77	15%	87%	87%
Nagaland	Wokha *	2	505	46%	118	68	75	43	58%	77%	23	4	0	0%	88%	88%
Nagaland	Zunheboto *	2	497	10%	105	63	35	21	28%	64%	20	22	0	0%	94%	94%
Orissa																
Orissa	Anugul	12	7420	10%	1130	93	558	46	54%	70%	236	179	48	5%	89%	90%
Orissa	Balangir **	14	7247	14%	2123	149	782	55	65%	46%	903	272	75	4%	88%	91%
Orissa	Baleshwar	22	7727	11%	1502	70	625	29	34%	57%	476	172	21	2%	81%	84%
Orissa	Bargarh	14	3902	16%	1366	95	606	42	50%	62%	378	251	22	2%	79%	86%
Orissa	Boudh	4	1863	13%	433	109	250	63	74%	78%	70	52	24	6%	86%	89%
Orissa	Bhadrak	14	3899	11%	850	60	356	25	30%	64%	198	196	18	2%	82%	87%
Orissa	Bhubaneswar Corp	7	2884	19%	564	82	233	34	40%	80%	60	167	11	2%	81%	83%
Orissa	Cuttack	25	8676	17%	1773	71	715	29	34%	73%	271	468	66	5%	61%	77%
Orissa	Debagarh	3	1213	10%	230	79	111	38	45%	61%	72	27	5	2%	91%	91%
Orissa	Dhenkanal	11	4594	12%	1080	95	453	40	47%	57%	335	151	34	4%	84%	89%
Orissa	Gajapati †	6	2796	19%	884	160	431	78	92%	63%	250	116	70	9%	72%	76%
Orissa	Ganjam	33	14800	18%	4977	149	1964	59	69%	59%	1343	787	189	5%	68%	77%
Orissa	Jagatsinghapur	11	4043	7%	460	41	226	20	24%	76%	73	106	6	1%	92%	92%
Orissa	Jajapur	17	4965	11%	1307	76	541	31	37%	64%	303	315	30	3%	88%	92%
Orissa	Jharsuguda	5	3997	10%	874	161	336	62	73%	56%	265	153	30	4%	89%	90%
Orissa	Kalahandi **	14	7268	20%	2131	150	1117	79	93%	69%	511	298	75	4%	71%	82%
Orissa	Kandhamal †	7	4300	14%	757	110	429	62	73%	80%	104	129	39	6%	64%	86%
Orissa	Kendrapara	14	4611	8%	818	59	325	23	28%	63%	189	150	15	2%	92%	93%
Orissa	Kendujhar	17	11105	13%	2490	150	1107	67	78%	62%	676	413	62	3%	88%	89%
Orissa	Khordha	13	4588	9%	1154	88	378	29	34%	48%	410	187	40	4%	84%	87%
Orissa	Koraput †	13	5754	19%	1330	106	745	59	70%	81%	180	193	34	3%	63%	78%
Orissa	Malkangiri *	5	4730	12%	1099	215	583	114	134%	66%	301	70	34	4%	74%	78%
Orissa	Mayurbhanj †	24	14953	17%	4575	194	2172	92	108%	60%	1455	555	86	2%	89%	91%
Orissa	Nabarangapur †	11	3627	17%	1009	93	509	47	55%	62%	313	61	21	2%	84%	87%

(Contd.)

Annual Performance of Districts (Contd...)

