

India's Revised National Tuberculosis Control Programme (RNTCP): Budget and Performance

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Tuberculosis (TB) remains the leading cause of death in India, which bears nearly 20 per cent of the global burden. In 1992, a review of the TB control programme identified frequent shortages of drugs and inadequate staff and budget as some of the reasons for poor case detection and treatment completion rates. Since 1993, India has revised the programme with the assistance from the World Bank, the World Health Organisation (WHO) and bilateral donors. This article makes an attempt to review the relationship between the TB control experience and external aid for TB control over a period in India. Expenditures by the Revised National Tuberculosis Control Programme (RNTCP) had increased considerably from US\$ 36 million in 2002 to US\$ 67 million in 2008 and according to the WHO, in Global TB Control Report for 2008 there were no funding gaps reported for TB control since year 2002. More funding came from grants and a World Bank loan. By March 2006, 100 per cent of the population had been covered under RNTCP. Since the inception of RNTCP more than 8 million patients have been initiated on treatment with the treatment success rate of 86 per cent. This suggests that having a committed programme with good funding has helped in improving the performance of the TB control programme.

Keywords: Tuberculosis, DOTS, external aid, India

Introduction

Tuberculosis (TB) is an infectious disease caused by bacillus *mycobacterium tuberculosis* that spreads through the air when untreated TB patients cough. Left untreated, a single person with active TB can infect 10–15 others each year, creating a self-perpetuating pool of infection. It was estimated that one person in the world is infected with TB every second. Seven to eight million

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people become sick and two million die from it each year (WHO 2002a). TB remains the number-one killer infectious disease affecting adults in developing countries (Ministry of Health and Family Welfare 2005a). The 1990 World Health Organisation report on the Global Burden of Disease ranked TB as the seventh most morbidity causing disease in the world, and expected it to continue in the same position up to 2020 (Agrawal and Chauhan 2005a; Lopez and Murray 1990). The G-8 Summit, leaders of the world's wealthiest nations debated on urgent global agenda to fight against infectious and parasitic diseases, which 'threaten to reverse decades of development and to rob an entire generation of hope for a better future'. The G-8 Summit specifically agreed to work on ambitious targets to reduce the three 'diseases of poverty': AIDS, malaria and tuberculosis (WHO 2001). These three diseases serve to impoverish people and further marginalise the poor. Ministers of 20 high TB-burden countries, which carry 80 per cent of the disease burden, met in Amsterdam and made a commitment for providing full coverage with a TB control strategy in the near future (Broekmans et al. 2005). This large scale project funded by international agencies aims for a high cure rate. The screening process starts with microscopy, which is made available for every 100,000 population. Compared to many other developing countries where such services are not widely available, this rate is high.

TB in India

India unfortunately accounts for one-fifth of the global burden of TB. TB mortality in the country reduced from over 500,000 deaths per annum at the beginning of the programme to the current estimate of less than 370,000 deaths per annum (Dye et al. 1999; Ministry of Health and Family Welfare 2008). The annual rate of infection is around 1 to 2 per cent with a sharp increase in the rate of infection in the younger age group of less than 5 years of age. There has been no perceptible change in the epidemiology of tuberculosis since the national sample survey of 1956–57 (Rangan et al. 1997). The economic burden caused by TB in India is enormous (Rajeswari et al. 1999). There is no doubt that a sick workforce contributes to an unhealthy economy. Every year, TB costs more than US\$ 3 billion (Rs 13, 000 crores). In addition, every year TB patients spend more than Rs 645 crores (US\$ 180 million) on private TB care. TB does not merely reflect socio-economic

status, it perpetuates and exacerbates poverty. Poor labourers and farmers stay poor if they are sick. Improving health is a concrete and measurable way of reducing poverty and inequality both at the country and global levels.

Genesis of Revised National Tuberculosis Control Programme (RNTCP)

Despite the existence of the national tuberculosis control programme since 1962, no significant epidemiological impact was observed on disease prevalence (Tuberculosis Research Centre 2001). The emergence and spread of HIV and drug resistant TB threatens to further exacerbate the TB situation in the country. In 1992 the Government of India, together with WHO and the Swedish international development agency (SIDA), reviewed the national programme and the main reasons identified for the poor functioning of the programme were managerial weaknesses and inadequate funding (WHO 2000a). As a result, the programme was revised with help from various government sectors and donor agencies.

