The Mumbai experience in building field level partnerships for DOTS implementation


**Summary** In February 1999, the Revised National Tuberculosis (TB) Control Programme (RNTCP) was implemented in the city of Mumbai after a pilot phase of 5 years. The city has a population of more than 12 million people and an estimated annual TB incidence of 21,000 cases, 8000 of these being infectious. This paper describes a partnership between the TB programme and a Non Governmental Organization (NGO), which began with a methodological analysis of the problems faced by the programme to help identify other key organizations, who might usefully be involved. The work focussed on 'networking' to ensure the optimum use of existing resources. The problems encountered affected all levels of TB control from access to drug supply and treatment. The major issues related to an inadequate public health infrastructure resulting in poor technical and administrative support to field staff. There was confusion over roles of the health personnel in the TB programme and the public health facility, as well as poor technical performance. Partnerships were found to be useful in addressing the following areas: (1) the implementation of an external quality assurance scheme for sputum microscopy through involvement of microbiologists from large hospitals and research organizations; (2) training and capacity strengthening of programme and public health facility staff through innovative training and team building exercises organized by the programme, NGOs and the private sector; (3) development of Information, Education and Communication (IEC) material through partnerships with NGOs, and (4) the involvement of local NGOs and private doctors to increase case finding and to improve access to direct observation of treatment (DOT). The paper discusses the lessons learnt in this process and identifies some of the key issues in urban TB control, for consideration by policy makers.

**Introduction**

National Tuberculosis (TB) Programmes (NTP) have historically been designed for the numerically predominant rural populace. Urban areas have, invariably, been presumed to have less urgent health needs and similar secular curves to rural areas, while framing policies. It has been shown, however, that migration and intermingling between various classes leads to a complicated epidemic curve in urban areas.

Apart from the epidemiological complexities, there are several other issues, which make TB control in urban areas more difficult, and demand for a different approach. One of these relates to the health systems in urban areas, which do not
develop hand in hand with urban development, and hence do not follow any set population or physical access norms. When the Directly Observed Treatment, Short course (DOTS) programme, based on population norms is superimposed on such a delivery system, it results in operational problems, affecting access to TB care.5,6

The other major problem in urban areas is the presence of a wide variety of providers of health and TB care—in the public as well as private (in several developing countries, these are large and unregulated) sectors—which poses barriers to standardization of TB care.7,8 The presence of these varied types of providers, on the other hand, provides an opportunity to use them innovatively to help the programme and to ultimately benefit patients.

Using the example of the DOTS programme in a large urban agglomerate, this paper will illustrate the steps taken by the programme in partnership with an international humanitarian organization, Medecins Sans Frontieres (MSF), Luxembourg, to identify the problems posing barriers to TB control efforts and the innovative solutions sought through the building of partnerships at the field level with other non-governmental and private providers. The need for a different approach to TB control in urban areas and a better understanding of the issues related to partnerships, are the two broad themes of the paper.

The case study of Mumbai

Mumbai is a metropolis in the Western Indian state of Maharashtra. It is a 437 sq. km long island city with a population of 12 million. More than 49% of its population lives in slums and slum-like conditions.9 The city is estimated to have more than 16,000 incident cases and 9000 deaths due to TB every year.10

Mumbai has a huge network of public health infrastructure consisting of four medical colleges and tertiary care hospitals, 21 secondary care and special hospitals (including the 1000-bedded TB hospital), 26 maternity homes, 163 municipal dispensaries and 176 urban health posts providing outreach services run by the local government (see footnote dagger). Apart from this, a host of state and central government health services are also present (defences, railways etc.). The private sector is massive, with 50 large hospitals and 2000 small nursing homes and hospitals and approximately 8000–10,000 private practitioners,1 and as in other parts of India, totally unregulated.9

A city TB programme under the NTP was implemented in 1972 through the public health department with the TB hospital providing the technical and monitoring role. In 1993, a municipal ward in Mumbai (500,000 population) was chosen as one of the sites to implement the Revised National TB Control Programme (RNTCP), based on the DOTS strategy.10 The pilot programme was later extended to cover two more wards (total population of 1.5 million) in 1995. In 1999, the RNTCP covered the entire city under the expansion phase.