State	District	Population (in lakh) covered by RNTCP ¹	No. of TB suspects examined	% of smear positive TB cases ² among suspects	Total patients registered for treatment ³	Annualized total case detection rate	New smear positive patients registered for treatment	Annualized new smear positive case detection rate (%)	% 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	No of smear positive retreatment cases registered for treatment	No (%) of pediatric cases out of all New cases	3 month conversion rate of new smear positive patients ⁴	Cure rate of new smear positive patients ⁵	Treatment success rate of new smear positive patients ⁵
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Orissa	Nayagarh	9	5323	13%	1562	170	423	46	43%	563	206	172	101	66%	73%	76%
Orissa	Nuapada †	6	2561	16%	871	154	323	57	44%	417	28	70	17	76%	64%	91%
Orissa	Puri	16	5675	12%	1259	79	499	31	71%	204	262	131	48	89%	73%	87%
Orissa	Rayagada †	9	6154	15%	1328	152	754	86	101%	323	124	97	74	89%	82%	86%
Orissa	Sambalpur	10	6978	11%	1305	132	529	54	60%	352	292	95	91	87%	85%	87%
Orissa	Sonapur	6	2168	11%	566	98	241	42	49%	189	62	43	24	89%	73%	85%
Orissa	Sundargarh †	19	13469	14%	2983	153	1342	69	81%	926	422	178	76	92%	81%	88%
Puducherry																
Puducherry	Puducherry	10	16477	9%	1513	145	666	64	68%	311	286	222	21	85%	73%	78%
Punjab																
Punjab	Amritsar	33	15792	19%	5162	157	2010	61	64%	1056	1287	650	302	85%	77%	82%
Punjab	Bathinda	13	8863	13%	1771	140	706	56	59%	390	268	313	59	90%	88%	88%
Punjab	Faridkot	6	3989	16%	959	162	382	65	68%	193	176	160	39	84%	84%	85%
Punjab	Fatehgarh Sahib	6	3041	11%	650	113	268	46	49%	91	166	101	38	85%	80%	80%
Punjab	Firozpur	19	6104	19%	1886	101	686	37	39%	465	216	423	72	84%	72%	77%
Punjab	Gurdaspur	22	11435	13%	2462	110	1041	46	49%	543	365	421	76	88%	84%	86%
Punjab	Hoshiarpur	16	12788	10%	2008	127	860	54	57%	503	252	332	64	92%	85%	86%
Punjab	Jalandhar	21	11519	13%	2527	121	1023	49	52%	454	606	380	153	80%	69%	78%
Punjab	Kapurthala	8	4459	13%	859	107	414	51	54%	168	148	108	22	89%	81%	83%
Punjab	Ludhiana	32	18807	13%	4850	150	1620	50	53%	1680	939	423	286	91%	87%	89%
Punjab	Mansa-PJ	7	4385	14%	983	133	434	59	62%	205	141	148	28	92%	84%	84%
Punjab	Moga	9	4450	14%	961	101	459	48	51%	160	130	164	52	84%	81%	81%
Punjab	Muktsar	8	4944	17%	1163	140	533	64	68%	248	94	275	36	87%	81%	83%
Punjab	Nawanshahr	6	4371	11%	776	124	376	60	63%	140	121	111	24	93%	81%	89%

