stop TB

RNTCP disability management projects

In accordance with the continuing effort to address problems related to TB more comprehensively, the programme has branched out to address the issue of disability due to TB. Disability due to TB can be:

- Locomotor disability caused by extrapulmonary TB resulting from affliction of the musculoskeletal and/or nervous system
- Respiratory disability due to pulmonary TB in patients with extensive parenchymal damage and chronic pleural involvement.

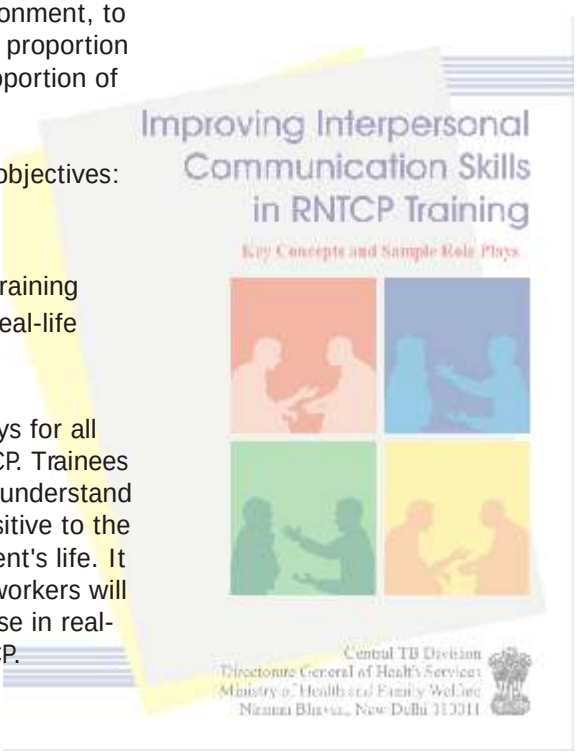
An action plan for implementing the disability management project on a pilot basis has been prepared. The disability management project will be able to reduce impairments and minimize the suffering caused by existing departures from good health. The districts of Jaipur, Imphal, Thiruvananthapuram, Patna and Mumbai have been identified for implementation of the project. Preparatory activities before service delivery include training of staff, coordinating with a general hospital where the Medical Rehabilitation Unit (MRU) is to be set up, identifying space and staff for the MRU and procuring gadgets and equipment for the Unit as well as for patients. Over 130 doctors have been trained under the project. MRUs have been established at Imphal, Jaipur and Thiruvananthapuram. So far, 57 patients have availed of the various services under the project. Two service delivery sites, one at Mumbai and the other at Patna are expected to start shortly.

Patient with extrapulmonary TB undergoing physiotherapy, Jaipur, Rajasthan

Use dots

Improved Interpersonal Communication in RNTCP

Interpersonal communication (IPC) skills are very important for the success of the programme. A training module for improved IPC skills has been prepared and incorporated in the training to help all categories of health workers. This module will help to create a patient-friendly environment, to enhance patients' compliance and to increase the proportion of patients that present for treatment and the proportion of those cured.



The module is expected to achieve the following objectives:

- Understand the importance of improved IPC
- Develop insights into one's own behaviour
- Practice good communication skills during the training
- Put good communication skills into practice in real-life situations.

The IPC training module is in the form of role-plays for all categories of health workers involved in the RNTCP. Trainees perform role-plays during the training in order to understand the patient's perspective and also to become sensitive to the social and cultural aspects that influence the patient's life. It is expected that through these role-plays health workers will learn good communication skills which they will use in real-life situations and add to the success of the RNTCP.

Quality Control of Diagnosis

Sputum microscopy is the cornerstone of the RNTCP both for diagnosis and follow-up of patients. Reliable laboratory microscopy results are essential for identification of infectious patients, proper categorization of patients, decision to start the continuation phase, and to declare patients as cured.

The microscopy quality in the RNTCP continues to improve. More than half the patients had laboratory confirmation of their disease (positive smears), compared with less than one in four in the previous programme. The Central TB Division, with inputs from National Institutes, developed a new protocol for quality assurance, incorporating blinded cross-checking of microscopy work, which was sent to all the states. Several states have already begun performing blinded proficiency testing of the districts by the State Training and Demonstration Centres (STDCs). The National Tuberculosis Institute (NTI), Bangalore and Tuberculosis Research Centre (TRC), Chennai are National Reference Centres for quality assurance and every six months prepare blinded quality control slides for evaluation of each of the 16 STDCs.

Schoolchildren performing a skit on TB in Tamil Nadu

Information, Education and Communication (IEC)

IEC activities in the RNTCP aim to improve the quality of TB patient care, promote better understanding of TB and its cure, and to reduce stigma. IEC activities at the national and state levels are complementary. While mass media activities are planned at the national level, state-level activities are more specific and need-based, with emphasis on sensitization of the health provider, production of state-specific IEC material, dissemination of this material to local levels and optimum use of folk media at the district levels. Effective, regular and consistent IEC activities are expected to enhance the performance of the RNTCP.

