

TB India 2001



RNTCP
Status
Report



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<http://www.tbcindia.org>

TB is curable and the TB epidemic is a winnable battle

- Treatment for 6 months with safe medicines can cure virtually all TB patients
- Treatment can be given on 3 days per week
- Neither hospitalization nor special nutrition are required
- World Bank has identified TB control as one of the most cost effective of all health interventions
- Countries implementing effective TB control have cut TB deaths by 80% in 3 years and cases by 50% in 8 years

Cover: Tuberculosis patient speaking with treatment observer, and patient-provider interaction meeting, Orissa

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Foreword

India has long been at the forefront of the global battle against tuberculosis. Pioneering studies at the Tuberculosis Research Centre, Chennai and the National Tuberculosis Institute, Bangalore established principles of tuberculosis control which are followed even to this day the world over. These principles include the effectiveness of ambulatory treatment of tuberculosis, the effectiveness of intermittent treatment regimens, the necessity of direct observation of treatment by a trained individual who is not a family member, the usefulness and practicability of AFB microscopy as a diagnostic tool among patients reporting to health facilities, and the crushing burden of tuberculosis on our society.



Despite this illustrious past, it is sad to note that fifteen years ago, the Director General of the World Health Organization commented that, "the whole world benefits from the fruits of Indian tuberculosis research . . . the whole world, except India."

I am very happy to report that this statement is no longer correct. While the world continues to benefit from the fruits of Indian tuberculosis research, more than five lakh of our countrymen have also benefited in just the past few years. It therefore gives me great pleasure to bring out this status report on the Revised National Tuberculosis Control Programme (RNTCP). The RNTCP although pilot tested in 1993 began large-scale expansion in late 1998. By early 2001, more than one third of the country is covered by the RNTCP, making it the second largest such programme in the world. Each month, there are nearly one crore patient visits to health facilities covered by the RNTCP.

Each and every day, more than 10,000 sputum examinations for tuberculosis are done in RNTCP areas and more than 1,000 patients are started on treatment. Nearly two crore directly observed doses of anti-tuberculosis treatment have been given. Even more important than these large numbers is the quality of diagnosis, treatment and monitoring. Treatment success rates remain high, with more than eight out of ten patients being cured. The monitoring and evaluation system is extremely powerful, allowing a rapid assessment of progress and problems so that corrective actions can be taken.

I am now confident that India will be able to successfully tackle the problem of tuberculosis. Private doctors, medical college professors, as well as those of us in the government, must continue to keep the patient's needs paramount on our minds. I ask all doctors to ensure the following:

- *Every patient with cough for three weeks or more should have three sputum examinations done in a competent laboratory. Sputum microscopy must be the primary tool for diagnosis of pulmonary tuberculosis, and it should be borne in mind that beginning anti-tuberculosis treatment for a patient with pulmonary tuberculosis without first obtaining three sputum smears borders on malpractice.*
- *The only way to ensure that every patient who starts treatment has the best possible chance of completing the full course is through direct observation of treatment, whereby a trained individual who is not a family member facilitates and watches the patient swallowing medicine. It goes without saying that only scientifically proven regimens, such as those used in the RNTCP, should be utilized.*
- *Every doctor in the clinic or in the hospital who begins even a single patient on treatment for tuberculosis must ensure that there is systematic recording and monitoring of the progress and outcome of all patients. This is useful for individual and professional growth, and because of concern for welfare not only of the individual patient, but also the welfare of the community as a whole. Programmes which do not cure a high proportion of patients actually do more harm than good by promoting the development and spread of drug resistant strains of tuberculosis.*

With these few words I congratulate all those associated with the RNTCP on the excellent success of their efforts. I urge all health workers and all those who care about the control of tuberculosis to re-dedicate themselves with renewed vigour and sincerity to the service of tuberculosis patients. Working together, we can, at long last, control the "Captain of Death". Tools for the accurate diagnosis and reliable cure of tuberculosis patients, and therefore for the control of tuberculosis in our country, are with us. The challenge for all of us is to apply those tools rapidly, scientifically and wisely.



Padamashree Dr CP Thakur
Union Minister for Health and Family Welfare

TB: Magnitude of the Problem

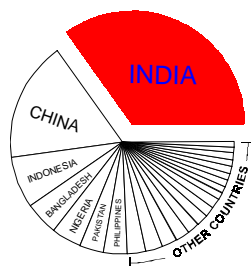


TB patient, Orissa

Every day,
more than 20 000 people become infected with TB, more than 5 000 develop TB and more than 1 000 die because of TB.

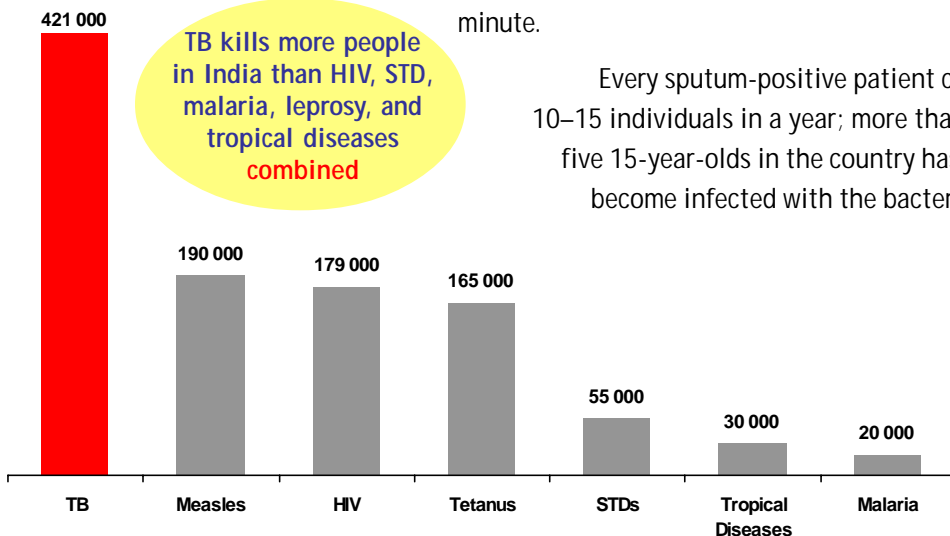
Every year,
20 lakh people develop TB in India, and nearly 500 000—1 000 every day, 1 every minute—die from it.

India accounts for nearly one third of the global burden of tuberculosis, and the disease is one of India's most important public health problems.



India accounts for nearly **one third** of the global TB burden

Every day in India more than 20 000 people become infected with the tubercle bacillus, more than 5 000 develop the disease, and more than 1 000 die from TB. In India, tuberculosis kills 14 times more people than all tropical diseases combined, 21 times more than malaria, and 400 times more than leprosy. Every year, another 20 lakh people develop tuberculosis in India, nearly one million of them highly infectious sputum-positive cases — two such cases developing every minute.

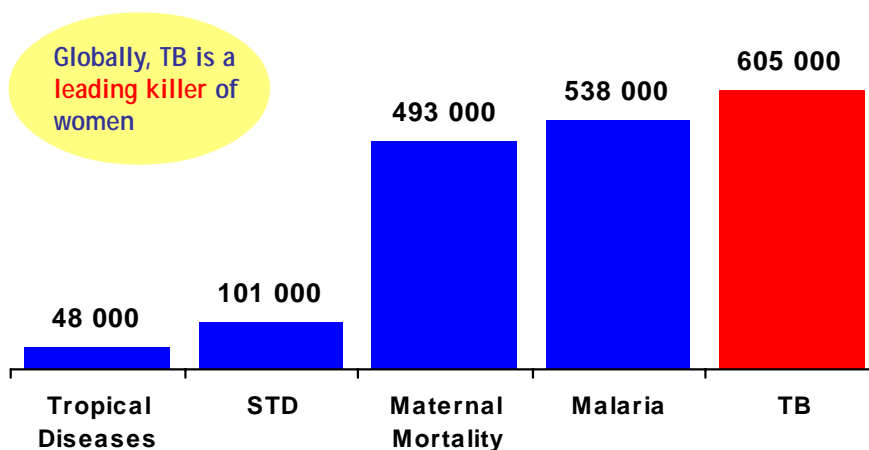


TB kills more people in India than HIV, STD, malaria, leprosy, and tropical diseases combined

Every sputum-positive patient can infect 10–15 individuals in a year; more than one in five 15-year-olds in the country has already become infected with the bacteria.

