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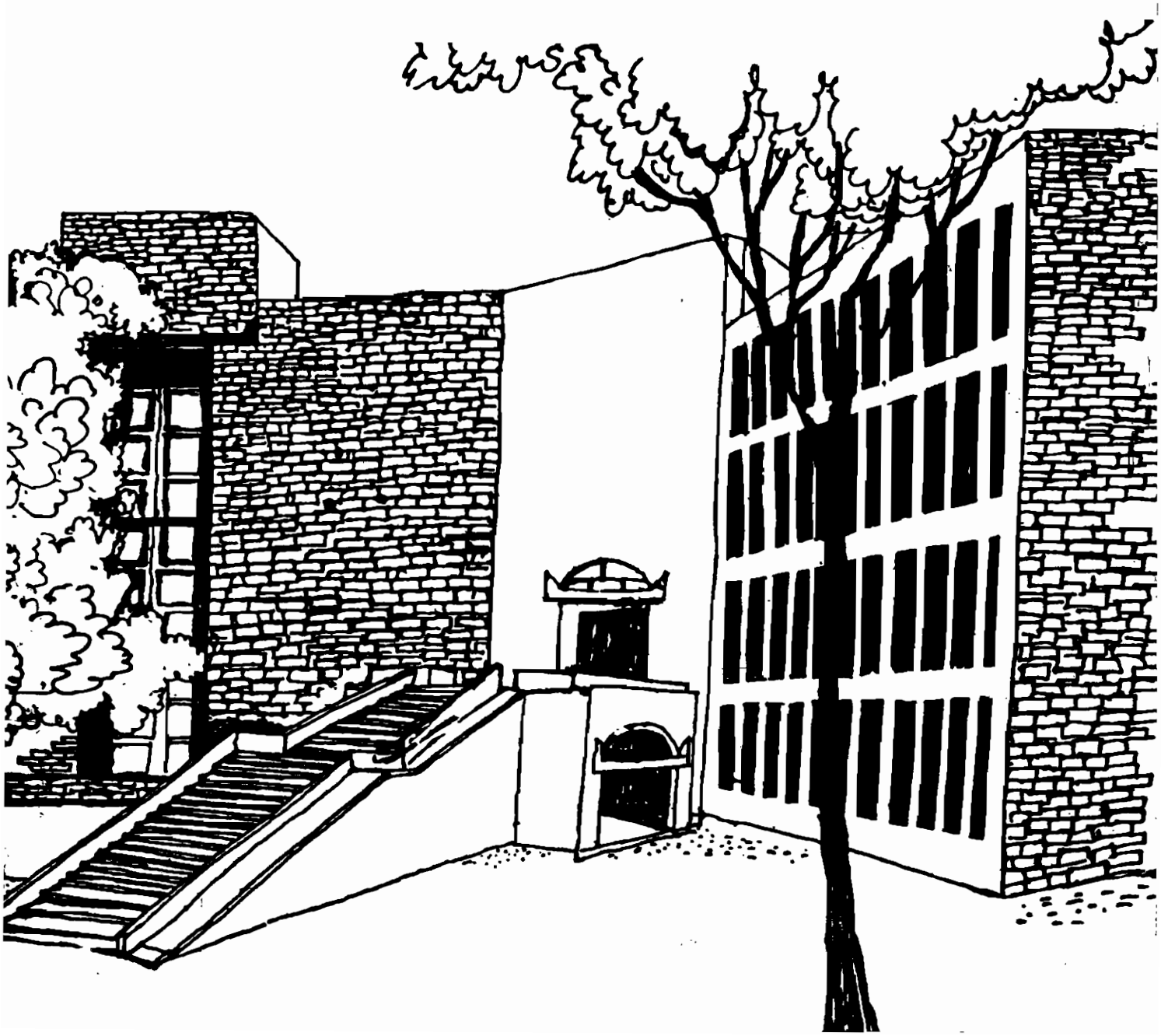

Tuberculosis Control in Developing Countries: A Generalized Community Health Worker Based Model

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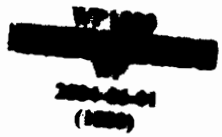

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Content

Tuberculosis control in developing countries: A Generalized Community Health Worker Based Model

"TB is definitely a burden for the poor. TB is a significant burden for women and children in Bangladesh. TB involves the family first and the society later. Adequate National Tuberculosis Program services should be seen as a human right and promoted in the local level planning."