Rally of schoolchildren on World TB Day 2001 West Bengal

Research Activities

Dr P.R. Narayanan presenting the findings of operational research at TRC to the Union Minister for Health and Family Welfare, Padmashree Dr C.P. Thakur and Secretary of Health, Shri Javed Choudhary on 18 October 2001

stop TB

Research Dissemination Workshop

India's TB control programme must be supported by operational research that provides tools for continuous quality improvement. The goal is to improve the diagnosis, care and access for TB patients by translating the results of that research into policy. With financial support from the World Health Organization (WHO) and British Department for International Development (DFID), the Tuberculosis Research Centre conducted a workshop to disseminate findings of operational research conducted in India during the past 5 years. The workshop was attended by approximately 60 participants, which included RNTCP programmme officers, medical college professors, and representatives from TB research institutes and nongovernmental organizations. The participants discussed the implications of the research findings to date and recommended further research for improving private–public partnerships, care-seeking behaviour of chest symptomatics, effectiveness of DOT providers, and assessing the socioeconomic burden of TB.

Research Dissemination Workshop at TRC, Chennai on 16 and 17 March 2001

Annual Risk of Infection

To estimate the current annual risk of tuberculosis infection (ARI) in different regions of the country, the National Tuberculosis Institute, Bangalore in conjunction with the Tuberculosis Research Centre (TRC), Chennai initiated a countrywide survey in January 2000. The ARI is the most sensitive epidemiological indicator of the TB situation in the community as it expresses the overall impact of various factors affecting the transmission of the tubercle bacilli, i.e. the load of infectious cases in the community, duration of infectiousness and efficiency of case finding and treatment programmes. No epidemiological survey on TB of this magnitude has been conducted in India in the past except the national survey conducted by the Indian Council of Medical Research (ICMR) in the 1950s.

The survey is being conducted in 26 districts; eight in the East zone and six each in the North, South, and West zones. A total of about 165 000 children have been investigated till February 2002. The fieldwork is tentatively scheduled to conclude by the end of 2002. The analysis of the data pertaining to the North and South zones is at an advanced stage.

The survey results will provide information on the present epidemiological situation of TB in different parts of the country.

Use dots

Results of a large field trial started in 1968–70, and 15-year follow-up showed little decrease in the annual risk of infection (2% annually). The incidence of smear-positive TB decreased by only 2.3% per annum (157 to 113/100 000), approximately the same rate as population growth in this period. The prevalence of culture-positive tuberculosis decreased by only 1.4% per annum (870/100 000 in 1968–75 to 694/100 000 in 1984–86), and, reflecting the lack of effective treatment, there were 3.5 times as many prevalent cases as incident cases. In fact, "the ratio of prevalence to incidence increased steadily over time, as a symptom of ineffective treatment and 'pooling' of partially treated cases". Furthermore, even the slight decrease in cases was entirely due to a decrease in the development of TB in persons with abnormal radiographs at baseline, which "was likely due to a greater likelihood that subjects with radiographic abnormalities had received antituberculosis drugs, as treatment became more widespread". The study meticulously documents the continuing burden of TB and the need for effective control measures; the area has begun implementing the DOTS strategy, and the impact of DOTS on TB epidemiology will be documented in the years to come.

TRC. IJTLD, 2001, 5:142–157

Surveillance for Drug Resistance

Monitoring of drug resistance in TB programmes is an important indicator of programme performance in the community. Drug-resistant TB 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-Collaborating Centre for TB control, research and training in mycobacteriology, is coordinating this multicentric project. Preliminary results show the prevalence of MDR-TB to range from 1% to 3% among previously untreated patients. Among previously treated patients the prevalence was 5 times higher. These findings indicate the need for DOT and the need to achieve high cure rates among new patients.

The possibility of increase in drug resistance in patients receiving short-course treatment was explored. If patients resistant to isoniazid develop resistance to rifampicin during short-course treatment, TB treatment would become very difficult. This study reports the response of treatment, relapse rates and emergence of drug resistance of several trials at the TRC, Chennai. Patients were treated with short-course chemotherapy. Of 1817 patients, 320 (17.6%) had initial drug resistance, of which 58 (3.2%) had MDR-TB. Response to treatment was not influenced by the duration of previous anti-tuberculosis treatment. Relapse rates were higher among patients with drug resistance (13% vs 7%). Patients whose isolates were initially resistant to isoniazid had more failures compared to patients with drug-susceptible organisms (19% vs 2%). However, of the 320 patients who had drug-resistant organisms, 260 (81%) had a favourable response. Emergence of resistance to isoniazid, rifampicin or both occurred in only 1% of patients with drug-susceptible organisms and in 11% of patients with organisms resistant to isoniazid. Overall, the emergence of resistance to rifampicin was only 2%, despite a high level of isoniazid resistance. The study concludes that standard short-course treatment can safely and effectively treat sputum-positive pulmonary TB patients with minimal emergence of rifampicin resistance.