*Every year,
300 000 children are
forced to leave school
because their parents
have tuberculosis,
and
100 000 women lose
their status as
mothers and wives
because of the social
stigma.*

Tuberculosis is a major barrier to social and economic development. The direct and indirect costs of tuberculosis to the country amount to Rs 12 000 crore (US \$3 billion) per year. Every year, more than 17 crore work days are lost to the national economy on account of tuberculosis, at a cost of Rs 700 crore (US \$200 million). Every year, 300 000 children are forced to leave school because their parents have tuberculosis, and 100 000 women lose their status as mothers and wives because of the social stigma of tuberculosis. Tuberculosis kills more women than all causes of maternal mortality combined.



Unless urgent action is taken, more than 40 lakh people in India will die of tuberculosis in the next decade

HIV and multidrug resistant TB threaten to make this situation even worse. Unless urgent action is taken, more than 40 lakh people in India will die of tuberculosis in the next decade. There is no time for complacency. Each life saved represents a child, mother or father who will go on to lead a longer, productive, TB-free, life.



Binocular microscopes and patient-wise boxes being demonstrated at Patna Health Mela



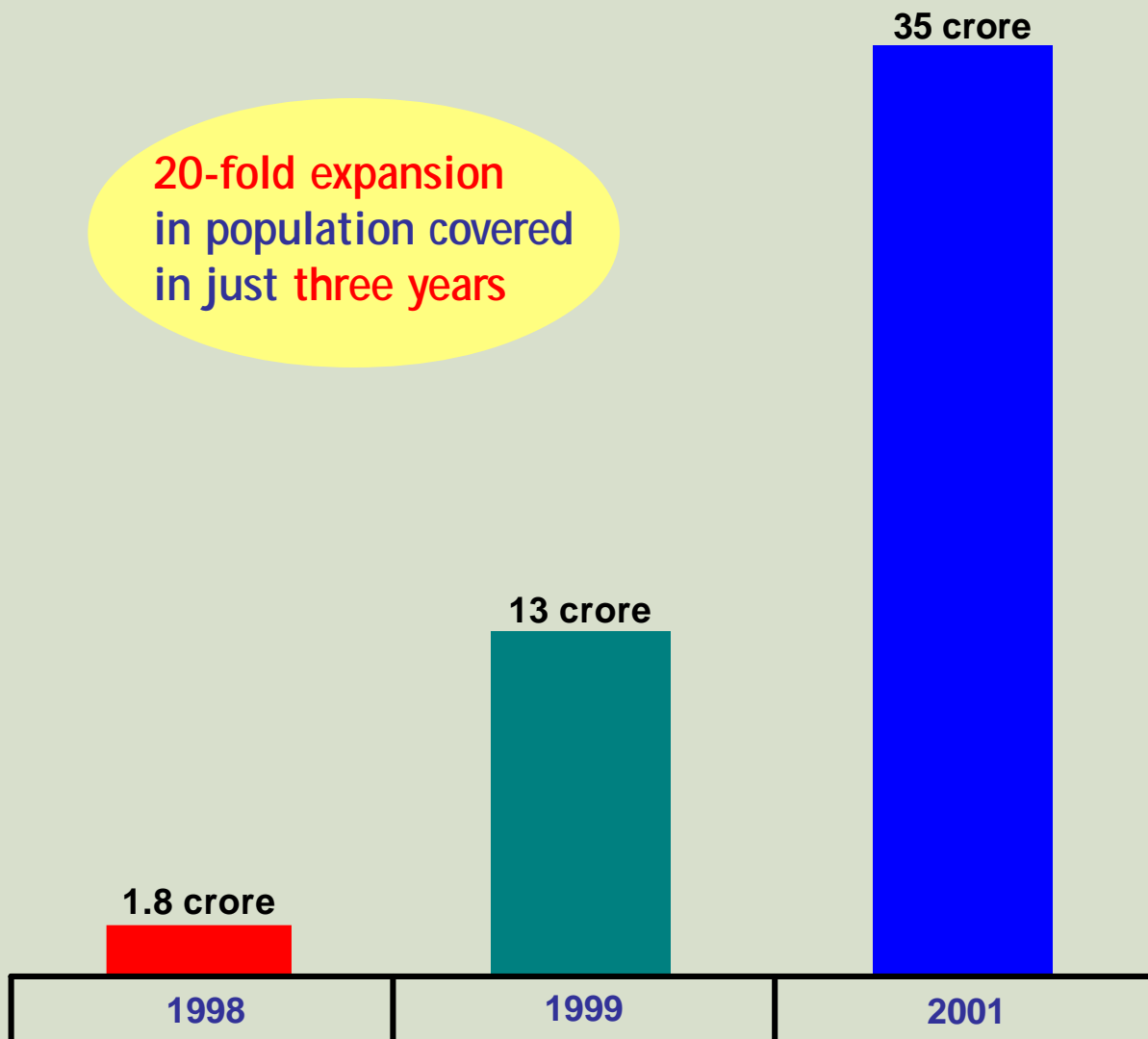
TB stall at Patna Health Mela winning First Prize



Model in front of TB stall at Lucknow Health Mela; India shoulders one third of the global burden of TB — the RNTCP is lifting this burden

RNTCP Expansion

20-fold expansion
in population covered
in just three years









**1.5 lakh health workers
trained**
**1 400 supervisors
appointed**
**75 lakh microscopic
examinations**
**1.5 crore directly
observed doses**

The Revised National Tuberculosis Control Programme (RNTCP) is succeeding and expanding rapidly. Begun on a pilot basis in 1993, large-scale expansion began in 1998. By mid-1999, the RNTCP became the second largest DOTS programme in the world. By early 2001, more than one third of the country has access to the programme.

Progress of this massive scope has required the systematic training of more than 1.5 lakh health workers, the deployment of more than 1 400 supervisors in districts throughout the country, the performance of more than 75 lakh microscopic examinations, and the administration of nearly two crore directly observed doses of anti-tuberculosis treatment. As a result of this hard work, more than five lakh patients have been placed on treatment under the programme, and more than 80 000 lives have been saved.

RNTCP Implementation—Timeline

-  **1992:** National programme review of tuberculosis concluded that efforts to control the disease had not made any significant impact
-  **1993:** Revised National Tuberculosis Control Programme was begun, applying the principles of DOTS — which were largely discovered in India
-  **1997:** Government of India obtained a “soft” loan from the World Bank for US \$142 million to implement the RNTCP in at least one third of the country and to prepare the rest of the country for implementation of RNTCP at a later date; RNTCP in Orissa is supported by the Danish Government and RNTCP in Andhra Pradesh is supported by the British Government
-  **1999:** RNTCP expands 7-fold to become the second largest such programme in the world
-  **2001:** One third of the country covered, more than 5 lakh patients treated
-  **2002:** Plan to cover half the country