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Punjab	Patiala	20	17916	14%	3417	174	1269	65	68%	612	826	544	268	10%	81%	85%
Punjab	Rupnagar	12	9094	10%	1530	129	590	50	52%	257	334	266	77	7%	83%	86%
Punjab	Sangrur	21	12806	10%	2573	120	959	45	47%	753	355	358	84	4%	83%	88%
Rajasthan																
Rajasthan	Ajmer	24	15979	24%	5514	229	1779	74	92%	1470	763	1302	180	4%	85%	86%
Rajasthan	Alwar	33	14528	17%	4883	148	1680	51	64%	1705	611	773	134	3%	86%	88%
Rajasthan	Banswara †	17	7521	24%	3063	185	1272	77	96%	917	184	674	78	3%	87%	90%
Rajasthan	Baran	11	8284	19%	2453	217	1019	90	113%	681	269	417	108	5%	87%	87%
Rajasthan	Barmer	22	14599	11%	2868	132	990	46	57%	1184	135	440	15	1%	85%	86%
Rajasthan	Bharatpur	23	11972	16%	3358	145	1067	46	57%	1396	215	626	81	3%	85%	87%
Rajasthan	Bhilwara	22	18247	19%	5554	250	2032	91	114%	1383	746	1179	302	7%	91%	91%
Rajasthan	Bikaner	21	12068	17%	2945	141	1004	48	60%	732	522	535	193	9%	85%	86%
Rajasthan	Bundi	11	6283	17%	2014	190	744	70	88%	664	151	346	80	5%	86%	88%
Rajasthan	Chittaurgarh	20	8828	22%	3167	159	1390	70	87%	630	376	708	55	2%	84%	88%
Rajasthan	Churu	19	6876	26%	3140	167	1121	60	75%	856	465	606	232	10%	88%	90%
Rajasthan	Dausa	15	8579	17%	2435	167	938	64	81%	691	310	441	114	6%	85%	86%
Rajasthan	Dhaulpur	11	7603	18%	2073	191	780	72	90%	525	218	496	145	10%	86%	87%
Rajasthan	Dungarpur †	12	6036	33%	2752	225	1447	118	148%	607	139	545	49	2%	88%	91%
Rajasthan	Ganganagar	20	9702	18%	3258	165	1219	62	77%	1112	406	459	121	4%	87%	88%
Rajasthan	Hanumangath	17	10956	20%	3144	187	1246	74	93%	649	405	751	155	7%	85%	87%
Rajasthan	Jaipur	58	50076	16%	10960	189	3426	59	74%	3108	1883	2023	661	8%	87%	87%
Rajasthan	Jaisalmer	6	3777	11%	652	116	278	50	62%	178	79	108	12	2%	86%	87%
Rajasthan	Jalore	16	5146	18%	1865	116	577	36	45%	857	46	322	37	3%	85%	87%
Rajasthan	Jhalawar	13	6699	19%	2021	155	768	59	74%	649	133	406	61	4%	86%	88%
Rajasthan	Jhunjhunun	21	9076	18%	2782	132	963	46	57%	770	302	595	112	6%	85%	85%
Rajasthan	Jodhpur	32	17996	17%	4219	132	1565	49	61%	1415	460	693	74	2%	87%	88%
Rajasthan	Karauli	13	8109	21%	2678	201	1023	77	96%	739	226	639	63	3%	85%	87%
Rajasthan	Kota	17	10826	20%	3105	179	1167	67	84%	951	386	498	233	9%	90%	93%
Rajasthan	Nagaur	31	11712	17%	3794	124	1457	48	59%	1324	268	645	104	3%	86%	88%
Rajasthan	Pali	20	9703	19%	3446	171	1201	60	75%	1331	303	571	152	5%	89%	92%
Rajasthan	Rajsamand	11	4510	24%	1735	159	821	75	94%	416	188	300	23	2%	85%	86%
Rajasthan	Sawai Madhopur	12	9321	18%	2393	194	972	79	98%	509	336	534	85	5%	86%	87%

(Contd.)

Annual Performance of Districts (Contd...)

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Rajasthan	Sikar	25	13261	17%	3995	158	1301	51	51%	1266	408	622	158	91%	86%	87%
Rajasthan	Sirohi	9	4988	20%	1598	170	627	67	53%	565	75	285	24	89%	85%	85%
Rajasthan	Tonk	13	9596	24%	3572	267	1508	113	62%	943	279	779	92	91%	85%	88%
Rajasthan	Udaipur	29	22598	31%	6347	218	2770	95	66%	1426	805	1173	209	91%	86%	87%
Sikkim																
Sikkim	East	3	4918	10%	802	306	268	102	64%	152	204	123	88	88%	85%	85%
Sikkim	North *	0.4	321	10%	136	309	26	59	38%	42	38	12	19	83%	94%	94%
Sikkim	South **	1	1315	13%	288	204	112	80	73%	41	77	43	44	91%	89%	89%
Sikkim	West **	1	878	12%	232	176	99	75	72%	38	47	36	32	85%	94%	94%
Tamil Nadu																
Tamil Nadu	Chennai	44	62601	10%	7151	161	2782	63	84%	1484	1792	856	355	91%	88%	88%
Tamil Nadu	Coimbatore	44	29375	9%	4618	104	1962	44	59%	1028	945	568	277	85%	77%	78%
Tamil Nadu	Cuddalore	24	25771	6%	3905	163	1221	51	68%	1303	721	399	454	89%	82%	84%
Tamil Nadu	Dharmapuri	14	20421	6%	2007	149	799	59	79%	463	490	226	161	88%	81%	83%
Tamil Nadu	Dindigul	20	25470	9%	3106	154	1196	59	58%	867	737	261	393	86%	81%	83%
Tamil Nadu	Erode	27	27572	10%	2809	104	1339	50	66%	684	360	357	92	80%	78%	80%
Tamil Nadu	Kancheepuram	30	34186	7%	5014	166	1893	63	60%	1257	984	595	233	92%	84%	86%
Tamil Nadu	Kanniyakumari	18	12954	9%	1791	102	748	43	57%	572	282	155	334	90%	91%	91%
Tamil Nadu	Karur	10	7232	7%	1090	111	459	47	63%	272	185	131	50	84%	72%	77%
Tamil Nadu	Krishnagiri	16	7390	7%	1218	75	451	28	37%	380	221	140	56	86%	78%	79%
Tamil Nadu	Madurai	27	26088	9%	4465	166	1390	52	69%	1181	1063	595	596	85%	83%	84%
Tamil Nadu	Nagapattinam	16	9913	7%	1637	105	653	42	56%	634	168	176	264	90%	86%	87%
Tamil Nadu	Namakkal	16	10827	7%	1821	116	801	51	68%	358	443	204	222	90%	79%	79%
Tamil Nadu	Perambalur	12	9311	8%	1521	123	590	48	63%	481	316	125	212	89%	82%	82%