India recognised that the TB control initiative had to be implemented in tandem with poverty elimination programmes. In 1993 the revised programme based on the DOTS strategy was started on a pilot basis; this was scaled up in 1997. RNTCP focuses on integrating TB services into primary health services and other major health initiatives and on decentralisation to bring decision making and care closer to the patient. The entire country was covered by DOTS in March 2006. This article describes the evaluation, experience and results of the RNTCP programme and its role and effectiveness. In other words, it describes the constructive involvement of all donors' aid for TB control in India in terms of structural change of the programme, human resource development, population coverage, case detection, treatment success and quality maintenance.

Structural Change

The district tuberculosis centre (DTC) is supported by sub-district TB units (TUs) established for every 5,00,000 population to serve as a link between the district level and the periphery. TU is the lowest reporting unit under RNTCP. At the TUs, a special cadre of dedicated TB supervisory staff, senior treatment

supervisor (STS) and senior tuberculosis laboratory supervisor (STLS) are appointed on a contractual basis for carrying out supervisory work in the field under the charge of a medical officer-TB control. To further decentralise the diagnostic and treatment services, RNTCP designated microscopy centres (DMCs) have been established for every 1,00,000 population. Norms for the establishments of TUs and DMCs are relaxed to 2,50,000 and 50,000 population respectively in hilly/difficult and tribal areas. In addition, a vast network of DOT centres (treatment centres), all with trained DOT providers, have been established in all RNTCP areas so that patients can have easy access to TB treatment (Ministry of Health and Family Welfare 2005b).

Human Resource Development

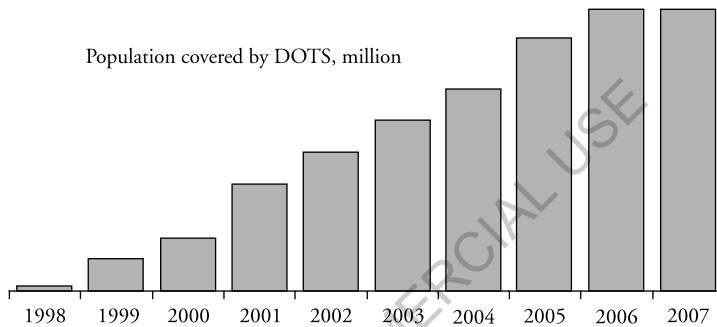
The RNTCP training modules were developed in 1997, and were revised in 2005. Since the start of the RNTCP implementation, the National Tuberculosis Institute, Bangalore, the Tuberculosis Research Centre (ICMR), Chennai and The Lala Ram Swarup (LRS) Institute of Tuberculosis and Respiratory Diseases, New Delhi, have conducted training programmes for medical officers, para-medical staffs (STS, STLS and LTs), TB health visitors and DOT providers. These institutes have trained trainers/facilitators, who have subsequently imparted training to other health providers in their respective regions. Sound technical and training policies have been formulated and nearly 4,50,000 health workers have been trained in RNTCP (Agrawal and Chauhan 2005b).

Population Coverage

There has been a more than a 50-fold expansion in RNTCP coverage since 1998 and by March 2006, India's DOTS programme had covered 100 per cent of the country's population. The expansion of RNTCP has been recognised as the fastest expansion of any DOTS programme in the world. Along with an increase in RNTCP population coverage, there has been a concomitant rise in the number of patients put on treatment. Over 100,000 patients are now initiated on DOTS treatment each month (more than in any other country in the world). In 1999, India's expansion of RNTCP accounted for one-third, and in 2000 and 2001 for over half, of the global increase in DOTS coverage. During 2004, over 1 million TB patients were initiated on treatment. From its inception till March 2005, the programme

had initiated more than 4.3 million patients on treatment, thus saving over 7,70,000 additional lives. In terms of treatment of patients, RNTCP is the largest DOTS programme in the world. In March 2006 the entire country was covered by RNTCP (Figure 1) (Ministry of Health and Family Welfare 2005c).