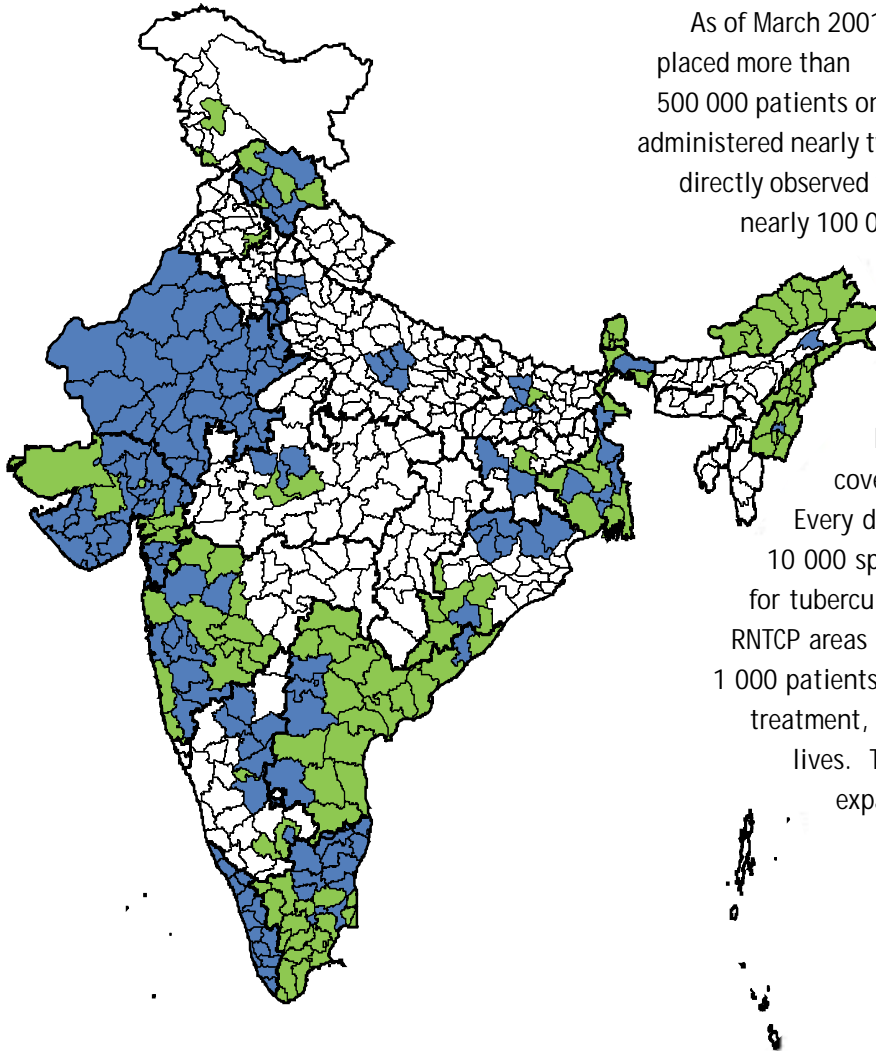
The RNTCP has expanded rapidly in the past year. From a population coverage of 1.8 crore — less than 2% of the country — in 1998, by early 2001, the programme is covering more than one third of the country. This represents one of the fastest expansions of this strategy anywhere in the world. Expansion has not been easy. For this to occur:

- Nearly 200 tuberculosis control societies have been formed in states and districts.
- Funds have been released from the Central government directly to the societies.
- Detailed planning for implementation has occurred at the state and district levels.
- Civil works have been done to ensure safe storage of drugs and to improve laboratories where microscopy is done.
- More than 1 400 supervisors have been deputed or hired on contract to ensure the quality of diagnosis and treatment.
- More than 1.5 lakh health workers have been trained using high-quality modular training materials, including more than 10 000 doctors and more than 3 000 laboratory technicians.

From 1.8 crore population in 1998, the RNTCP has expanded to reach 35 crore population in March 2001

Appraisal teams from the central government, state governments, and national institutions have visited each and every district prior to service delivery to ensure that high standards are maintained.

Districts implementing  and preparing for  RNTCP implementation



As of March 2001, the RNTCP had placed more than 500 000 patients on DOTS, administered nearly two crore doses of directly observed treatment and saved nearly 100 000 lives.

Each month, there are nearly one crore patient visits to health facilities covered by the RNTCP. Every day, more than 10 000 sputum examinations for tuberculosis are done in RNTCP areas and more than 1 000 patients are started on treatment, saving nearly 200 lives. The plan is to expand the RNTCP to cover half of the country by 2002.

Joint review of the tuberculosis control programme

To assess the performance of the RNTCP, a joint review of the tuberculosis control programme was undertaken in February 2000 by a team of 25 international and national experts. The team visited more than 100 health facilities, interviewed more than 1 000 patients and health workers, and verified the records of more than 10 000 patients. The review found that the RNTCP is succeeding and has already saved more than Rs 1 300 crore (US\$ 300 million) in economic costs.

Monitoring and evaluation

Although diagnostic and treatment policies of the RNTCP are technically very sound, perhaps the greater strength of the RNTCP lies in its system of reporting. Each quarter, every area implementing the programme reviews each and every patient and reports on their diagnosis, progress and outcome. Each and every of the more than five lakh TB patients treated in the programme is recorded in a TB Register, and all essential details of their treatment are available. This information is reported quarterly to the district, state and central levels. The quality of reporting has been exemplary, with virtually all districts reporting on time. These reports present an accurate picture of actual programme performance — both good and bad. This allows prompt recognition of good performance and prompt corrective action where required.

Status and prospects

Conservative estimates are that nationwide effective DOTS implementation by 2005 would result in cumulative savings of more than Rs 108 000 crore (US\$ 27 billion) through the year 2020. For an investment of Rs 200 crore (US\$ 50 million) per year, the yield would be more than Rs 10 000 crore (US\$ 2.5 billion) per year. Full coverage would transfer Rs 700 crore (US\$ 160 million) every year to patients in medical expenses averted.

By early 2001, every day 1 000 patients were being placed on treatment in the RNTCP, representing 200 lives saved and 2 000 tuberculosis infections prevented. More than 500 000 patients had been put on treatment by March 2001, saving nearly 100 000 lives and preventing more than 1 000 000 TB infections. The challenge in the years ahead is to maintain the pace and quality of the programme while achieving national coverage so that tuberculosis is no longer a significant public health problem in India.



Dr SP Agarwal, Director General of Health Services, giving address during launch of Revised National Tuberculosis Programme in India



Orientation classes on RNTCP to textile workers, Kannur, Kerala

Diagnosing Patients

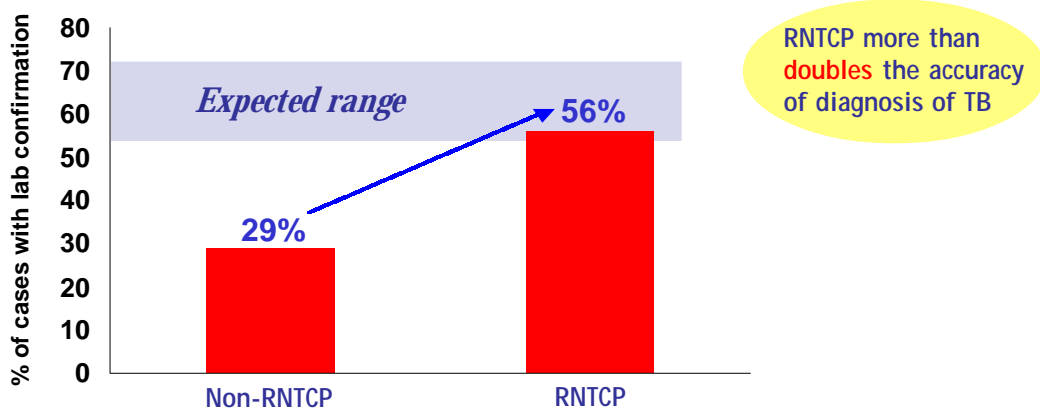


Case detection by microscopic examination of sputum

In the RNTCP, the quality of diagnosis has been significantly improved, bringing it at par with international standards. This has been accomplished by improving both the infrastructure and the training for diagnosis of tuberculosis. Binocular microscopes have been provided to microscopy laboratories throughout the country. Civil works have been done to ensure that laboratories are well equipped and structured for efficient operations. A three-tiered system of quality control has been implemented so that each and every positive test is cross-checked and a significant sample of the negative tests is also cross-checked. This quality control network extends right from national-level institutions — the National Tuberculosis Institute, Bangalore and the Tuberculosis Research Centre, Chennai — to state governments, district tuberculosis centres, and laboratory technicians working on the front lines of the battle against tuberculosis.

All patients with cough of 3 weeks or more should have 3 sputum samples examined for TB

In addition, a large number of doctors throughout the country have been trained in improved, scientific procedures to evaluate and treat all patients suspected of tuberculosis. The diagnostic algorithm ensures that patients who are treated for TB actually have the disease. In the previous programme, and, all too often, in the private sector, patients who do not have tuberculosis are unnecessarily treated for the disease on the basis of X-ray alone. While X-ray is an important complementary tool for the diagnosis of tuberculosis, sputum microscopy is the most reliable, specific and objective method available.