Source: National TB Control Program of Bangladesh, Review and Strategic Plan 2001-2005, 9 August 2001

Abstract

Tuberculosis is a known major health care burden in developing countries. The burden is on account of huge budget allocation necessary to this sector. World Health Organization (WHO) has been assisting individual governments to control this curable disease. The Amsterdam declaration aims to control tuberculosis by the year 2005. The TB control project implementation experiences are varied across countries both on cure and detection rates. The government initiatives are complemented by the non government organizations involvement at the operational level and supported by international health experts at the conceptual level. The BRAC model involves the NGOs in an extensive and cohesive way.

This paper documents the BRAC model for TB control. We introduce the concept of value chain, in the context of TB control. Based on the concept of value chain, the logic for the effectiveness of the BRAC model is discussed. An improved version of the Bangladesh service delivery model is proposed. We hope the model proposed in this work would draw the attention of policy planners, and help them to control TB in their respective countries.

Context, need and motivation

TB affects all sections of the society, but the poor are more vulnerable. TB cripples the poor by restricting their opportunity to earn. It destroys them socially. If not properly diagnosed and cured (or full treatment is not completed), TB even causes death, which could have been avoided. Women and children who are vulnerable to this curable disease, receive unequal attention in detection, cure and prevention activities.

As per the WHO annual report 2003, TB is a major health care burden specifically in developing countries both in Asian and African continents (Appendix 8 and 9). WHO has evolved an effective procedure and a treatment mechanism by which this disease can be completely cured (Appendix 2).

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The budget for the TBC program is a part of the respective national health program budgets. These budgets are supported by international funding agencies. A significant portion of the budget is also generated by the internal resources in the country.

TB project implementation is supported by national health care administration and external consultants drawn from a variety of international organizations. A large number of studies have been reported on clinical research, project implementation experience and on every possible aspect related to detection, cure and prevention of this disease.

Over a period of time developing countries have established an extensive health care infrastructure in terms of health care facilities (both primary and secondary), network of pathological laboratories, and adequately trained technical manpower. TB control programs are channeled through this state owned infrastructure. Every country has a mix of alternative service delivery models like public health services network, private health service providers, non-governmental organizations and the community based organizations, etc. The degree of emphasis, importance and effectiveness of the delivery modes are context dependent. Surveillance procedure to detect cases by demographic studies is a standard practice in every country.

Drug availability is recognized as an important element to the successful implementation of the TB control program. Accordingly, every government has made significant attempts to ensure easy and continuous availability of drugs to needy patients at subsidized rates.

In spite of all these efforts, the communities in developing countries suffer. In several countries, chances of TB control in the near future are poor. Often, it is feared that TB could reappear in multi drug resistance form. It may also accelerate the incidents of HIV positive cases. Several people are being infected and affected in poor countries. Significant portion of TB infected individuals die due to non-availability or access to treatment. Therefore, the central question is 'what can be done' to expedite the process of cure to the infected patients? What are the managerial challenges that need to be addressed in TBC programs?

In this paper, we document the BRAC model in TBC. Based on this study, inferences are drawn as to why this model is so successful in detection and cure rate. Based on this experience, we evolve a generic model, which may enhance the effectiveness of TB implementation projects.

This paper is organized into four major themes. The first theme is the implementation details of TBC program in the context of Bangladesh. Under this theme, information related to the challenges in TBC in the context of Bangladesh, the National Health Policy of Bangladesh, the role of BRAC*, the specific implementation details of the model are included. The results of this intervention in terms of cost, recovery and detection are summarized.

* An NGO which is responsible for facilitating TBC program in Bangladesh

The second theme is the implementation experiences in the context of countries like India and other developing countries.

The concept of value chain in the context of TB control is the third theme discussed in this paper. This is complemented by a discussion on why the BRAC model is successful.

The fourth theme is to discuss how the BRAC model can be replicated in other contexts. Under this, a critical analysis of the limitations of the Indian and BRAC delivery models is presented. A modified version of the BRAC model is proposed in this work. In our opinion this model holds tremendous potential to control TB.