In July 1999, the municipal corporation signed a Memorandum of Understanding with Medecins Sans Frontieres, an international humanitarian organization, which had experience working with the DOTS programme in other countries. The partnership had the following objectives:

- To help implement a pilot project in one of the six zones of the city covering a population of 1.2 million.
- To create a network of all providers in the zone to help implement the DOTS strategy.
- To provide technical consultancy to the programme in areas like information, education and communication (IEC), training and quality assurance.

This partnership was instrumental in identifying several problems and weaknesses in the programme and in identifying appropriate solutions to tackle several of these. It also helped to identify more partners at the field level to collaborate with the programme.

Problems encountered

The programme, due to pressures from the centre to reach the high sputum conversion and cure rates as demanded by the RNTCP guidelines, tended to use several methods of case selection right from its inception. Table 1 shows that between 15% and 53% of sputum-positive patients were not registered under DOTS in Quarter-1 2001 (these data were not available for earlier quarters). The complex population characteristics and dynamics in different parts of the city demanded a range of different approaches, with which the programme managers were unable to cope. This resulted in the denial of

---

9Census 2001 figures as reported by the Times News Network in the Times of India, May 11, 2002.
10Health Profile 2000. Brihanmumbai Mahanagarpalika, Public Health Department.
1Directory of health services in Mumbai, Mumbai Municipal Corporation, 1994, updated with information compiled by outreach health workers.
TB care under the RNTCP to a large number of vulnerable people like the homeless, migrants and alcoholics. HIV-positive individuals were also being denied registration under the programme, for fear that they would contribute to lower cure rates because of the higher mortality rate associated with HIV (see footnote sect). Reports of this kind of case selection to maintain the high cure rates, are available from other parts of the country, as well.11,12

Detailed analysis of performance by zone and ward showed that some areas, like those with large slum populations, were reaching the case detection norms very easily in the programme. In contrast, other areas, which were more commercial and had a lower slum population, lagged behind in case finding when the programme was first initiated (Table 1).

One of the key problems identified as posing a barrier to the success of the programme was its integration into the existing general health services, without due consideration being given to the infrastructure and staff-related problems. Young inexperienced contractual staff was appointed as TB supervisors by the programme; these supervisors lacked technical support from their supervisors—the Medical Officers for TB Control and the District Tuberculosis Officer (DTO)—who were designated officers, but not available full time for TB control. The existing vertical TB staff was not optimally used; the staff in the general health facilities lacked ownership for the programme and used the confusion related to roles and responsibilities of different health workers in the programme as an excuse for not integrating themselves with the programme. These problems, combined with the need to achieve and maintain high cure rates, made the programme ‘patient unfriendly’.

Yet another problem created by the top down approach of the programme, was related to sputum microscopy. While the earlier NTP offered sputum microscopy through a limited number of laboratories in TB clinics and secondary and tertiary hospitals, the RNTCP guidelines suggested decentralization of sputum microscopy (one laboratory per 100,000 population) as a means to improve access to TB diagnosis. These norms, were construed as policy by the programme managers and in one sweep, the number of laboratories