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Tamil Nadu	Pudukkottai	15	13269	7%	1581	104	635	42	55%	459	295	174	163	12%	88%	81%
Tamil Nadu	Ramanathapuram	12	9303	7%	1526	123	698	56	75%	371	272	166	237	18%	86%	83%
Tamil Nadu	Salem	31	31897	7%	3728	119	1477	47	63%	963	789	458	313	10%	82%	79%
Tamil Nadu	Sivaganga	12	12072	7%	1556	129	538	44	59%	515	242	213	164	13%	86%	84%
Tamil Nadu	Thanjavur	23	34424	6%	3297	142	1162	50	67%	1074	713	287	622	21%	91%	88%
Tamil Nadu	The Nilgiris	8	3314	6%	435	54	133	17	22%	135	126	35	74	19%	82%	80%
Tamil Nadu	Theni	12	13776	7%	2178	189	594	52	69%	1059	269	152	495	26%	84%	80%
Tamil Nadu	Thiruvallur	29	19752	7%	4158	144	1560	54	72%	1043	888	515	148	4%	89%	84%
Tamil Nadu	Thiruvavur	12	9831	8%	1379	113	583	48	63%	376	243	136	17	1%	88%	83%
Tamil Nadu	Tiruchirappalli	25	22535	8%	3083	123	1120	45	59%	929	780	234	177	6%	87%	85%
Tamil Nadu	Tirunelveli	29	22133	9%	4197	143	1449	49	66%	1683	628	362	455	12%	88%	85%
Tamil Nadu	Tiruvanamalai	23	20238	8%	2910	127	1259	55	73%	794	615	222	432	16%	92%	87%
Tamil Nadu	Toothukudi	16	12232	11%	2139	130	977	59	79%	633	310	207	174	9%	89%	85%
Tamil Nadu	Vellore	37	46286	7%	5487	150	2118	58	77%	1710	1068	518	256	5%	92%	87%
Tamil Nadu	Viluppuram	31	23575	10%	4372	141	1732	56	75%	1165	727	515	388	11%	92%	87%
Tamil Nadu	Virudhunagar	18	15801	9%	2886	157	995	54	72%	838	769	247	441	17%	90%	85%
Tripura																
Tripura	Dhalai *	3	1414	16%	303	92	173	52	70%	76	6	45	2	1%	87%	80%
Tripura	North Tripura	6	1887	13%	474	75	209	33	44%	162	36	47	2	0%	78%	74%
Tripura	South Tripura	8	3045	8%	374	46	195	24	32%	73	35	54	1	0%	87%	82%
Tripura	West Tripura	16	6055	15%	1163	71	678	41	55%	167	155	143	16	2%	86%	88%
Uttar Pradesh																
Uttar Pradesh	Agra	40	22070	17%	5636	141	1659	41	44%	1383	621	1567	356	10%	87%	88%
Uttar Pradesh	Aligarh	33	22470	14%	4989	151	2221	67	71%	1589	561	573	300	7%	92%	88%
Uttar Pradesh	Allahabad	55	35455	13%	7539	138	2895	53	56%	2623	527	1136	445	7%	87%	90%
Uttar Pradesh	Ambedkar Nagar	22	6824	12%	1496	67	639	28	30%	566	139	83	16	1%	89%	88%
Uttar Pradesh	Auraiya	13	8526	15%	2063	158	1000	77	81%	633	83	302	35	2%	91%	83%
Uttar Pradesh	Azamgarh	44	13122	18%	3548	81	1666	38	40%	973	268	544	74	3%	91%	81%
Uttar Pradesh	Baghpat	13	6235	18%	1733	134	851	66	69%	344	222	308	68	5%	92%	90%
Uttar Pradesh	Bahraich **	30	20578	14%	4583	154	1952	66	69%	1513	540	575	193	5%	91%	90%
Uttar Pradesh	Ballia	30	6815	13%	2100	69	630	21	22%	1176	115	142	74	4%	92%	78%
Uttar Pradesh	Balrampur	19	5904	14%	1387	74	642	34	36%	509	72	127	51	4%	89%	83%