TRC. IJTLD, 2001, 5:40–45

stop TB

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Missed opportunities for diagnosis of pulmonary TB: a study among rural patients seeking relief on their own under the TB programme in India

Chest symptomatics in the community reportedly shop around, seeking relief at various health facilities, before they are diagnosed as tuberculosis cases and put on appropriate treatment. This investigation explored the delay in seeking care on the part of the patient following chest symptoms (patient delay), time taken for diagnosis as TB and starting treatment, following his/her first action to seek relief from symptoms (health system delay), reasons for patients shifting from one health facility to another prior to diagnosis, and expenditure incurred by patients before diagnosis. The participants were from an NTP area and an RNTCP area. Patient delay was similar in the two areas but there was a significant reduction in health system delay in the RNTCP area (1.8 months vs 0.7 months, $p \leq 0.05$), probably due to efficiency of the health services. Expenditure incurred was significantly less in the RNTCP area compared to the NTP area ($p<0.05$). Patients had to make a number of visits (mean of 12 visits per patient), but these were less in the RNTCP area. The DTC diagnosed 58.5% of cases, 9% were diagnosed at other government facilities and 20% by traditional medicine practitioners.

The study concludes that there is considerable delay in the diagnosis of TB patients even after the onset of symptoms and is independent of age, sex, educational status or income. It is suggested that wider distribution and upgradation of diagnostic facilities are required to minimize the missed opportunities for diagnosis of TB. Service delivery facilities should include traditional medicine practitioners, other government health institutions and private practitioners who contribute towards increasing the available diagnostic opportunities.

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Use dots

Socioeconomic impact of parental tuberculosis on children

The impact of parental pulmonary TB on children was examined from a larger study of socioeconomic effects of the disease. The effect on children was studied in respect of (i) socioeconomic and demographic characteristics of the parents (who were patients), (ii) the child care functions of mothers who were patients, and (iii) effect on children's education.

In all, 276 children of 167 tuberculous parents were studied. Child caring on the part of mothers fell from 64% to 35% for rural females and from 74% to 33% for urban females; 11% of children (8% rural, 13% urban) dropped out of school; 34% of the study parents could not buy school books or adequate food because of loss of income and 20% of the children were obliged to take up jobs in order to supplement income.

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Public–private partnership in tuberculosis control: experience in Hyderabad, India

This study aimed to determine whether private practitioners and the government can collaborate with a nongovernmental intermediary to implement DOTS effectively. A non-profit hospital provided DOTS services to a population of 100 000 for 3 years, then expanded coverage to 500 000 in October 1998. After diagnosis, patients received directly observed treatment free of charge at the trust hospital or at 30 conveniently located small hospitals. No financial incentives were used. Medicines and laboratory reagents were provided by the government.

Of 2244 persons referred, 969 (43%) had TB. The detection rate increased from 50 to 200/100 000 over the first 2–3 years of the project, and has increased gradually since expansion; 90% of new smear-positive patients and 77% of re-treatment patients were successfully treated. Compared with those treated at a neighbouring government DOTS centre, patients in this project paid less for diagnosis and treatment. Collaborative efforts between private practitioners and the government can achieve moderately high rates of case detection and high rates of treatment success. Public–private services appeared to be more convenient to patients.

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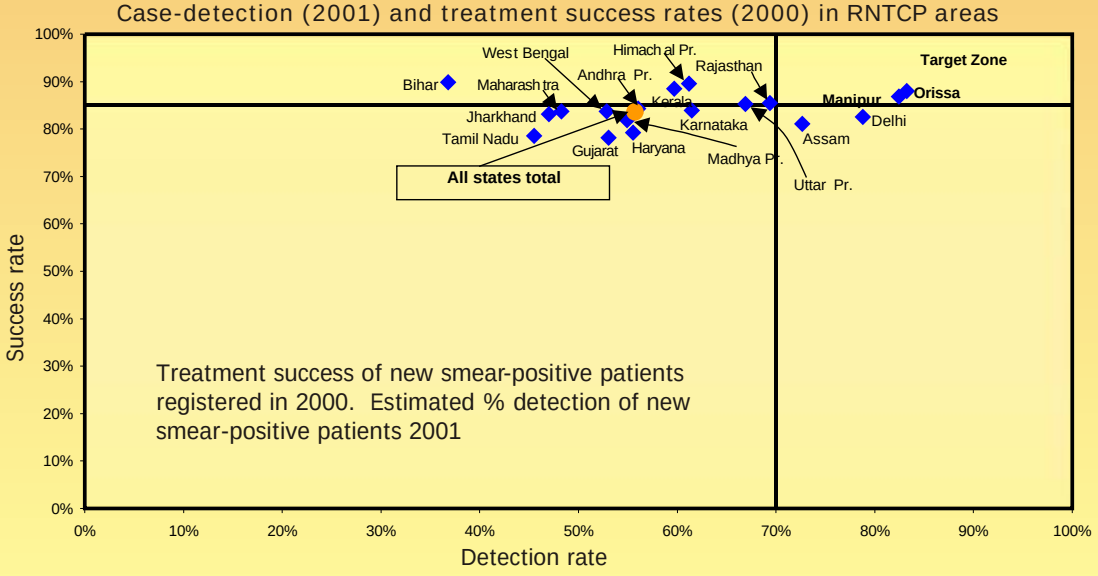
National Tuberculosis Institute, Bangalore