---

Table 1 Performance of RNTCP in Mumbai

<table>
<thead>
<tr>
<th>Zone</th>
<th>Annualized new sputum smear positive case detection (50/100,000)</th>
<th>Annualized total case detection (135/100,000)</th>
<th>Sputum smear positive patients registered under DOTS (%) (&gt;90%)</th>
<th>Sputum smear conversion (90%)</th>
<th>Cure rate (85%)</th>
<th>Defaulters rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone 1</td>
<td>20</td>
<td>32</td>
<td>59</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Zone 2</td>
<td>54</td>
<td>49</td>
<td>62</td>
<td>54</td>
<td>54</td>
<td>54</td>
</tr>
<tr>
<td>Zone 3</td>
<td>45</td>
<td>49</td>
<td>62</td>
<td>45</td>
<td>45</td>
<td>45</td>
</tr>
<tr>
<td>Zone 4</td>
<td>29</td>
<td>36</td>
<td>50</td>
<td>29</td>
<td>29</td>
<td>29</td>
</tr>
<tr>
<td>Zone 5</td>
<td>37</td>
<td>54</td>
<td>57</td>
<td>37</td>
<td>37</td>
<td>37</td>
</tr>
<tr>
<td>Zone 6</td>
<td>31</td>
<td>46</td>
<td>57</td>
<td>31</td>
<td>31</td>
<td>31</td>
</tr>
<tr>
<td>Mumbai</td>
<td>37</td>
<td>44</td>
<td>54</td>
<td>37</td>
<td>37</td>
<td>37</td>
</tr>
<tr>
<td>Source: Quarterly reports of RNTCP in Mumbai, prepared by the Mumbai District TB Control Society. Figures within parentheses indicate the targets set by the WHO (75% case detection for an incidence of 50/100,000).</td>
<td>Quarter 1 2001 for case detection, Quarter 4 2001 for sputum smear conversion and Quarter 1 2001 for cure rate and defaulter rate. Zone 1 has three medical college hospitals and one large hospital and zone 2 has two medical college hospitals.</td>
<td>Figures within parentheses indicate the targets set by the WHO (75% case detection for an incidence of 50/100,000).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
offering sputum microscopy was increased to 90. The decision to include all labs performing routine investigations like blood, urine and peripheral smears for malaria, was taken without proper planning and attention to infrastructure, manpower and supervision requirements. This resulted in a range of structural problems, posing barriers in access to sputum microscopy, delays in diagnosis and starting of treatment, and raised several issues related to bio-safety.

Since population norms formed the basis of the policy to increase microscopy centres, this resulted in some congested parts of the city having laboratories practically next door to each other, while in distant suburbs where distances were large, access to sputum microscopy remained a problem. The problems related to monitoring and quality control of this large number of laboratories had not been envisaged, resulting in a poor quality control programme (see footnote **).

The other major problem was the lack of standardization of TB diagnosis and treatment within the various segments of the public health facilities. The entire existing range of providers in the public health sector, affiliated to the local, state and central governments like medical colleges, secondary and tertiary care hospitals, clinics and dispensaries, continued to provide TB services including unsupervised Short Course Chemotherapy (SCC), diluting the efforts of the RNTCP, because of a lack of a clear policy at the various levels. This also proved a deterrent to the expansion of the DOTS strategy, since several patients, preferring the ease of fortnightly collection of drugs to thrice weekly Directly Observed Treatment (DOT), consciously chose non-DOT health providers, who also offered them free TB treatment under the old unsupervised SCC based NTP.

Apart from this range of public providers, the huge unregulated private sector consisting of family physicians, consulting specialists, small and large hospitals, was catering to the TB patients, and not conforming to national or international guidelines for diagnosis and treatment of TB. A few Non Governmental Organizations (NGO), were also providing free or subsidized TB treatment, again unaware of the national TB control efforts and the guidelines. The programme managers, unfortunately, lacked the capacity to regulate or rope these providers into the programme so as to standardize TB care in the city.

DOT was limited to the confines of the health centres, thereby restricting its access. In a busy commercial centre, where the poor have no time to spare from their busy livelihood, clinic-based DOT, thus, proved to be a deterrent, resulting in high incidence of initial defaulting, treatment interruptions and defaulting (Table 1).

The lack of a focused ‘Information, Education and Communication’ (IEC) strategy for patient and community information and education was also seen to be a deterrent to improving utilization of the TB services by the community.

**Interventions**

The interventions were in the form of a series of field-level partnerships with public health providers, private practitioners and NGOs in a range of interventions, to help the programme and the patients.