(Contd.)

Annual Performance of Districts (Contd...)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
State	District	Population (in lakh) covered by RNTCP ¹	No. of TB suspects examined	% of smear positive TB cases ² among suspects	Total patients registered for treatment ³	Annualized total case detection rate	New smear positive patients registered for treatment	Annualized new smear positive case detection rate (%)	% 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	No of smear positive re-treatment cases registered for treatment	No (%) of pediatric cases out of all New cases	3 month conversion rate of new smear positive patients ⁴	Cure rate of new smear positive patients ⁵	Treatment success rate of new smear positive patients ⁵
Uttar Pradesh	Banda **	17	6465	17%	1797	108	560	34	45%	690	137	406	100	7%	60%	76%
Uttar Pradesh	Barabanki **	34	16674	17%	4439	131	2148	63	63%	1243	422	618	205	5%	84%	87%
Uttar Pradesh	Bareilly	40	31002	15%	7870	198	2951	74	56%	2293	662	1315	292	5%	82%	85%
Uttar Pradesh	Basti **	23	9115	18%	3150	138	1100	48	47%	1258	482	289	208	7%	84%	86%
Uttar Pradesh	Bijnor **	35	18719	13%	3185	92	1638	47	73%	605	380	536	213	8%	84%	86%
Uttar Pradesh	Budaun **	34	21668	13%	4592	135	2254	66	59%	1571	131	505	211	5%	83%	91%
Uttar Pradesh	Bulandshahar	32	18560	14%	5339	165	2010	62	47%	2287	446	496	279	6%	91%	92%
Uttar Pradesh	Chandauli	18	6524	14%	1237	68	524	29	68%	252	85	341	25	3%	67%	67%
Uttar Pradesh	Chitrakoot	9	4128	20%	1350	152	563	64	55%	461	58	186	50	5%	33%	33%
Uttar Pradesh	Deoria	30	6222	14%	1704	56	570	19	43%	752	152	196	66	4%	78%	81%
Uttar Pradesh	Etah	31	17369	16%	3824	124	1808	59	66%	944	347	620	257	8%	86%	90%
Uttar Pradesh	Etawah	15	9220	14%	1751	118	710	48	62%	435	148	380	57	4%	86%	88%
Uttar Pradesh	Faizabad	19	7992	13%	1653	88	743	39	61%	467	206	223	92	6%	85%	88%
Uttar Pradesh	Farrukhabad	17	9396	17%	2195	126	1042	60	65%	556	232	354	116	6%	84%	84%
Uttar Pradesh	Fatehpur **	26	10240	14%	2491	98	951	37	52%	893	234	357	82	4%	82%	92%
Uttar Pradesh	Firozabad	23	9483	24%	3169	140	1063	47	71%	427	370	1034	246	13%	56%	56%
Uttar Pradesh	Gautam Budh Nagar	13	8597	16%	3065	232	1003	76	52%	916	697	346	220	8%	89%	90%
Uttar Pradesh	Ghaziabad	36	28343	15%	8715	239	3424	94	58%	2476	1482	1084	664	9%	90%	90%
Uttar Pradesh	Ghazipur	34	7808	13%	1882	56	713	21	50%	712	104	250	52	3%	78%	82%
Uttar Pradesh	Gonda	31	8201	19%	3363	110	1091	36	38%	1767	54	434	126	4%	83%	85%
Uttar Pradesh	Gorakhpur	42	8409	13%	1956	47	698	17	48%	753	153	291	76	5%	72%	72%
Uttar Pradesh	Hamirpur-UP **	12	6483	12%	1696	147	452	39	34%	871	143	147	112	8%	85%	88%
Uttar Pradesh	Hardoi **	38	21050	14%	5095	135	2072	55	53%	1859	291	781	183	4%	86%	87%
Uttar Pradesh	Hathras	15	8434	14%	1537	104	701	47	71%	288	73	387	70	7%	77%	79%