Performance of the RNTCP

Case detection rate in RNTCP areas—2001

Case-detection (2001) and treatment success rates (2000) in RNTCP areas



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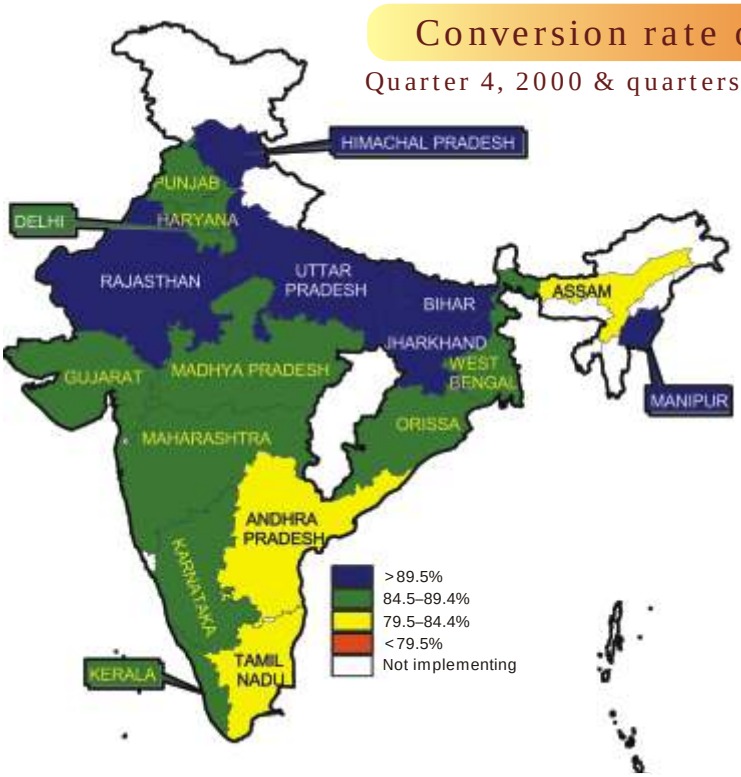
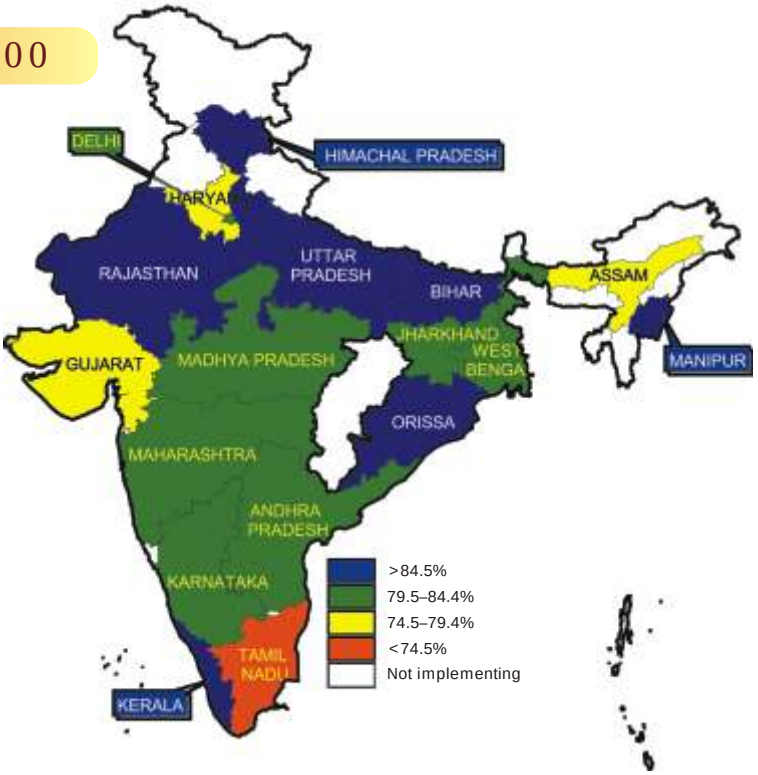
Conversion rate of India

Quarter 4, 2000 & quarters 1-3, 2001



Cure rate of India, 2000



Use dots

Performance of states

Case Finding (2001), Smear Conversion (4th quarter 2000 and quarters 1-3, 2001) and Treatment Outcomes (2000)

State	Popn covered in lakhs by 31.12.01	Total cases treated	Annual total detection rate *	New S+ve cases treated	Annual new S+ve detection rate *	Proportion of estimated new S+ve cases detected**	Ratio S-ve to S+ve patients	3-month conversion rate of new S+ve patients	Success rate of new S+ve patients
Andhra Pradesh	255	22745	104	10472	48	56%	0.8	82%	84%
Assam	12	1629	139	724	62	73%	0.6	83%	81%
Bihar	112	8822	79	3493	31	37%	0.8	95%	90%
Delhi	138	26380	196	8744	67	79%	0.7	88%	83%
Gujarat	461	50551	117	19635	45	53%	0.7	87%	78%
Haryana	51	6655	130	2422	47	56%	0.9	86%	79%
Himachal Pradesh	56	9762	188	3674	70	61%	0.6	93%	90%
Jharkhand	49	4443	91	1948	40	47%	0.9	92%	83%
Karnataka	199	20959	113	9646	52	61%	0.7	86%	84%
Kerala	318	22590	71	9500	30	60%	0.6	89%	89%
Madhya Pradesh	65	6472	133	2261	47	55%	1.2	87%	82%
Maharashtra	678	56885	120	19818	41	48%	1.0	88%	84%
Manipur	8	1767	212	687	82	82%	0.8	93%	87%
Orissa	108	14060	149	6835	71	83%	0.6	89%	88%
Punjab	18	637		276			0.2	86%	
Rajasthan	565	84557	150	33304	59	69%	0.7	90%	85%
Tamil Nadu	603	46546	103	17428	39	45%	1.0	84%	79%
Uttar Pradesh	206	28057	136	11727	57	67%	0.8	91%	85%
West Bengal	600	58141	119	22584	45	53%	0.9	86%	84%
Grand Total	**4503**	**471658**	**121**	**185178**	**47**	**56%**	**0.8**	**88%**	**84%**