The most important intervention, which was seen as key to help improve both case detection and treatment adherence, was to improve the quality of the patient–provider interaction. Since this aspect had not received proper attention in the RNTCP training modules, this was the first intervention, which was taken up jointly by the programme managers and the partner NGO. A training module covering sensitization to patient needs, team building exercises, defining roles and responsibilities, improving communication skills and introduction to counselling, was designed and training of all key programme staff—both supervisory and field level—was undertaken with the help of another NGO involved in training, using innovative participatory methods.

Simultaneously, IEC material for patient education was jointly conceived, produced and pilot tested by the programme and the partner NGO, with professional help. The partner NGO was encouraged to initiate publication of a quarterly newsletter for the pilot zone. This newsletter was used as a medium to gain support for the RNTCP.

---

**DOTS Directory prepared by the Mumbai District TB Control Society for the city of Mumbai.**

**Background paper prepared by MSF for the meeting “RNTCP: Technical and Operational Aspects of TB Bacteriology” held at BYL Nair Hospital and TN Medical College, Mumbai, 11–13 June 2001.**

**Data compiled by MSF social workers show this to be an important reason among patients not registered under the DOTS programme.**

**Reports of MSF social workers based on interviews and meetings with patients and community members show limited use of the RNTCP due to a lack of knowledge about the availability of free TB services under the programme.**

**A module on “Improving interpersonal communication skills in the RNTCP: Key concepts and role plays” was published by the Central TB Division, Directorate General of Health Services, Ministry of Health and Family Welfare, New Delhi, in 2002.**
from the general health services and other NGOs, by sharing information.

The need to increase access to the DOTS strategy, led to the involvement of private doctors and NGOs and the decentralization of DOT. NGOs working in health and TB were roped in to support TB patients by arranging DOT providers, providing nutritional and financial support, making home visits and counselling patients and their families, as well as providing information and education to the community.18

The issue of improving the quality of sputum microscopy was tackled by using available expertise from medical colleges, tertiary care hospitals and research organizations. An External Quality Assurance Scheme (EQAS) for the city was conceived in collaboration with the Tuberculosis Research Centre (TRC), Chennai and the microbiologists from the centres of excellence in the city, and implemented with the help of the programme managers.

Other public health providers like the medical colleges, large hospitals run by the state and central governments, the railways, defence services and the insurance sector have been approached and attempts to rope them into the programme are being made, thereby moving towards standardization of TB care in the public sector.

The first attempt at involving private medical practitioners in the RNTCP was made through a local medical association, which had been collaborating with the NTP and running a TB programme for close to 10 years. Through the facilitation of the partner NGO, the operational and logistical details of a collaborative programme between the RNTCP and the association were determined, including the accreditation of a private laboratory. Simultaneously, the field workers and supervisors in the programme, recognizing the usefulness of private doctors as DOT providers, started involving them in the programme, through personal contacts. But this was neither documented nor reported by the programme, and remained area and worker-specific. The experience gained through these initiatives was instrumental in realizing the need for a larger experiment to study the feasibility and impact of a public–private mix initiative in an urban setting. Increase in case detection, sputum conversion and cure rates and a decrease in defaulter rate—in the intervention zone (Table 1).

Apart from quantitative improvements, there have been some qualitative changes in the programme as well. Mumbai has managed to forge partnerships in areas beyond those mandated by the government NGO guidelines. NGOs working in health and TB, particularly grass roots NGOs, have been roped into a NGO forum and sensitized regarding the technical and operational aspects of the programme. This forum is used by NGOs as a platform to discuss their field-level problems and suggest practical solutions, which are then communicated to the programme managers. The support provided by NGOs to the patients and the programme has helped bridge the gap between them. This has, consequently, led to the programme seeking their collaboration wherever appropriate, as in the case of the EQAS, where a research NGO was selected as one of the quality assurance centres for the city.