TB Control Program Implementation

TB control program implementation is primary responsibility of the national government. WHO plays an important role in advising nations on program implementation. It provides comprehensive support on the managerial expertise required in implementing the program, technological and technical support necessary in the context, and capacity building. WHO shares experiences and learnings from various countries in implementing TB control project.

WHO has standardized TB treatment and this is known as DOTS strategy (for implementation results of DOTS strategy see Appendix 2). This strategy is based on a set of drugs and their dosages. It also evaluates patients before and after the treatment. TB control programs are prevalent in those countries where there is no comprehensive medical insurance policy. As a consequence, extensive government support is a necessary requirement for program implementation.

TBC programs' budget includes the cost medical supplies necessary for case detection and medicines necessary for treatment. The budget required for the TB program is often consolidated as part of the essential health care package aimed at the poorest of the population and the needy patients who may not be able to find resources to support their treatment.

The poorest of the poor in any country are the most affected people by TB and they are the ones who are irregular on the treatment. They do not even know whether they suffer of TB and if so, where to get treated. They fail to show up in detection camps until they are seriously ill. They are the ones who are very challenged by this disease.

There is no fee for the services and medical supplies given to TB patients. Procurement of drug supply and the clinical equipment are managed by the program agency or by the corresponding representative of the local government.

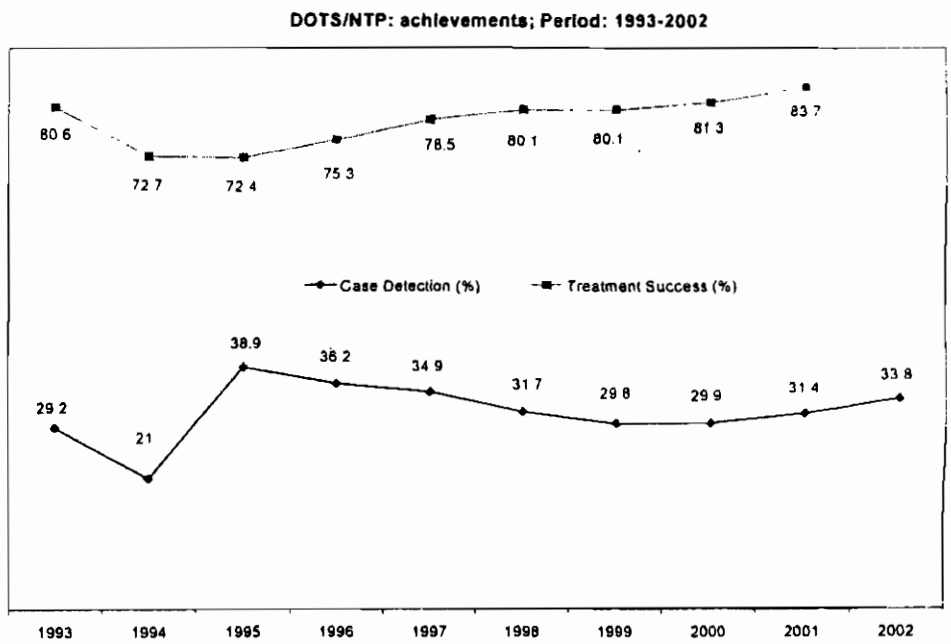
Extensive treatment tracking mechanisms, surveillance are part of the program implementation. Therefore the implementing agency stresses a lot on data collection, reporting, and routine data analysis to evaluate the impact of the program vis-à-vis the

intended purpose. There is also a monitoring on the budget spent as part of the MIS reporting system.

Bangladesh and its challenges

Bangladesh had a population of 130 million people in 2003. Nearly half of its population is infected with some kind of TB. Every year, roughly three million people develop an active TB.

Bangladesh, with the help of WHO, has established a national TB program. Over a period of time, it has established excellent infrastructure facilities like network of laboratories (Appendix 1), capacity building and health care facilities. The health care facilities are spread in all urban and rural areas at the Taluka and Upazilla levels. By an active involvement of community participation, detection has increased to roughly 100,000 cases per year. Cure rate in Bangladesh is 84 percent, which matches with the international standards. However, the percentage of detection is 34 percent, which is very low according to international targets (See Figure 1).