* Rate calculations include only districts implementing for all of 2001

** Estimated new smear-positive cases adjusted for available data on annual risk of infection for Kerala (50/lakh), Himachal Pradesh (115/lakh) and Manipur (100/lakh)

stop TB

Performance of Districts

Case Finding (2001), Smear Conversion (4th quarter 2000 and quarters 1–3, 2001) and Treatment Outcomes (2000)

District	Popn (lakhs)	Total cases treated	Annual total detection rate *	New S+ve cases treated	Annual new S+ve detection rate *	Ratio 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
ANDHRA PRADESH									
Anantapur	36	3421	94	1552	43	0.8	70%		
Chittoor	37	2106		1010		0.6	64%		
Hyderabad	37	4478	121	1644	45	0.8	85%	83%	83%
Mahbubnagar	35	3586	102	1836	52	0.7	72%		
Medak	27	2632	99	936	35	1.4	85%	79%	86%
Rangareddi	35	1977	56	1062	30	0.5	86%		
Srikakulam	25	685		296		1.2	100%		
Vizianagaram	22	3860	172	2136	95	0.7	96%		
ASSAM									
Dibrugarh	12	1629	139	724	62	0.6	83%	78%	81%
BIHAR									
Muzaffarpur	36	2669	71	755	20	1.1	91%		
Patna	47	3450	73	1512	32	0.8	96%	89%	89%
Vaishali	27	2703	100	1226	45	0.7	95%	90%	90%
DELHI									
BJRM Chest Clinic	3	163		44		0.6			
DDU Chest Clinic	7	2048		429		1.4	82%	74%	78%
GTB Chest Clinic	8	1024		364		0.4	82%	85%	85%
Gulabi Bagh	9	1228	136	415	46	0.6	91%	89%	89%
Jhandewalan	5	778	156	197	39	1.1	93%	84%	84%
Karawal Nagar	9	2264	252	890	99	0.7	87%	78%	83%
Kingsway	4	1698	425	579	145	0.5	96%	88%	88%
LN Chest Clinic	3	259		81		0.6	81%		
LRS	16	2942	184	1012	63	0.5	86%	83%	83%
Moti Nagar	5	2240	448	654	131	0.9	89%	81%	82%
Narela	5	683	137	238	48	0.7	95%	82%	82%
NDMC	4	414	104	145	36	0.6	88%	87%	87%
NDTC	2	673	337	201	101	0.6	89%	88%	89%
Nehru Nagar	18	2290	127	861	48	0.7	86%	78%	78%

* Rate calculations include only districts implementing for all of 2001

Performance of Districts (continued)

District	Popn (lakhs)	Total cases treated	Annual total detection rate *	New S+ve cases treated	Annual new S+ve detection rate *	Ratio 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
DELHI (continued)									
Patparganj	7	1490	213	528	75	0.7	85%	78%	78%
RK Mission	8	1255	157	412	52	0.7	88%	83%	83%
RTRM Chest Clinic	4	500		143		0.7	83%	81%	81%
SGM Chest Clinic	8	1847		652		0.6	91%	83%	84%
Shahadra	8	1758	220	579	72	0.7	87%	84%	84%
SPM Marg	5	826	165	320	64	0.5	85%	72%	73%
GUJARAT									
Ahmadabad	23	2429	106	898	39	0.9	94%	88%	88%
AMC	35	7266	207	2070	59	0.8	84%	68%	70%
Amreli	14	1130	81	425	31	0.6	90%	72%	74%
Anand	19	2405	130	1143	62	0.5	82%	73%	73%
Banas Kantha	27	2846	104	942	34	0.9	85%	79%	79%
Bhavnagar	25	1997	81	792	32	0.5	76%	58%	61%
Dahod	16	2268	139	960	59	0.5	92%	81%	83%
Gandhinagar	8	499		202		0.9	87%		
Jamnagar	19	1989	104	777	41	0.6	85%	77%	80%
Junagadh	30	3035	102	1291	43	0.6	81%	73%	75%
Kheda	20	2484	123	1015	50	0.5	86%	71%	72%
Mahesana	17	1930	115	758	45	0.8	94%	86%	87%
Mansa-Gj	16	2310	142	890	55	0.9	93%	87%	87%
Panch Mahals	20	3638	180	1432	71	0.7	91%	78%	78%
Rajkot	32	2872	91	1159	37	0.6	89%	79%	80%
Sabar Kantha	21	3382	162	1167	56	1.3	90%	87%	89%
Surat	15	914	60	495	33	0.5	92%	83%	84%
Surat Municipal Corp	24	1042	43	439	18	0.8	87%	77%	77%
Surendranagar	15	123		62		0.2			
Vadodara	14	920		471		0.4	86%		
Vadodara Corp	13	1063		399		0.8	85%		
Valsad	26	2558	97	1104	42	0.5	85%	75%	75%
Vyara (Surat)	10	1451	138	744	71	0.6	76%	70%	76%
HARYANA									
Faridabad	22	2978	136	1105	50	0.9	89%	83%	84%
Gurgaon	17	2170	131	747	45	0.8	81%	68%	73%
Sonipat	13	1507	118	570	45	0.9	86%	80%	81%