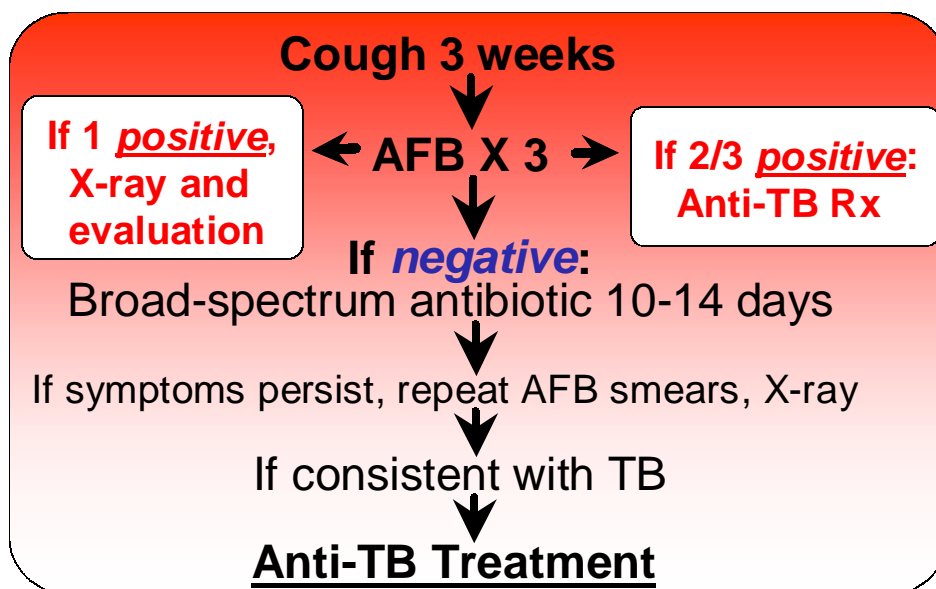


Not only is the quality of diagnosis good, but even the quantum of diagnostic activities is impressive. Each month, there are nearly one crore patient visits to health facilities covered by the RNTCP and every day more than 10 000 sputum examinations for tuberculosis are done in RNTCP areas. Every quarter, more than one lakh of sputum tests are cross-checked by specially trained supervisors.

Each month nearly one crore patient visits to health facilities; every day, more than 10 000 sputum slides are examined; every quarter, more than one lakh sputum tests are cross-checked

As a result of all of these efforts, the quality of diagnosis in the RNTCP is excellent. In contrast with the earlier programme, where only one out of four patients had their diagnosis confirmed in the laboratory, more than half of patients have laboratory confirmed tuberculosis, as is expected in a well-performing programme.

Diagnostic algorithm





Dr CP Thakur, Union Health Minister, giving last dose of medicine to cure a TB patient at Lucknow



DOTS worker with TB patient, Orissa

Curing Patients



Rally on World TB Day 2000 at Jaipur, Rajasthan

But diagnosing patients is only the first step. Tuberculosis treatment takes at least six months, and patients feel better within the first few weeks or months of treatment with powerful anti-tuberculosis drugs. For treatment to succeed — and for tuberculosis to be controlled — it is essential that treatment be standardized, effective, and that patients are directly observed to take treatment. Availability of drugs have been decentralized ensuring that the patient is the VIP of the programme and taking of drugs should not require any change in the patient's daily schedule.

The RNTCP ensures standard state-of-the-art treatment to patients with all types of tuberculosis. In the RNTCP, depending on their condition, patients receive any one of three categories of treatment.

Doctors decide on which category treatment to use based on a standard algorithm which includes application of clinical judgment.

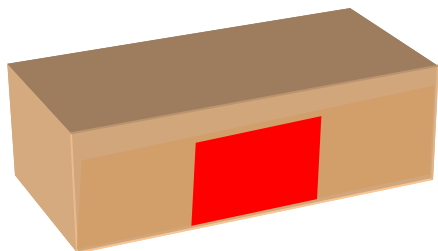
For each category of treatment, a standardized regimen is used. Follow-up sputum tests are taken to monitor the patient's progress and outcome.

In the RNTCP, every patient receives drugs in a patient-wise box.

The patient-wise box ensures that no patient can begin treatment unless the full course of medicines is available.

Most importantly, every dose of treatment in the first, intensive phase of treatment is given under direct observation, and at least the first dose of the three

Patients are the **VIP** of the programme, and the health system, rather than the patient, is responsible for ensuring cure



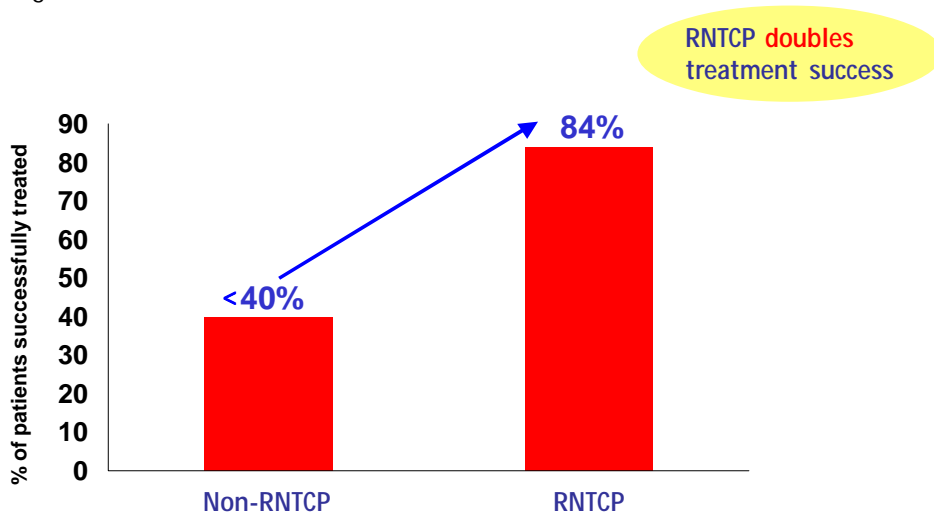
Patient-wise box

doses per week in the continuation phase is also given under direct observation. Direct observation of treatment is a service to patients and communities. It ensures that patients take medicines as prescribed in the right dosages, at the right intervals, and for the complete duration. Direct observation offers a platform for building a human bond between the health provider and the patient. This not only helps in winning the confidence of patients but also helps in promptly addressing any problem developing with the patient. In the DOTS strategy, of which the RNTCP is an adaptation, patients are the VIP of the programme, and the health system, rather than patient, is responsible for ensuring cure.

Virtually anyone — other than a family member — can be a treatment observer as long as they are trained and accountable to the health system and acceptable and accessible to the patient. The ideal of the programme is that no patient should have to pay for transport or treatment, miss work, or suffer stigma to participate in a DOTS programme.

Direct observation of treatment succeeds by building a human bond between the patient and a health care worker

As a result of these policies, the RNTCP reliably cures patients. More than eight out of ten patients are cured in the programme as compared to less than four out of 10 in the earlier programme.



Directly Observed Treatment, Short-course (DOTS)

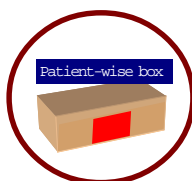
Directly Observed Treatment, Short-course (DOTS) is a five-point strategy including the components of political and administrative commitment, diagnosis primarily through microscopy, uninterrupted supply of good quality drugs, direct observation of treatment, and monitoring and supervision to track diagnosis, progress and outcome.

DOTS — The five-point strategy



Case detection primarily by microscopic examination of sputum of patients presenting to health facilities

Adequate drug supply



Short-course chemotherapy given under direct observation

Systematic monitoring and accountability for every patient diagnosed.



Political will



Rally of cured TB patients in Howrah, Calcutta, World TB Day 2000



Examples of Treatment Observer

- Village Sarpanch
- Malaria Link Workers
- Headmistress of school
- Tea shop owner
- Landlord
- Cured patient
- Family member of health worker
- Wife of District Tuberculosis Officer
- Paint shop owner
- School teacher
- District tuberculosis officer
- Zila Parishad Savadipati
- Non Governmental Organizations
- Volunteers from Nehru Yuva Kendra
- Shoe shop owner
- Tailor
- Cycle repair shop owner
- Mother of milk-co-operative worker
- Police man
- Postman
- Owner of house for servant
- Religious leader
- Anganwadi worker
- Ayurvedic doctor
- Private pharmacist

The principles of DOTS were developed in India. In the 1950s and 1960s, studies at the Tuberculosis Research Centre, Chennai demonstrated the safety and efficacy of domiciliary treatment of tuberculosis, effectiveness of intermittent chemotherapy, and the necessity and feasibility of direct observation of treatment. In the 1960s, studies at the National Tuberculosis Institute, Bangalore documented the efficacy, feasibility and importance of case detection by sputum microscopy.

DOTS if implemented correctly can prevent multidrug resistance. DOTS is also effective among HIV-infected patients.