Figure 1
Expansion of DOTS in India



Source: Ministry of Health and Family Welfare 2008.

Case Detection

A nationwide network of RNTCP designated, quality-assured sputum smear microscopy laboratories has been set up, providing appropriate, available, affordable and accessible diagnostic services for TB suspects and cases. The cornerstone of RNTCP is the DOTS strategy. One crucial activity for DOTS is to ensure access to quality-assured TB sputum microscopy for case detection among persons presenting with, or found through screening to have symptoms of TB. This component of DOTS requires the presence of a network of quality laboratories in the country. More than 11,000 microscopy centres have been upgraded under RNTCP. A protocol for quality assurance of the sputum smear microscopy network has been prepared by RNTCP to maintain the quality of diagnostic services provided by RNTCP. It was pilot tested in five states in 2004, and is being implemented in the country.

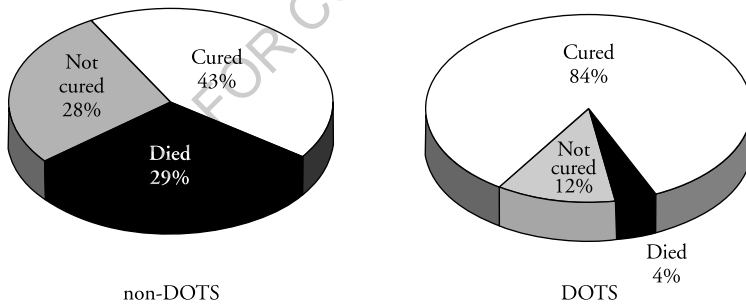
The case detection rate ranged from 44 per cent in the first quarter of 1999 to 78 per cent in the second quarter of 2004. In 2005, 56,85,220 suspects were examined (7,63,621 smear positive, 3,91,255 smear negative),

1,70,338 extra pulmonary cases and 1,64,377 re-treatment cases were started on treatment. The annual new smear positive case detection rates from 1999 to 2006 are 47 per cent, 47 per cent, 59 per cent, 69 per cent, 55 per cent, 72 per cent and 66 per cent. As a result of the rapid expansion in diagnosis facilities throughout the country, the proportion of sputum positive cases confirmed in the laboratories double compared to the previous programme and is on par with international standards.

Treatment Outcomes

Despite its rapid expansion, the overall performance of the programme remains good and in many areas it is excellent. The success rate among new smear positive ranged from 82 per cent to 87 per cent. The success rate among new smear positive patients from 1999 to 2005 was 82 per cent, 84 per cent, 85 per cent, 87 per cent, 87 per cent, 86 per cent and 86 per cent. Nearly eight out of 10 patients diagnosed in the programme since 1999 have been successfully treated. Treatment success rates doubled from 43 per cent in the earlier programme to 84 per cent in RNTCP (Figure 2).

Figure 2
DOTS Doubles Cure Rates



Quality Maintenance

The quality of the programme is maintained through regular supervision. Provincial and prefectural TB staff randomly visit patients in their homes to assess the quality of the programme. These visits include a careful review of the TB registry and the laboratory registry as well as treatment cards.

Microscopy quality is maintained through regular supervisory visits to each of the microscopy centres by the prefectural senior laboratory supervisor; all smear positive slides and 10 per cent of smear negative slides are reviewed.

The programme, a large-scale project funded by international agencies, aims at high cure rates. The screening process starts with microscopy, which is made available for every 100,000 population. Compared to many other developing countries where such services are not widely available, this rate is high. Management from the district to national level is conducted by specialised TB staff. Supervision of staff at the periphery is facilitated by a system of record keeping that is easy to understand but difficult to falsify; this includes separate TB registers, lab registers and treatment cards. Each dose of the drug regimen is observed by a DOT provider, diagnosis and treatment are provided free. Patients are encouraged to cooperate with the DOT strategy. Patient-wise boxes are provided to take drugs regularly and on time; these also ensure availability of uninterrupted drug supply to the patients initiated for the treatment (Agrawal and Chauhan 2005c, 2005d).