* Rate calculations include only districts implementing for all of 2001

Performance of Districts (continued)

District	Popn (lakhs)	Total cases treated	Annual total detection rate *	New S+ve cases treated	Annual new S+ve detection rate *	Ratio 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
HIMACHAL PRADESH									
Bilaspur-Hp	3	380		169		0.4	93%		
Hamirpur-Hp	4	910	221	387	94	0.6	94%	88%	88%
Kangra	13	2195	164	772	58	0.7	94%	91%	91%
Kinnaur	1	6		2		1.0			
Kullu	4	714		254		0.7	89%		
Lahul & Spiti	0.3	69	208	27	81	0.8	88%		
Mandi	9	2348	261	838	93	0.5	91%	90%	90%
Shimla	7	1053	146	321	44	1.0	97%	89%	89%
Sirmaur	5	814	178	345	75	0.3	93%	85%	85%
Solan	5	802	161	380	76	0.3	94%	89%	89%
Una	4	471		179		0.8	92%		
JHARKHAND									
Palamu	21	2216	106	1083	52	0.7	92%	75%	75%
Ranchi	28	2227	80	865	31	1.1	92%	85%	85%
KARNATAKA									
Bagalkot	17	1842	111	911	55	0.8	87%	82%	82%
Bangalore City	50	3527	70	1383	28	0.7	88%	85%	85%
Bangalore U	15	1057	70	540	36	0.5	90%	82%	82%
Bellary	20	3509	173	1675	83	0.8	74%	64%	73%
Bijapur	18	1735	96	788	44	0.6	87%	75%	75%
Chitradurga	15	2604	172	1251	83	0.5	88%	72%	78%
Davanagere	18	959		372		1.0	74%		
Koppal	12	1612	135	817	68	0.6	89%	86%	86%
Mandya	18	1552		725		0.8	78%		
Raichur	16	2562	155	1184	72	0.7	94%	86%	86%
KERALA									
Alappuzha	21	1456	69	565	27	0.9	72%	100%	100%
Ernakulam	31	2973	96	1107	36	0.9	89%	87%	88%
Idukki	11	432	38	186	16	0.5	85%	100%	100%
Kannur	24	1909	79	771	32	0.6	91%	91%	91%
Kasaragod	12	645	54	311	26	0.4	88%	86%	86%
Kollam	26	2066	80	968	37	0.6	91%	89%	89%
Kottayam	20	1739	89	735	38	0.7	87%	88%	88%
Kozhikode	29	1932	67	680	24	0.9	89%	83%	86%

* Rate calculations include only districts implementing for all of 2001

Performance of Districts (continued)

District	Popn (lakhs)	Total cases treated	Annual total detection rate *	New S+ve cases treated	Annual new S+ve detection rate *	Ratio 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
KERALA (continued)									
Malappuram	36	1768	49	757	21	0.6	88%	89%	91%
Palakkad	26	2064	79	894	34	0.6	89%	86%	86%
Pathanamthitta	12	776	63	386	31	0.3	92%	90%	90%
Thiruvananthapuram	32	1996	62	860	27	0.6	92%	91%	91%
Thrissur	30	2358	79	1055	35	0.4	90%	86%	86%
Wayanad	8	476	61	225	29	0.4	90%	91%	91%
MADHYA PRADESH									
Bhopal	18	2474	135	864	47	1.1	91%	84%	84%
Raisen	11	284		108		1.0	82%		
Rajgarh	13	1419	113	532	42	1.0	86%	79%	83%
Sehore	11	466		144		1.3	84%		
Vidisha	12	1829	151	613	50	1.3	82%	77%	79%
MAHARASHTRA									
Ahmednagar	41	1596		517		1.2	84%		
Aurangabad-Mh	20	1751	86	679	33	1.0	92%		
Aurangabad Mun Corp	9	682		271		0.7	91%		
Bid	22	117		51		0.5			
Dhule	17	948		404		1.1	90%		
Jalgaon	37	2130		778		0.9	82%		
Jalna	16	891		413		0.5	90%		
Kolhapur	30	3063	101	1036	34	1.2	88%	100%	100%
Kolhapur Mun Corp	5	413		137		1.1	89%		
Latur	21	519		173		0.9	75%		
Mumbai	119	17764	149	5228	44	1.2	88%	80%	81%
Nasik	39	4311	111	1690	44	0.9	93%	67%	67%
Nasik Corp	11	780	70	238	21	1.1	79%		
Navi Mumbai	7	1219	173	396	56	1.4	76%		
Osmanabad	15	158		54		1.0			
Pimpri Chinchwad	10	1431	142	486	48	0.7	93%	91%	91%
Pune	25	2799	110	1160	46	0.5	91%	88%	88%
Pune Rural	37	3607	98	1388	38	0.9	92%	86%	86%
Raigarh-Mh	22	3020	137	1199	54	1.0	91%	85%	86%
Ratnagiri	17	748		333		0.8	75%		
Sangli	21	2184	102	690	32	1.1	84%		