Private doctor's wife
 Fisherman
 Milk co-operative union worker
 Watchman of the factory
 Hotel manager
 Lift attendant
 Swarnajayanti volunteer
 Self-help group member
 Tea garden leader
 Lawyer
 Deputy Sarpanch
 Mahila mandal
 Retired city government employee
 Barber
 Neighbour
 Alcoholic Anonymous volunteer
 NSS leader
 Senior citizen organization member
 Dhabawalla
 Dai
 Work-place supervisor
 Laboratory Technician from private laboratory
 Compounder from private practitioner
 Kirana shop owner
 Housewife
 Vegetable vendor

***“DOTS has been one of
 India's best exports.***

***It has been sent out into the
 world, tested, proven, and now
 it has come back to us, better
 than ever.”***

— Dr CV Ramakrishna, Former
 Deputy Clinical Director of the
 Tuberculosis Research Centre,
 Chennai

Direct observation ensures that patients take the right drugs, at the right intervals, and in the right dosages

NGO Involvement

Involvement of the community plays an important role in the successful implementation of the DOTS strategy. NGOs are often closer to and more trusted by patients and perform an active role in health promotion in the community. As they work in areas where access to health facilities is limited, they have a more important role to play in the RNTCP.

Depending on their area of expertise, NGOs can be involved in health education, service delivery, planning, programming, implementation, training and evaluation. The strategy for involving NGOs in the RNTCP includes inviting representatives to serve as members in district/state societies, providing literature and information on a regular basis, involving them in planning, implementation and evaluation of TB control programmes, and in training programmes.

Strong NGOs can play an important role in extending the reach and improving the efficacy of DOTS



Dr CP Thakur, Union Health Minister, delivering inaugural address at the National Conference of NGOs for involvement in RNTCP, January 2001

Representatives from NGOs during the workshop — National Conference of NGOs for involvement in RNTCP, January 2001



Strong NGOs can play an important role in extending the reach and improving the efficacy of DOTS and are particularly essential in areas where there is limited government infrastructure.



Dr CP Thakur, Union Health Minister, interacting with NGO representative during the National Conference of NGOs for involvement in RNTCP, January 2001

The Government of India has introduced various schemes for collaboration between NGOs and the RNTCP.

Scheme 1

Health education and community outreach. Train volunteers, disseminate information, counsel families and patients, and retrieve patients who have stopped treatment.

Scheme 2

Provision of directly observed treatment. Identify, train and supervise volunteers providing directly observed treatment.

Scheme 3

In-hospital care for tuberculosis disease. Provide smear microscopy for outpatients and hospital care for those who require it. Ensure adherence to diagnostic and treatment policies, and follow-up and record keeping.

Scheme 4

Microscopy and treatment centre. The NGO operates a designated microscopy and treatment centre as per RNTCP policy.

Scheme 5

TB Unit Model. Provides all RNTCP services of diagnosis, treatment, direct observation, defaulter retrieval, recording and registration, and supervision, for a Tuberculosis Unit (5 lakh population).



Dr CP Thakur, Union Health Minister, signing the TB Register after giving the last dose to cure a patient



Mr Ramapati Shastri, Cabinet Health Minister, Uttar Pradesh, giving the last dose to cure a TB patient



Mr Sardar Singh, Minister of State for Health, Uttar Pradesh, signing the TB register after giving the last dose to cure a TB patient

Improving the Programme



Patient-provider interaction meeting, Orissa

A good tuberculosis control programme uses scientific data to identify the problems of TB control and try out various interventions to solve these problems.

To succeed in the long-run, the programme must continuously evaluate its performance and search for ways to improve. Therefore, research in the area of tuberculosis is not a luxury, but is essential for the RNTCP. Several ambitious research initiatives are underway.

Annual risk of infection

The most recent systematic national survey of the burden of tuberculosis was conducted by the Indian Council of Medical Research from 1955 to 1958. It is crucial that the programme have information on the current epidemiology of tuberculosis and a means to track the effectiveness of programme interventions in the coming years. With this background, Government of India has undertaken to conduct a nation-wide representative sample survey of the annual risk of tuberculosis infection. The annual risk of infection is an excellent indicator of the burden of tuberculosis in a community. Furthermore, it provides a monitoring tool to assess the effectiveness of the programme in reducing the spread of tuberculosis. Under the leadership of the National Tuberculosis Institute, Bangalore, and with the active collaboration of the Tuberculosis Research Centre, Chennai and other centres throughout the country, research teams have fanned out to different districts throughout the country to conduct the annual risk of infection survey. It is an ambitious undertaking and will take several years to complete. However, with energetic leadership from the National Tuberculosis Institute, Bangalore, the survey is now mid-way through.

Drug resistance surveillance

Another important area of research is monitoring of drug resistance. Drug-resistant tuberculosis is a symptom of poor programme performance. It is important to document the level of drug resistance in the community in order to monitor the impact of the programme over time and also to ensure that treatment regimens are appropriate. In an effective programme, drug resistance is not created, and the prevalence of drug resistance should decrease with time.

The Tuberculosis Research Centre, Chennai, which is a WHO-recognized Centre of Excellence in mycobacteriology, is coordinating this multi-centric project. Results to date suggest that the rate of primary multidrug-resistant tuberculosis is less than 3% in most districts, and less than 1%–2% in many districts. The present rate of drug resistance in the country is of concern, but does not indicate the need for any change in RNTCP treatment policies. On the contrary, the presence of drug resistance makes the expansion of the RNTCP an even more urgent requirement.

The presence of drug resistance makes the expansion of the RNTCP an even more urgent requirement

Other priority research areas

Government of India has identified three additional priority areas for operational research. These are evaluation of the strengths and weaknesses of different types of treatment observers, evaluation of different models for participation of the private sector in the RNTCP, and evaluation of the usefulness and accuracy of the RNTCP diagnostic and treatment policies in HIV-infected persons.

TB hospitals

Research in the 1950s and 1960s at the Tuberculosis Research Centre, Chennai showed that hospitalization was not necessary for the treatment of TB. Admission to TB hospitals would be required only for treating complications or in very exceptional cases. The vast majority of TB patients require only ambulatory treatment. However, still there are more than 47 000 TB beds in 764 TB hospitals in the country. Although for a very limited number of patients hospitalization could be an important service, for most it is both unnecessary and expensive. To understand more about this important area, Government of India conducted a systematic survey of large TB hospitals.

Tuberculosis hospitals may diagnose as many as 10 lakh TB patients each year, including nearly 2.5 lakh who are sputum smear-positive. The national budget for all hospitals in the country may be as high as Rs 300 crore. This is more than the

total budget for the tuberculosis control programme of the country, yet diagnostic quality is poor, potentially dangerous treatment regimens are utilized, and outcomes are not evaluated.

TB hospitals can play an important role in case detection if standard diagnostic practices are followed as they have a good reputation and patients generally go to them for confirmation of diagnosis

TB hospitals have a good reputation and many patients go to them for confirmation of diagnosis. Therefore, TB hospitals can play an important role in case detection if standard diagnostic practices are followed. Beds should be utilized for only seriously ill TB patients and the remaining beds should be used for other purposes. The substantial credibility and caseloads of TB hospitals should be taken as an asset to ensure that patients are accurately diagnosed and are referred for evaluation and treatment as per policy.

Private practitioners

Most patients with TB are aware of their symptoms and go to the nearest health facilities; 50%–80% of patients first contact private practitioners. Private practitioners are generally convenient to and trusted by patients. Unfortunately, case management practices in the private health sector overly rely on X-ray and treatment strategies too often are based on unproved and untested regimens.

For the programme to broaden its reach and have maximal impact, the involvement of private practitioners assumes great importance. Some initial attempts at their involvement have shown encouraging results in some of the RNTCP sites. A project in collaboration with Delhi Medical Association is being implemented. Similarly, a mega project to involve private practitioners working in about 40 lakh population of East Delhi is being formulated. In order to improve coordination and communication with the private health sector, guidelines for collaboration between practicing physicians and the government are being developed.

Meanwhile:

All private practitioners can support and encourage effective tuberculosis control by:

- Ensuring prompt referral of patients with cough for 3 weeks or more;
- Providing reassurance that tuberculosis can be cured;
- Not starting treatment with rifampicin-containing regimens unless it can be ensured that treatment can be completed;
- Giving only recommended drug regimens.

In addition, **some** private practitioners may be able to:

- Serve as treatment observers for patients who prefer to receive treatment observation from them;
- Have their laboratories included in the quality control network of the RNTCP.