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Uttar Pradesh	Jalaun **	16	9459	16%	2380	148	947	59	62%	687	135	490	85	89%	84%	86%
Uttar Pradesh	Jaunpur	43	17748	15%	5778	133	2069	48	50%	2593	529	469	198	91%	84%	86%
Uttar Pradesh	Jhansi **	19	9914	15%	2168	112	944	49	51%	581	200	322	92	84%	81%	82%
Uttar Pradesh	Jyotiba Phule Nagar**	17	10980	11%	1904	115	938	57	59%	557	53	272	51	85%	72%	74%
Uttar Pradesh	Kannauj	15	5327	16%	1136	74	510	33	35%	251	79	273	46	87%	80%	80%
Uttar Pradesh	Kanpur Dehat **	18	4994	19%	1590	91	740	42	44%	468	97	252	46	82%	67%	76%
Uttar Pradesh	Kanpur Nagar	46	18345	22%	5337	117	2118	46	49%	1328	680	995	296	87%	77%	85%
Uttar Pradesh	Kaushambi	14	2982	13%	966	67	356	25	26%	454	44	96	19	56%	NE	NE
Uttar Pradesh	Kheri	35	17309	18%	4825	136	2171	61	64%	1603	288	747	192	87%	84%	87%
Uttar Pradesh	Kushinagar	32	10223	10%	1834	57	751	23	25%	731	134	174	66	91%	83%	85%
Uttar Pradesh	Lalitpur **	11	6739	15%	1522	141	728	67	71%	430	49	217	76	86%	82%	82%
Uttar Pradesh	Lucknow	41	37523	13%	6903	169	2742	67	71%	1828	995	1079	364	89%	87%	87%
Uttar Pradesh	Maharajganj **	24	6414	11%	1432	60	543	23	24%	660	85	142	41	91%	83%	83%
Uttar Pradesh	Mahoba **	8	3316	24%	807	103	417	53	56%	53	53	280	22	90%	82%	82%
Uttar Pradesh	Mainpuri	18	8357	14%	1831	104	933	53	56%	622	65	203	57	88%	86%	91%
Uttar Pradesh	Mathura	23	10691	15%	3012	131	1356	59	62%	1036	323	270	118	93%	92%	94%
Uttar Pradesh	Mau **	20	6737	9%	2069	101	439	21	23%	1368	94	102	73	88%	80%	85%
Uttar Pradesh	Meerut	33	23913	14%	6241	188	2739	82	87%	1853	835	619	223	92%	90%	91%
Uttar Pradesh	Mirzapur	23	15058	12%	2798	119	1452	62	65%	936	124	285	86	93%	89%	90%
Uttar Pradesh	Moradabad **	42	26160	12%	5987	144	2465	59	62%	2520	407	548	250	81%	71%	76%
Uttar Pradesh	Muzaffarnagar	39	21845	15%	4551	116	2181	56	59%	1070	488	745	146	87%	82%	86%
Uttar Pradesh	Pilibhit **	18	16534	11%	2488	137	932	51	54%	647	141	616	104	89%	79%	80%
Uttar Pradesh	Pratapgarh **	30	9262	13%	2277	75	859	28	30%	994	166	250	78	88%	73%	82%
Uttar Pradesh	Rae Bareilj **	32	12775	20%	4559	143	2007	63	66%	1928	231	379	146	84%	73%	84%
Uttar Pradesh	Rampur	21	20135	11%	3833	180	1543	72	76%	1135	343	776	149	88%	85%	85%
Uttar Pradesh	Saharanpur	32	24117	15%	5540	176	2129	68	71%	1088	861	1196	363	90%	87%	89%
Uttar Pradesh	Sant Kabir Nagar **	16	4714	11%	927	59	398	25	27%	366	72	73	20	82%	33%	33%
Uttar Pradesh	Sant Ravidas Nagar	15	9349	12%	2493	167	843	56	59%	1155	131	252	135	96%	87%	92%
Uttar Pradesh	Shahjahanpur	28	12499	15%	2824	100	1302	46	49%	895	227	343	98	87%	80%	83%
Uttar Pradesh	Shravasti **	10	2620	16%	713	73	327	34	35%	219	51	101	9	85%	100%	100%
Uttar Pradesh	Siddharthnagar **	23	7920	11%	1482	66	617	27	29%	584	77	192	42	90%	86%	88%
Uttar Pradesh	Sitapur **	40	27144	13%	6244	156	2593	65	68%	2306	314	781	196	89%	86%	89%
Uttar Pradesh	Sonbhadra	16	4463	14%	844	52	468	29	30%	211	51	106	19	93%	89%	89%
Uttar Pradesh	Sultanpur	35	12739	11%	2387	68	1124	32	33%	888	178	187	88	84%	84%	90%