* Rate calculations include only districts implementing for all of 2001

Performance of Districts (continued)

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MAHARASHTRA (continued)									
Sangli Muni Corp	4	356		109		0.9	69%		
Satara	28	2514	90	956	34	1.0	84%		
Sindhudurg	9	331		89		1.7	100%		
Solapur	30	132		61		0.7			
Solapur Muni Corp	9	72		17		1.6			
Thane	45	1701		684		0.9	88%		
Thane Muni Corp	13	1648	131	581	46	0.8	79%		
MANIPUR									
Imphal	8	1767	212	687	82	0.8	93%	87%	87%
ORISSA									
Debagarh	3	262	96	118	43	0.6	92%	84%	86%
Jharsuguda	5	778	153	316	62	0.7	93%	82%	82%
Kendujhar	16	1862	119	879	56	0.7	89%	85%	85%
Koraput	12	671		392		0.3	90%		
Malkangiri	5	614		298		0.6	70%		
Mayurbhanj	22	3632	163	1847	83	0.6	92%	89%	89%
Nabarangapur	10	612		379		0.3	82%		
Rayagada	8	1425	173	813	99	0.3	75%		
Sambalpur	9	1041	112	503	54	0.6	87%	82%	83%
Sundargarh	18	3163	173	1290	71	0.8	96%	92%	92%
PUNJAB									
Patiala	18	637		276		0.2	86%		
RAJASTHAN									
Ajmer	22	3751	172	1543	71	0.6	92%	81%	82%
Alwar	30	4217	141	1893	63	0.7	86%	79%	82%
Banswara	15	2343	156	983	66	0.7	95%	87%	87%
Baran	10	1536	150	563	55	0.6	93%	90%	90%
Barmer	20	1780	91	654	33	1.0	85%		
Bharatpur	21	2133	102	822	39	0.8	91%	83%	85%
Bhilwara	20	4516	225	1749	87	0.6	92%	91%	91%
Bikaner	17	2085	125	749	45	0.9	86%	74%	74%
Bundi	10	1723	179	720	75	0.9	91%	82%	82%
Chittaurgarh	18	2506	139	945	52	0.4	91%	91%	91%
Churu	19	2519	131	977	51	0.8	91%	87%	87%

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Performance of Districts (continued)

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RAJASTHAN (continued)									
Dausa	13	2168	165	927	70	0.5	92%	89%	89%
Dhaulpur	10	1479	150	478	49	0.5	89%	83%	83%
Dungarpur	11	2082	188	1198	108	0.3	85%	85%	87%
Ganganagar	18	2583	144	929	52	1.1	85%	55%	55%
Hanumangarh	15	2524	166	934	62	0.5	91%	80%	82%
Jaipur	53	9399	179	3293	63	0.9	90%	85%	85%
Jaisalmer	5	496	98	212	42	0.8	81%	89%	89%
Jalore	14	1704	118	659	45	0.8	87%	70%	70%
Jhalawar	12	1613	137	644	55	0.7	89%	89%	89%
Jhunjhunun	19	2817	147	1077	56	0.8	87%	80%	81%
Jodhpur	29	2953	103	907	31	1.4	91%	77%	77%
Karauli	12	2331	193	856	71	0.7	90%	94%	94%
Kota	16	2191	140	769	49	1.1	92%	84%	84%
Nagaur	28	3384	122	1166	42	0.9	94%	87%	87%
Pali	18	2492	137	1183	65	0.6	93%	87%	87%
Rajsamand	10	1871	190	753	76	0.7	86%	77%	77%
Sawai Madhopur	11	1929	173	706	63	0.5	93%	88%	88%
Sikar	23	2899	127	1112	49	0.8	93%	88%	88%
Sirohi	9	1306	154	550	65	0.8	87%	89%	89%
Tonk	12	2304	190	1065	88	0.5	97%	92%	93%
Udaipur	26	4923	187	2288	87	0.4	82%	78%	80%
TAMIL NADU									
Chennai	42	4544	108	1734	41	0.9	90%	82%	83%
Coimbatore	42	758		283		0.9	69%		
Cuddalore	23	3941	173	1372	60	0.9	93%	77%	85%
Dharmapuri	28	2387	84	848	30	1.0	79%	55%	62%
Dindigul	19	1561		592		1.1	92%		
Erode	26	2066		845		0.9	73%		
Kancheepuram	29	1381	48	372	13	1.8	80%		
Kanniyakumari	17	698		84		4.4			
Karur	9	36		14		1.0			
Madurai	26	63		13		3.5			
Nagapattinam	15	888		365		1.0	87%		
Namakkal	15	1804	121	590	39	1.2	91%	76%	76%
Perambalur	5	532		232		0.7	73%		