Expert Opinion

In India state governments are primarily responsible for health care, but their ability to design and implement effective health programmes is often limited by insufficient funding and a weak infrastructure. Overall health spending in India is estimated at 4.5 per cent of GDP, which is below the average of 5.6 per cent for low and middle income countries. The federal and state governments spend 1.3 per cent of the GDP on health. Public spending on health in India is 0.9 per cent of GDP, among the lowest in the world. Out-of-pocket private spending dominates, with 82 per cent of all health spending from private sources. Hospitalisation frequently results in financial catastrophe, especially without risk pooling. About 10 per cent of the Indians have some form of health insurance, mostly formal sector and government employees. The gap in public financing for health is widening between the rich and poor states, threatening to expand the gaps in outcomes.

India accounts for 20 per cent of all TB cases in the world (WHO 2000b). In addition there has been a global resurgence of TB over the last few decades and the HIV (Human Immuno-deficiency Virus) infection has contributed significantly towards this scenario. HIV infection is one of the strongest risk factors for the disease among those who have TB infection (HIV/TB)

(WHO 2001). Further, indiscriminate, irregular and inadequate chemotherapy among patients has given rise to an additional problem of multi-drug resistance (MDR TB). Resistance to the major drugs used for tuberculosis is a growing problem fuelled by ineffective treatment programmes, as they foster the emergence of drug resistant strains (WHO 2002b). Treatment of MDR TB is costwise exorbitant, toxic, arduous and often unsuccessful. HIV TB and MDR TB are twin threats to tuberculosis control and the re-emergence of TB in the developed nations and the spread of HIV will increase the burden on TB (WHO 1999). In many countries, including India, heightened political and funding support for the activities outlined in the first global plan to Stop TB (2000–05), with dedicated advocacy and communication activity to embed TB in the political agenda, has assisted progress against TB worldwide. Expression of support for TB control targets and for commensurate funding have been included in G-8 communiqués (2000 and 2005), the World Health Assembly Resolution (2005), the Commission for Macro Economics and Health (2001) and in high level statements by Nelson Mandela, the African Union, the Commission for Africa and Global Fund to Fight AIDS, Tuberculosis and Malaria. There has been substantial improvement in funding availability.

Since 2002 the total cost of TB control in the 22 High Burden Countries (HBCs) including India has increased each year. Overall, the funding for TB control has grown from US\$ 2.7 billion in 2006 to US\$ 4.1 billion in 2010. The largest share of funding is from national governments (86 per cent), followed by the Global Fund (US\$ 350 million, or 9 per cent of total funding) and then by grants from donors besides the Global Fund (US\$ 112 million, or 3 per cent). Funding to support TB control in the 22 HBCs has increased by almost US\$ 500 million since 2002, reaching US\$ 1.4 billion in 2006. Governments of the wealthier HBCs (notably Brazil, China, the Russian Federation and South Africa) provide most of the funding needed for TB control in their countries; the other countries rely more on grants from donors, including the Global Fund to Fight AIDS, tuberculosis and malaria. Funds provided to India were 36, 42, 44, 47 and 57 million US\$ between 2002 and 2006. There is no funding gap observed in this period. The funding gap reported by the 22 HBCs for 2006 was US\$ 141 million; it was US\$ 180 million in total for the 74 countries that reported data. NTP budgets for 2006 are broadly in line with the Global Plan to Stop TB,

2006–15, except for TB/HIV control where NTP budgets are much lower (WHO 2002c, 2003, 2006).

Conclusion

Effective scaling up of the TB control programme was possible because of an extraordinary global effort involving international agencies, government donor organisations, national and local governments, health professionals and development workers. At the country level, it was based on government stewardship of resources, linked to community participation in all aspects of planning and management of activities. At the local implementation levels the funds are channeled to the districts through TB control societies as a way of accelerating action by overcoming traditional institutional and bureaucratic obstacles. The partnership between the Indian government, the World Bank, WHO, and bilateral donors demonstrates how adequate resources can be effectively mobilised to address TB control as a public good. Overall, this analysis suggests that substantial progress in tuberculosis control was achieved with increased investment from government and donors (WHO 2008). This analysis clearly shows that having a committed programme with good funding has helped in improving the TB control programme in India.

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