(Contd.)

Annual Performance of Districts (Contd...)

State	District	Population (in lakh) covered by RNTCP ¹	No. of TB suspects examined	% of smear positive TB cases ² among suspects	Total patients registered for treatment ³	Annualized total case detection rate	New smear positive patients registered for treatment	Annualized new smear positive case detection rate (%)	% 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	No of smear positive retreatment cases registered for treatment	No (%) of pediatric cases out of all New cases	3 month conversion rate of new smear positive patients ⁴	Cure rate of smear positive patients ⁵	Treatment success rate of new smear positive patients ⁵
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Uttar Pradesh	Unnao **	30	14154	15%	5209	174	1726	58	39%	2655	316	504	181	4%	88%	88%
Uttar Pradesh	Varanasi	35	22279	14%	5445	156	2259	65	54%	1934	637	516	329	7%	86%	88%
Uttarakhand																
Uttarakhand	Almora	7	4154	10%	628	92	246	36	65%	130	124	120	22	4%	93%	93%
Uttarakhand	Bageshwar	3	1213	11%	235	87	93	34	62%	58	33	51	10	5%	85%	86%
Uttarakhand	Chamoli	4	2476	15%	601	150	222	55	58%	159	63	128	19	4%	87%	88%
Uttarakhand	Champawat	2	1885	7%	221	91	93	38	40%	80	11	35	6	3%	93%	95%
Uttarakhand	Dehradun	14	10490	12%	2467	177	719	52	44%	913	450	308	240	12%	89%	89%
Uttarakhand	Garhwal	8	4668	10%	840	111	321	42	50%	324	84	95	12	2%	82%	83%
Uttarakhand	Hardwar	16	8173	14%	1439	92	602	38	40%	326	93	351	33	3%	83%	83%
Uttarakhand	Nainital	8	7516	15%	1221	147	470	57	60%	228	216	281	56	6%	81%	82%
Uttarakhand	Pithoragarh	5	2593	16%	532	106	249	50	67%	123	53	107	8	2%	86%	93%
Uttarakhand	Rudrapur	2	1425	13%	314	127	133	54	61%	84	34	56	14	6%	87%	87%
Uttarakhand	Tehri Garhwal	7	3367	12%	829	126	264	40	42%	262	104	149	41	7%	92%	92%
Uttarakhand	Udhamsingh Nagar	13	9527	13%	1857	138	686	51	53%	613	128	345	39	3%	86%	86%
Uttarakhand	Uttarkashi	3	2264	12%	469	147	181	57	61%	116	72	86	23	6%	87%	89%
West Bengal																
West Bengal	Bankura	34	24865	12%	4152	122	2239	66	71%	894	525	363	81	2%	88%	89%
West Bengal	Bardhaman	74	46338	12%	9920	134	4061	55	55%	3356	747	902	551	7%	84%	86%
West Bengal	Birbhum	32	21885	14%	4214	131	2281	71	69%	1034	262	433	75	2%	86%	87%
West Bengal	Dakshin Dinajpur	16	12257	13%	2360	147	1271	79	73%	470	274	234	76	4%	88%	88%
West Bengal	Darjiling **	17	13946	14%	3539	206	1121	65	87%	784	849	492	268	10%	79%	82%
West Bengal	Haora	46	32188	11%	6527	143	2368	52	59%	1642	1076	826	521	10%	83%	84%
West Bengal	Hugli	54	31745	11%	6629	123	2740	51	60%	1803	903	664	193	4%	88%	89%