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Performance of Districts (continued)

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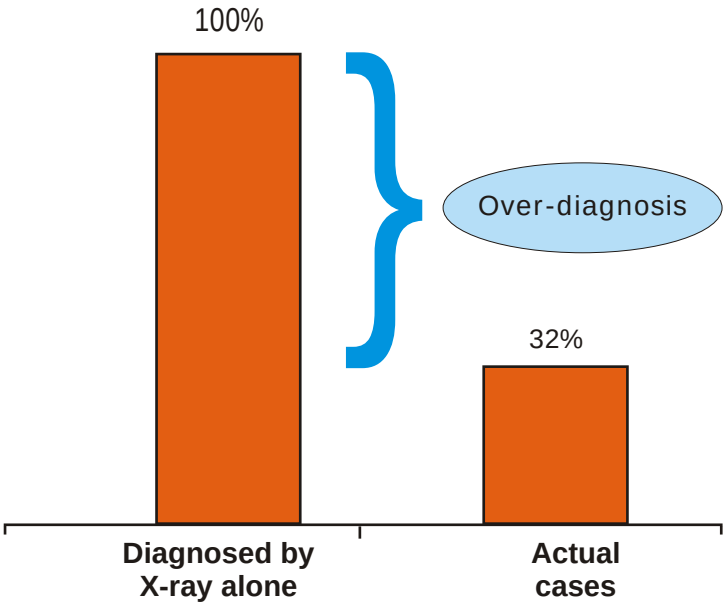
TAMIL NADU (continued)									
Pudukkottai	15	1231		483		0.9	85%		
Ramanathapuram	12	903		365		0.7	77%		
Salem	30	2750	92	1301	43	0.2	90%	90%	90%
Sivaganga	12	703		269		1.2	85%		
Thanjavur	22	2401	109	877	40	0.7	78%	59%	66%
Theni	11	127		38		1.8			
The Nilgiris	8	288		124		0.6	81%		
Thiruvallur	27	3825	140	1370	50	1.2	62%	77%	78%
Tiruchirappalli	24	2100	88	996	42	0.5	89%	77%	81%
Tirunelveli	28	1406		446		1.7	74%		
Tiruvanamalai	22	2025	93	857	39	1.0	79%		
Toothukudi	16	1148		498		0.8	85%		
Vellore	35	3417	98	1354	39	1.0	84%		
Viluppuram	29	2899	98	945	32	1.3	78%	100%	100%
Virudhunagar	18	664		161		2.4	77%		
UTTAR PRADESH									
Baghpat	12	1522	131	577	50	1.0	89%	80%	84%
Barabanki	27	3771	141	1576	59	0.8	89%	81%	81%
BCM Hospital Sitapur	0.5	310		56		1.3	83%	80%	80%
Gautam Budh Nagar	12	1740	146	613	51	0.9	85%	56%	58%
Ghaziabad	33	4495	137	1859	57	0.8	91%	76%	77%
Lucknow	37	4560	124	1931	52	0.6	93%	93%	93%
Meerut	30	5792	193	2706	90	0.6	96%	89%	90%
Rae Bareli	29	3145	109	1345	47	1.0	92%	87%	87%
Unnao	27	2722	101	1064	39	1.1	88%	79%	80%
WEST BENGAL									
Bankura	32	4648	146	2020	63	0.8	91%	87%	88%
Barddhaman	69	6764		2783		0.8	83%		
Birbhum	30	2246		1060		0.7	80%		
Haora	43	4209	98	1457	34	1.0	80%	72%	75%
Hugli	50	6899	137	2511	50	1.1	88%	85%	86%
Jalpaiguri	34	4741	139	2171	64	0.6	87%	81%	82%
Kolkata	46	4423	97	1724	38	0.6	88%	86%	86%
Maldah	33	4933	150	1497	45	1.7	83%	73%	78%
Murshidabad	59	6861	117	2473	42	1.3	91%	83%	88%
Nadia	46	4096	89	1535	33	1.1	84%	78%	80%
North 24 Parganas	89	5270		2010		0.7	79%		
South 24 Parganas	69	3051		1343		0.7	83%		
Grand Total	**4503**	**471658**	**121**	**185178**	**47**	**0.8**	**88%**	**82%**	**84%**

* Rate calculations include only districts implementing for all of 2001

X-ray-based evaluation causes over-diagnosis of TB



A systematic evaluation of well-functioning District TB Centres by the National Tuberculosis Institute, Bangalore found that nearly 70% of the cases diagnosed and put on treatment on the basis of X-ray did not actually have tuberculosis. These patients are subjected to unnecessary, expensive and potentially toxic medicines.

Indian Journal of Tuberculosis, 1974

At present, sputum smear microscopy is the best test for diagnosis of pulmonary tuberculosis.

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Tuberculosis Control: 3 Truths

- Every patient with cough for more than 3 weeks should have 3 sputum smears examined in a competent laboratory. No patient should start treatment for pulmonary TB without 3 sputum tests.
- All smear-positive patients should be effectively treated. Only observed treatment with proven regimens can ensure cure.
- The public system has a responsibility to monitor the diagnosis and treatment of every smear-positive (infectious) patient.