The responsibility for publishing the newsletter, started in the pilot zone, has now been undertaken by the programme for the entire city, with minimal editorial support from the NGO.19 The efforts in developing a flip chart for patient and family education has dovetailed into the WHO’s efforts in India to produce a generic set of patient aid kit for the entire country.***

The four-tiered EQAS, involving medical colleges, large hospitals and a research organization has shown that the first level of quality control recommended by the programme is neither functional nor effective.11 This scheme, however, is helping in capacity building of laboratory technicians and supervisors and improving the quality of sputum microscopy in the programme. This process has also helped build bridges between medical colleges, large hospitals and the programme, and initiated the implementation of the programme in these institutions, with extra manpower offered by the programme. This has resulted in an 82% increase in new smear-positive case detection and an 123% increase in total case detection in the intervention zone between Quarter 2, 2001 and

Results

These interventions have resulted in a significant improvement in the programme outcomes—an

18A total of 26 NGOs are now collaborating with the RNTCP in Mumbai.

19Vishwas, the quarterly newsletter is being published since October 2000. Since December 2001, the publication has been taken over by the Mumbai District TB Control Society.


14Quarterly report of the EQAS for Mumbai city for the first quarter of 2002, compiled jointly by the Mumbai District TB Control Society, the quality assurance centres and MSF.
Quarter 1, 2002, which was the period when the medical colleges started implementing the programme.\textsuperscript{16,17} Training and sensitization of health workers, has led to an improvement in the quality of patient-provider interactions. Regular patient meetings are now organized at the various health centres, where patients are encouraged to discuss their problems and share their experiences with other patients.

Access to DOTs and DOT has increased through the involvement of NGOs and private practitioners as DOT providers, the creation of a supportive environment for patients, the decentralization of DOT and the strengthening of IEC activities.

The experience of public–private mix gained through partnership with a local medical association, led to the development of a proposal for an operational research project in two zones of the city covering a total population of approximately 3 million. The project, which secured external funding, and is now being implemented with the help of NGOs, aims to identify the most feasible approach for public–private mix for TB control in the urban context.

The methodical process of identifying problems and suitable solutions has resulted in the realization of the need for operational research in the programme context. This has resulted in the forging of new field-level partnerships with NGOs and academic institutions to undertake operational research in several areas like:

- Implementation of the public–private mix for TB control.
- Understanding delays in help seeking, diagnosis and treatment.
- Developing the technical and operational guidelines for the EQAS.
- Studying the prevalence of multi-drug resistant strains in the programme context and their virulence and transmission patterns.

Discussion

The theme of partnerships is currently strong within international health, along with the concept of the public–private mix, but the creation and development of partnerships is difficult and challenging.\textsuperscript{16,17} Guidelines are available to assist the process, e.g., Swiss Commission 1998,\textsuperscript{18} but ultimately each partnership is unique and has its own process and agenda.\textsuperscript{19} As this paper has demonstrated, through the development and working of this particular partnership between MSF and the RNTCP, new relationships were forged, broader networks were created, and an effective dialogue with government led to new ideas and plans to support TB control activities in Mumbai.

This experience of implementing the RNTCP in Mumbai through partnerships has helped to identify and raise two important issues. The first relates to the context of urban tuberculosis. A key area within this context relates to the case finding norms set by the programme, which are guided by the prevalence and incidence rates averaged for the country. Epidemiologists and researchers have made a case for revision of these rates in order to help rational allocation of resources and evaluate the efficiency of programme delivery.\textsuperscript{20} Nowhere is this needed more than in the urban context, where a large proportion of people live in slums and slum-like conditions with poor access to sanitation and health care. Mumbai provides clear evidence for this need, where some parts of the city with a large slum population had over achieved the norms for case finding even before the programme got over its early ‘teething problems’. This, instead of sounding alarm bells for the programme managers to look deeper into the reasons for the differences, led to complacency at having achieved the “targets” set by the programme.