All District TB Officers have been encouraged to:

- Establish a line list of large private and non-government health facilities in the district, with some idea of the volume of patients and estimated number of TB patients catered by them.
- Foster cooperation and coordination at the local level. Personally visit each heavily utilized practitioner or facility in their area. At this visit, policies of the RNTCP should be explained in brief, concerns of the practitioner should be elicited and addressed, and practitioners should be encouraged to refer patients for sputum microscopy. In addition, a mechanism of feedback on patients referred should be established, and the practitioner's willingness to serve as DOT provider should be ascertained.



Private practitioners attending RNTCP CME session, Pimpri, Maharashtra

Medical Colleges

Medical colleges play a critical role in tuberculosis control for two reasons. First, as the medical opinion leaders and trend setters, medical college professors shape the attitudes of their peers and of the next generation of physicians. Second, because of their role as referral centres, medical colleges treat a large number of patients with tuberculosis.

Initially, some members of the medical college community expressed reservations about RNTCP policies. However, a National Consensus Conference was convened several years back to air

“ . . . Phased and effective implementation of the RNTCP is the best strategy, and perhaps the only chance of controlling TB in India during this generation. Ensuring diagnosis and cure of TB cases by RNTCP policies is the only effective way to stop the spread of multidrug-resistant TB in India. We, the tuberculosis experts, hereby call on all health professionals in public and private sectors to extend their full cooperation in implementing the RNTCP more widely in India. . . .”
— ***National Consensus Conference***

all issues. The Conference was attended by large number of experts from leading medical colleges throughout India, and Sir John Crofton as well as Professor John Sbarbaro also attended. At the Conference, it became clear that most reservations stemmed from lack of dissemination of knowledge from the programme, rather than disagreement with policies of the RNTCP. It was emphasized that the RNTCP is not a fixed dogma, but can and must adapt as experience is gained. Consensus was achieved:

In the past year, major steps have been taken to operationalize this consensus. Medical colleges have been requested to ensure standardized diagnosis and treatment of TB patients. Sensitization of medical college professors has been conducted at National Tuberculosis Institute, Bangalore and Tuberculosis Research Centre, Chennai.

In a new initiative, each medical college in an RNTCP area, working collaboratively with the District TB Officer, will establish a microscopy and treatment observation centre. Staff for microscopy and treatment observation as well as commodity assistance as per the actual need of each medical college, will be provided through the District TB Control Society. A medical officer on contract basis may be considered to be provided to ensure coordination and effective functioning. In this project, physicians from all the major OPDs of the medical college will refer all patients with cough of 3 weeks or more to the microscopy centre. The medical college physicians will follow the diagnostic algorithm and standardized treatment policies as per the RNTCP for patients living in RNTCP areas. Staff will also ensure proper referral of patients who reside outside the area of the medical college.

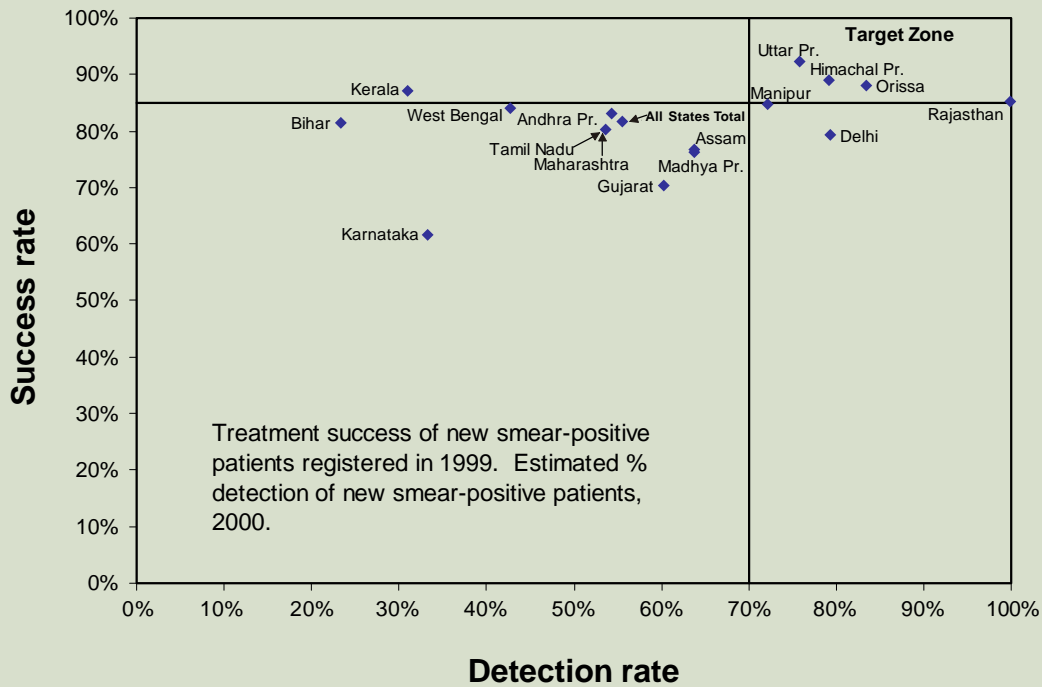
The most important aspect in preventing default is how the patient is treated when he comes to the clinic: kindness, education, patience and systematic follow-up by cohort analysis.

— Sir John Crofton, National Consensus Conference, New Delhi, India

Working together, the medical colleges and the RNTCP will ensure not only improved training and education in tuberculosis for the staff, but also improved and better-coordinated services for patients.

Annex

Case detection (2000) and success rates (1999) in RNTCP areas



Recent Articles on TB in India

Agarwal SP. **TB across the globe. Tuberculosis in India—the past and prospects for the future.** Scottish Medical Journal 2000;45 (Suppl):11-13.

Every year, India has more than 2 million new cases of tuberculosis and nearly 500,000 deaths from the disease – more than 1,000 deaths per day, 1 every minute.

Tuberculosis remains, by far, the leading infectious cause of death in the country. The emergence and spread of HIV and drug-resistant tuberculosis threatens to further complicate the tuberculosis situation.

— Dr SP Agarwal, Director General of Health Services

Arora VK, Sarin R. **Revised National Tuberculosis Control Programme: Indian perspective.** Indian Journal of Chest Diseases and Allied Sciences 2000;42:21-26.

Balasubramanian VN, Oommen K, Samuel R. **DOT or not? Direct observation of anti-tuberculosis treatment and patient outcomes, Kerala State, India.** International Journal of Tuberculosis and Lung Disease 2000;4:409-413.

A substantial proportion of patients in a DOTS programme—more than one fourth—did not actually receive treatment under observation. Advanced age/infirmity and fear of social stigma were the primary reasons given for not participating in DOT. Of patients who did not receive DOT, 26% had treatment failure and 19% had relapse, while among patients who received DOT, less than 3% had relapse or failure (24/53 [46%] vs. 4/147 [3%], relative risk 16.6; 95% confidence intervals 6–46, $p < 0.001$). Patients not receiving DOT accounted for 86% of relapses and failures under programme conditions.

In this study, as in other clinical trials and well-functioning DOTS programmes, more than 90%–95% of patients who actually received DOT had relapse-free cure.

To be maximally effective, the DOTS programme must be both confidential and convenient.

— Dr VN Balasubramanian, DTO, Pathanamthitta, Kerala

- Bhattacharyya P. Current recommendations of chemotherapy and pharmacology of antituberculosis drugs.** Journal of the Indian Medical Association 2000;98:119-122, 129.
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- Crofton J. Good news from India.** International Journal of Tuberculosis and Lung Disease 2000;4:189-190.
- Das RK. Tuberculosis—historical landmarks.** Journal of the Indian Medical Association 2000;98:112-114.
- Frieden TR. Directly observed treatment, short-course (DOTS): ensuring cure of tuberculosis.** Indian Journal of Pediatrics 2000;67(Suppl):S21-S27.
- Ganguly D. Tuberculosis—triumphs and tragedies.** Journal of the Indian Medical Association 2000;98:96.
- Ghoshal AG, Roy PP. Diagnosis of tuberculosis.** Journal of the Indian Medical Association 2000;98:115-118.
- Harris KA, Mukundan U, Musser JM, Kreiswirth BN, Lalitha MK. Genetic diversity and evidence for acquired antimicrobial resistance in *Mycobacterium tuberculosis* at a large hospital in South India.** International Journal of Infectious Disease 2000;4:140-147.
- Hemvani N, Chitnis DS, Bhatia GC, Soni N. Bacteriological study on pulmonary and extra-pulmonary cases of tuberculosis from central India.** Indian Journal of Medical Sciences 2000;54:188-196.
- Khatri GR. The Revised National Tuberculosis Control Programme: A status report on first 1,00,000 patients.** Indian Journal of Tuberculosis 1999;46:157-166.