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	
West Bengal	Jalpaiguri **	36	26043	15%	6128	168	3018	83	111%	76%	932	1045	840	416	8%	87%	87%
West Bengal	Koch Bihar **	27	18715	10%	3044	115	1435	54	72%	67%	722	480	247	73	3%	86%	87%
West Bengal	Kolkata	49	36776	14%	7077	144	2899	59	79%	74%	993	1637	1141	519	9%	84%	83%
West Bengal	Maldah **	35	24696	14%	5494	156	2696	77	102%	65%	1474	470	571	315	7%	88%	83%
West Bengal	Medinipur East	47	27070	12%	3881	82	2541	54	72%	85%	436	365	369	125	4%	89%	85%
West Bengal	Medinipur West	56	29904	14%	6819	122	3023	54	72%	62%	1837	748	601	158	3%	90%	87%
West Bengal	Murshidabad	63	43233	11%	7434	119	3663	58	78%	68%	1706	1025	754	326	5%	91%	89%
West Bengal	Nadia	49	40640	8%	6137	125	2662	54	72%	59%	1835	663	534	192	4%	90%	89%
West Bengal	North 24 Parganas	95	52436	12%	10907	114	5213	55	73%	75%	1756	1780	1258	490	6%	90%	89%
West Bengal	Puruliya	27	18247	12%	4215	155	1766	65	87%	55%	1463	266	356	114	3%	91%	89%
West Bengal	South 24 Parganas	74	41569	11%	7751	105	4066	55	73%	73%	1499	1002	746	301	5%	92%	89%
West Bengal	Uttar Dinajpur	26	17455	10%	3091	118	1372	53	70%	63%	809	418	290	116	4%	89%	87%
Grand total		11142	6224636	13%	1397498	125	553660	50	66%	58%	400496	183180	190964	64697	6%	89%	86%
Summary of performance of Tribal Districts		503	267675	15%	70924	141	29899	59	79%	59%	21009	7941	8244	2748	5%	88%	81%
Summary of performance of Poor and Backward Districts		2522	1028022	14%	262138	103	105108	41	55%	53%	92138	21113	31932	9635	4%	87%	85%

* Tribal Districts (more than 50% tribal population) ** Poor/Backward Districts † Tribal & Poor/Backward Districts

NR indicate states have not reported till 25th February 2007; Values for blank areas are not expected as these districts/reporting units have been newly created or have stopped reporting in 2006 as they have merged with other reporting units

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, Puducherry, Tamil Nadu) is 75 and West Zone (Chhattisgarh, Dadra & Nagar Haveli, Daman & Diu, Goa, Gujarat, Madhya Pradesh, Maharashtra, Rajasthan) is 80; Orissa is 85

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

² Smear positive patients diagnosed include new smear positive cases and smear positive retreatment cases

³ 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'

⁴ Smear conversion rate not expected for states that began implementing RNTCP during 4th quarter 2006

⁵ Cure rate and success rate are not expected for states that began implementing RNTCP after 4th quarter 2005

**Referral of TB Suspects from VCTC to RNTCP diagnostic units, during 2006
(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)		804	561	1041	26	21	653					3106		
Total No. of districts		24	28	48	9	8	30					147		
1. Number of TB suspects referred from VCTCs to RNTCP facilities*	7662	9664	2175	2842	177	101	60	71	7338	9081	20263	24561		
2. Out of the above persons, number diagnosed as having TB:														
a) Sputum Positive TB	942	1912	320	499	13	6	19	9	719	1185	2315	4118		
b) Sputum Negative TB	513	703	181	186	25	3	6	42	639	310	1491	1382		
c) Extra-Pulmonary TB	70	62	82	69	6	1	4	2	326	96	546	263		
d) Total diagnosed TB patients	1525	2677	583	754	44	10	29	53	1684	1591	4352	5763		
3. Out of above total diagnosed TB patients (d), number receiving DOTS	1150	2281	459	600	30	8	23	22	862	1219	2948	4716		

* Includes TB suspects referred during 4th quarter 2005 and 3rd quarter 2006

Towards Freedom from TB...



Sputum microscopic examination



Bringing back smiles with DOTS



Patient-wise boxes of drugs



A DOT provider