The other area in urban TB control, which needs a clear policy is the optimal use of all available resources. In stark contrast to the rural context, urban areas have a higher density of public and private health providers (including NGOs). Neglecting to assess their quality and availability for collaborations with the programme, during the planning process, may in fact, delay the expansion of the DOTS strategy, as seen from the Mumbai experience. If this had been a clear mandate for the programme manager, the programme would have needed much lower investment to create the infrastructure for diagnosis of TB and delivery of DOT in the city.

Seeking help from other providers from the beginning would have helped programme managers to truly understand the meaning of partnerships. This is the second broad learning from the Mumbai experience. What has been achieved through local field level partnerships has not been truly need-based. Had it not been for the continuing efforts of the partner NGO, the programme, having reached its required targets, would have failed to realize the need for several of the interventions involving other providers, which were neither mandated nor recommended. Moreover, the sustainability of some of these partnerships would also be debatable since these are not need-based. Hence, it should be
realized by policy makers that the initial thrust on setting up a programme capable of delivering the targets, could be a barrier to initiating later collaborations. This could hold true for the public–private mix efforts, which are receiving a focus from TB programmes, especially in developing countries with a huge private sector.21

One prerequisite for initiating partnerships is empowering programme managers to make local flexibilities. This requires global and national policy makers to ensure that programme managers understand the difference between guidelines and policy, so that they are encouraged to identify locally relevant interventions. Nowhere is this more evident than in the involvement of NGOs in the RNTCP. A set of guidelines published by the Ministry of Health in India, limits NGO involvement to five broad schemes.22 These guidelines, in fact, proved to be a deterrent to NGO involvement in Mumbai in the initial phases, since it was difficult for NGOs to fit themselves into these predefined schemes, as mandated by the programme. Moreover, the scope set out by these five schemes limited the programme’s thinking and thereby failed to visualize the range of interventions in which NGOs could collaborate with the programme—for instance, by developing IEC material, training, developing, participating in and coordinating a Quality Assurance Scheme, facilitating collaborations with other providers and undertaking operational research.

With the increase in the interactions between the public and private sectors, it is realized that there might need to be a separate component of the programme with earmarked resources. The focus of such a component should be on building the capacity of the staff to understand the need and usefulness of partnerships, to identify appropriate partners, to initiate the process of communication with potential partners and sustain these partnerships.

The lesson learnt from both the setting up of an EQAS and the involvement of other providers, has been the need to focus on “quality of care”. Since the programme is designed with the rural context in mind, use of limited resources is the focus. However, with the availability of a wide range of providers in the public and the private sectors, the quality of all aspects of the programme from staff training to patient care, consciously needs to be raised and indicators developed for its measurement. This would also help the programme to remain an equal partner and sustain the collaboration while working with other providers.

Since information and communication are an integral part of urban living, the availability of a clear and contemporary IEC and advocacy strategy is crucial, to address all sections of society from the community to politicians, to voluntary health providers and to the private and the corporate sectors, which support health initiatives in urban areas.

Ultimately, it is through the creation of ‘healthy’ partnerships that relationships can be developed between the RNTCP and other organizations to assist in the process of creating an urban health care structure that adequately supports the needs of people with tuberculosis.

Acknowledgements

The authors express their gratitude to Dr. Himanshu Gupte, Programe Assistant, MSF for help with data compilation and to the social workers at MSF, who have been responsible for collecting and collating information from patients and the community.

References

5. Chakraborty AK, Krishnamurthy MS, Shashidhara AN, Juvekar S. Missed opportunities for diagnosis of pulmonary tuberculosis among rural patients seeking relief on their own under the tuberculosis programme in India. Ind J Tub 2001;48:181–92.

12. Departments for International Development, UK. Operations research to assess the needs, perspectives of TB patients and providers of tuberculosis case in Nehru Nagar and Moti Nagar chest clinic areas of Delhi. LRS Institute of Tuberculosis and Allied Diseases. DFID Report, New Delhi, 1998.