*Results of
treatment
have been most
encouraging
— Sir John
Crofton*

Khatri GR, Frieden TR. **The status and prospects of tuberculosis control in India.** International Journal of Tuberculosis and Lung Disease 2000;4:193-200.

Since 1993, India has successfully implemented a TB control programme using principles for diagnosis and treatment which were documented in India, and which are now recommended by WHO as DOTS.

The key challenge in the years ahead will be to balance the urgent need for rapid expansion with paramount importance of ensuring quality of implementation.

— Dr GR Khatri, Deputy Director General (TB)

Prabhakar R. **Tuberculosis control in India—past, present and future.** Journal of the Indian Medical Association 2000;98:123-125.

Prasad S. **Scourge of tuberculosis.** Journal of the Indian Medical Association 2000;98:130.

Samal S, Gupta U, Agarwal P. **Menstrual disorders in genital tuberculosis.** Journal of the Indian Medical Association 2000;98:126-127, 129.

Sharma SK, Ahluwalia G. **HIV and tuberculosis.** Indian Journal of Chest Diseases and Allied Sciences 2000;42:77-81.

Sharma SK, Saha PK, Dixit Y, Siddaramaiah NH, Seth P, Pande JN. **HIV seropositivity among adult tuberculosis patients in Delhi.** Indian Journal of Chest Diseases and Allied Sciences 2000;42:157-160.

Singh M, Jayanthi S, Kumar L. **Drug resistant tuberculosis.** Indian Journal of Pediatrics 2000;67(Suppl):S41-S46.

Swaminathan S, Ramachandran R, Baskaran G, et al. **Risk of development of tuberculosis in HIV-infected patients.** International Journal of Tuberculosis and Lung Disease 2000;4:839-844.

Talwar BS, Talwar R, Chowdhary B, Prasa P. **Abdominal tuberculosis in children: an Indian experience.** Journal of Tropical Pediatrics 2000;46:368-370.

Vijayalakshmi V, Murthy KJ. **BCG vaccine—current status.** Journal of the Indian Medical Association 2000;98:110-111, 114.

Vijayan VK. **Disseminated tuberculosis.** Journal of the Indian Medical Association 2000;98:107-109.

Performance of the RNTCP

Performance of STATES

Provisional figures as of March 2001

State	Popn covered (in lakhs) by RNTCP by 31.12.00	% of state covered by RNTCP by 31.12.00	Total cases treated in 2000	New S +ve cases treated in 2000	Annual detection rate		Ratio of S +ve patients to S -ve patients	3-month conversion rate of New S+ve patients	Success rate of New S+ve patients
					New S +ve patients*	Total cases treated*			
Andhra Pradesh	58	8%	6444	2632	45	111	0.8	87%	83%
Assam	12	5%	1440	649	54	120	0.5	83%	78%
Bihar	110	15%	4698	1567	20	61	1.0	94%	82%
Delhi	118	100%	23907	7979	68	203	0.7	85%	80%
Gujarat	380	81%	34849	14082	51	139	0.6	84%	71%
Haryana	48	24%	4161	1589			0.8	80%	
Himachal Pradesh	43	72%	6098	2319	68	190	0.6	92%	89%
Karnataka	141	28%	6035	2661	28	66	0.6	87%	62%
Kerala	319	100%	15652	6699	27	62	0.6	88%	88%
Madhya Pradesh	40	8%	5216	1988	54	142	1.0	85%	77%
Maharashtra	282	32%	26575	8677	46	140	1.2	86%	81%
Manipur	10	50%	1759	614	61	176	1.2	93%	85%
Orissa	69	20%	9632	4385	71	158	0.7	91%	89%
Rajasthan	497	96%	39919	16984	89	220	0.7	89%	85%
Tamil Nadu	225	37%	14985	5644	46	121	0.9	81%	81%
Uttar Pradesh	189	13%	14756	6093	64	154	0.8	86%	93%
West Bengal	330	43%	29009	10529	36	99	1.1	87%	84%
Total	2871⁺	30%	245135	95091	47*	126*	0.8	87%	82%

* Rate calculations include only districts implementing for all of 2000

⁺ Some districts which began implementing in December 2000 will report starting in 2001

Performance of all RNTCP DISTRICTS

Provisional figures as of March 2001

Conversion rate available during second quarter of implementation. Cure and success rates available after four quarters of implementation.

District	Popn covered (in lakhs) by RNTCP by 31.12.00	Total cases treated in 2000	New S +ve cases treated in 2000	Annual detection rate		Ratio of S +ve to S -ve patients	3 month conversion rate of New S+ve patients	Cure rate of New S+ve patients	Success rate of New S+ve patients
				New S +ve patients*	Total cases treated*				
ANDHRA PRADESH									
Hyderabad	35	4020	1479	42	115	0.8	89%	83%	84%
Medak	23	2424	1153	51	107	0.7	85%	74%	80%
ASSAM									
Dibrugarh	12	1440	649	54	120	0.5	83%	78%	78%
BIHAR									
Palamau	16	123	58			0.6	83%		
Patna	44	2195	653	15	50	1.2	93%	71%	75%
Ranchi	27	454	159			1.1	93%		
Vaishali	24	1926	697	29	81	0.8	96%	90%	90%
DELHI									
Gulabi Bagh	10	1099	430	43	110	0.4	87%	86%	86%
Jhandewalan	4	869	239	60	217	1.1	84%	75%	76%
Kingsway	7	1448	540	77	207	0.4	90%	80%	81%
Karawal Nagar	11	3211	951	86	292	0.8	87%	79%	87%
LRS	10	1938	652	65	194	0.6	82%	84%	85%
Moti Nagar	22	5865	1800	82	267	0.8	86%	78%	78%
NDTC	4	700	240	60	175	0.5	93%	83%	83%
NDMC	4	380	127	32	95	0.6	93%	83%	84%
Narela	3	650	214	71	217	1.1	89%	86%	86%
Nehru Nagar	14	2183	755	54	156	0.8	87%	81%	81%
Patparganj	7	1427	508	73	204	0.6	80%	67%	67%
RK Mission	7	1347	496	71	192	0.6	83%	78%	81%
Shahadra	10	2006	700	70	201	0.7	83%	76%	76%
SPM Marg	5	784	327	65	157	0.5	77%	72%	76%
GUJARAT									
AMC	32	6719	2124	66	210	0.9	81%	51%	59%
Ahmedabad	19	2151	840	44	112	0.8	93%	81%	82%

* Rate calculations include only districts implementing for all of 2000

Performance of all RNTCP Districts (*continued*)

District	Popn covered (in lakhs) by RNTCP by 31.12.00	Total cases treated in 2000	New S +ve cases treated in 2000	Annual detection rate		Ratio of S +ve to S -ve patients	3 month conversion rate of New S+ve patients	Cure rate of New S+ve patients	Success rate of New S+ve patients
				New S +ve patients*	Total cases treated*				
GUJARAT (<i>continued</i>)									
Amreli	14	900	321	23	63	0.7	77%	57%	60%
Anand	18	1391	637			0.3	78%		
Banaskantha	27	1708	647			0.7	84%		
Bhavnagar	25	522	256			0.6	68%		
Dahod	15	1335	596			0.3	88%		
Jamnagar	16	2321	803	50	145	0.6	85%	73%	76%
Junagarh	28	1836	828			0.4	77%		
Mansa	15	2477	949	63	165	0.9	93%	86%	86%
Mehsana	16	1897	772	48	119	0.7	92%	84%	85%
Nadiad(Kheda)	20	1331	720			0.4	79%		
Panchmahals	20	1931	904			0.5	88%		
Rajkot	27	2005	759			0.6	87%		
Sabarkanth	19	1899	741			1.1	94%		
Surat MC	22	506	300			0.4	81%		
Surat	11	619	309			0.5	80%		
Valsad	24	2595	1186	49	106	0.4	77%	60%	63%
Vyara(Surat)	11	706	390			0.6	75%		
HIMACHAL PRADESH									
Hamirpur	4	918	353	88	230	0.7	92%	92%	92%
Kangra	13	2199	803	62	169	0.7	93%	89%	89%
Mandi	10	2023	667	67	202	0.7	90%	88%	88%
Solan	5	254	182			0.2	96%		
Shimla	7	412	186			0.3	96%		
Sirmaur	4	292	128			0.2	83%		
HARYANA									
Faridabad	20	1898	604			1.4	83%		
Gurgaon	15	1438	607			0.4	80%		
Sonipat	13	825	378			0.5	78%		
KARNATAKA									
Bijapur	19	358	196			0.4	87%		
Bagalkot	15	381	168			0.7	100%		
Bangalore C	36	2458	1012	28	68	0.7	89%	60%	60%
Bangalore U	11	663	316	29	60	0.6	83%	60%	73%
Bellary	19	19	11			0.7			

* Rate calculations include only districts implementing for all of 2000

Performance of all RNTCP Districts (*continued*)

District	Popn covered (In lakhs) by RNTCP by 31.12.00	Total cases treated in 2000	New S +ve cases treated in 2000	Annual detection rate		Ratio of S +ve to S -ve patients	3 month conversion rate of New S+ve patients	Cure rate of New S+ve patients	Success rate of New S+ve patients
				New S +ve patients*	Total cases treated*				
KARNATAKA (<i>continued</i>)									
Chitradurga	15	64	46			0.2			
Koppal	12	26	14			0.4			
Raichur	15	2066	898			0.7	86%		
KERALA									
Allapuzha	23	14	8			0.8			
Ernakulum	33	1474	538			1.0	87%		
Idukki	12	4	2			0.0			
Kollam	26	1658	689			0.8	87%		
Kannoor	25	1674	670	27	67	0.6	93%	93%	93%
Kottayam	20	1465	672	34	73	0.5	88%	85%	88%
Kasaragod	11	416	234			0.2	84%		
Kozhikode	26	1110	401			1.0	86%		
Malappuram	35	1626	667	19	46	0.8	83%	87%	89%
Palakkad	28	1074	543			0.4	83%		
Pathanamthitta	12	766	353	30	64	0.4	92%	87%	87%
Thrissur	30	2108	899	30	70	0.6	89%	84%	87%
Thiruvananthapuram	32	1775	803	25	55	0.5	90%	83%	85%
Wayanad	7	488	220	31	70	0.5	87%	90%	90%
MADHYA PRADESH									
Bhopal	19	2334	922	50	126	0.9	85%	77%	77%
Rajgarh	10	950	366			1.0	85%		
Vidisha	11	1932	700	63	173	1.1	86%	54%	77%
MAHARASHTRA									
Mumbai	111	16404	4594	41	148	1.5	83%	74%	78%
Kolhapur	31	19	6			1.3			
Nasik	38	47	21			0.7			
Pimpri Chinchwad	7	1296	397	57	185	0.9	92%	90%	91%
Pune	16	2512	1101	69	157	0.5	90%	88%	89%
Pune Rural	34	3354	1453	43	99	0.9	93%	87%	87%
Raigad	21	2934	1105	53	142	1.0	89%	85%	86%
Satara	25	9	0						
MANIPUR									
Imphal	10	1759	614	61	176	1.2	93%	85%	85%

* Rate calculations include only districts implementing for all of 2000

Performance of all RNTCP Districts (*continued*)

District	Popn covered (in lakhs) by RNTCP by 31.12.00	Total cases treated in 2000	New S +ve cases treated in 2000	Annual detection rate		Ratio of S +ve to S -ve patients	3 month conversion rate of New S+ve patients	Cure rate of New S+ve patients	Success rate of New S+ve patients
				New S +ve patients*	Total cases treated*				
ORISSA									
Deogarh	2	222	83			0.9	70%		
Jharsuguda	4	557	261			0.5	83%		
Kheonjhar	15	1837	863	58	122	0.7	90%	85%	86%
Mayurbhanj	21	3313	1636	77	156	0.6	93%	88%	88%
Sambalpur	11	646	357			0.5	84%		
Sundargarh	16	3057	1185	76	196	0.9	95%	92%	92%
RAJASTHAN									
Ajmer	20	4232	2010	99	208	0.6	85%	66%	66%
Alwar	28	3145	1492			0.6	88%		
Bikaner	16	81	35			0.7			
Bhilwara	19	2970	1229			0.7	94%		
Bundi	9	359	185			0.6	100%		
Baran	10	345	123			0.8	86%		
Bharatpur	20	1853	755			0.8	89%		
Banswara	15	29	15			0.0			
Churu	19	639	282			0.4	75%		
Chittorgarh	18	111	37			0.4			
Dungarpur	12	84	50			0.0			
Dhaulpur	9	89	35			0.4			
Daussa	10	2046	818	82	206	0.7	92%	89%	89%
Ganganagar	16	116	31			1.7			
Hanumangarh	15	107	50			0.3			
Jodhpur	26	1775	688			1.0	84%		
Jhunjhunu	2	748	359			0.4	84%		
Jalor	15	62	27			0.5			
Jhalawar	12	43	18			0.3			
Jaipur	38	8818	3272	85	230	0.8	91%	86%	86%
Jaisalmer	4	30	9			0.7			
Karauli	12	492	213			0.3	100%		
Kota	15	610	179			1.4	88%		
Nagaur	27	2777	1205			0.7	89%		
Pali	20	1610	724			0.8	90%		
Raj Samand	10	398	187			0.4	100%		
Sikar	23	2200	1002			0.6	91%		
Sawai Madhopur	11	1492	647			0.6	91%		
Sirohi	8	26	18			0.2			
Tonk	12	1772	924			0.5	92%		
Udaipur	27	860	365			0.4	96%		

* Rate calculations include only districts implementing for all of 2000

Performance of all RNTCP Districts (continued)

District	Popn covered (in lakhs) by RNTCP by 31.12.00	Total cases treated in 2000	New S +ve cases treated in 2000	Annual detection rate		Ratio of S +ve to S -ve patients	3 month conversion rate of New S+ve patients	Cure rate of New S+ve patients	Success rate of New S+ve patients
				New S +ve patients*	Total cases treated*				
TAMIL NADU									
Chennai	45	4166	1713	38	93	0.8	85%	71%	75%
Cuddalore	24	3949	1328	56	165	0.9	91%	80%	88%
Dharmapuri	28	2131	651			1.5	53%		
Model DOTS	6	974	388	65	162	1.0	80%	71%	71%
Namakkal	15	862	356			0.8	86%		
Salem	30	694	349			0.2	93%		
Tiruchirapalli	24	641	329			0.5	70%		
Thanjavur	22	1556	529			1.1	52%		
Villupuram	31	12	1			3.0			
UTTAR PRADESH									
Barabanki	23	3117	1356	59	136	0.8	88%	92%	92%
Bcm Hospital Sitapur	0.5	146	44			0.5	83%		
Bagpat	12	453	173			1.0	82%		
Gautam Budhnagar	10	462	171			0.9	88%		
Ghaziabad	35	1565	649			0.7	78%		
Lucknow	27	4561	1850	69	169	0.7	89%	93%	93%
Meerut	31	1460	546			1.0	93%		
Rai Bareilly	24	1903	825			0.9	82%		
Unnao	26	1089	479			0.8	85%		
WEST BENGAL									
Bankura	31	272	148			0.5			
Calcutta	50	4371	1716	34	87	0.6	87%	84%	84%
Hoogly	47	5881	2176	46	124	1.1	90%	88%	89%
Howrah	42	3162	1047	25	75	1.3	76%	73%	75%
Jalpaiguri	32	1342	682			0.4	87%		
Murshidabad	52	6376	2417	46	123	1.2	87%	78%	89%
Malda	30	3905	1080	36	130	1.7	90%	72%	73%
Nadia	45	3700	1263	28	82	1.3	84%	78%	81%
TOTAL	2871*	245135	95091	47*	126*	0.8	87%	80%	82%

* Rate calculations include only districts implementing for all of 2000

* Some districts which began implementing in December 2000 will report starting in 2001

Tuberculosis Do and Don't

Do	Don't
<p>Have 3 sputum examinations done if you have cough of three weeks or more. These tests are done free of cost at Government sputum microscopy centres</p>	<p>Don't avoid medical care if you have cough of three weeks or more</p>
<p>Take all the medicines for the full prescribed period on regular basis</p>	<p>Don't rely only on X-ray for diagnosis of TB</p>
<p>Understand that TB can be cured</p>	<p>Don't stop medicines before your physician discontinues them</p>
<p>Cover your mouth when coughing or sneezing</p>	<p>Don't discriminate against TB patients</p>