Source: *National Tuberculosis Control Program-Bangladesh, Activity Report: 2002, pp.18.*

The national TB program in Bangladesh is integrated with HPSP (Health and Population Sector Programs) which is an integral part of an Essential Services Packages (ESP). The national TB program requires a budget of approximately US $ 25 million per year in Bangladesh. Bangladesh has adopted the WHO recommended DOTS strategy (for related information see Appendix 4).

TB care in Bangladesh is delivered through a whole set of delivery channels.

- Government owned health care clinics with or without the support of community health workers.
- Purely community based programs with little or no involvement of government clinics.
- Private medical practitioners who also deliver primary and secondary health care.

However, there are several private practitioners in Bangladesh who may not necessarily follow the DOTS strategy. This has created a fear in the country that multi-drug resistance TB may become prevalent in the near future.

The medicine required for curing the patient is distributed free of cost by the government and the cost of procurement and logistics is fully borne by the government. Under the TBC program, several difficulties are encountered in reaching out to the rural areas, more so to women, in the poorest of the poor category. About 7% of the patients drop out from treatment due to several reasons. The most common reasons include socio economic conditions, non-accessibility of the drugs at the patients' doorstep, and the opportunity cost of treatment to the patient.

Recently (1998) the Bangladesh government ministry of health and family welfare relooked at the program and included TB care as part of the essential health services package. The response to such a policy change is divided. Some fear that the TB program focus may be diluted; some feel that larger budget allocation to TB Control is now possible (Appendix 4).

According to some experts, TB control in Bangladesh will get out of control if it is not treated with a sense of emergency (See Appendix 5). The reasoning for this assessment is as follows:

There is a large stock of infected cases in Bangladesh. The detection rate among infected population is approximately ten percent. Hence, the increase in the actual number of TB disease cases is never likely to be covered at the rate at which the infected detections are being managed. Therefore, curing and liberating Bangladesh from the TB disease may not be a reality.

- To counter this situation, a three pronged approach has been suggested (Appendix 5).
- Advocating national TB program within the HPSP, so that TB program gets an uninterrupted supply of drugs, budget and managerial pool.
- Continue to operate TB program as a part of the communicable disease and also enlarge it in the context of reproductive health and child health sectors. This approach will provide an opportunity to attack TB in multiple schemes, one through the common route and the other through sector specific orientation.
- Take TB out of the health sector itself and provide a broad based inter-sectoral approach. Under this approach, TBC program would be seen as a national priority project.

The challenges in the implementation of TB control in Bangladesh are summarized in the recently conducted survey* (Appendix 6). The salient features of this study include:

- Most commonly found symptoms are evening temperature and weight loss
- Major source of information on TB is family relative (50%) Radio/TV (45%)
- 85% of the population sample had no idea of duration of treatment
- 25% identified cough for more than three weeks as a prominent symptom
- More than $3/4^{th}$ do not have any information on where to get the diagnosis and treatment
- Less than $1/5^{th}$ know where to get free treatment
- 85% do not know where to get free medicine
- Less than $1/6^{th}$ of households have been visited by Government health workers

Implementation by BRAC

BRAC was established as an NGO in Bangladesh in 1952. As of 2003, it is the largest NGO in the world. It employs 18,000 staff members on regular basis and uses double this number as part time workers. BRAC is aimed at the poorest of the poor in the society. It has a multiple set of activities to help the poor get rid of the poverty crisis; BRAC provides food security, dignity to the poor while living, promotes health awareness, helps to improve living conditions like better sanitation, healthy food and improved housing, adult literacy and primary education. Micro credit is a major activity of BRAC. It also helps people to establish micro enterprises to help them to graduate towards a poverty-free life.

BRAC is organized across Bangladesh in units called village organizations, which are the epicenter of all core activities. BRAC is divided into several divisions to focus on the range and mix of activities. The health division implements TB control project in Bangladesh. For a brief write up on BRAC, its mission, activity mix and the details on TB project implementation (See Appendix 7).

The BRAC model operates under the assumption that the medical supply would be made available by the Government of Bangladesh. The clinics and the laboratories established by the Bangladesh Government are available for case identification and confirmation. The community health care workers of BRAC are directly involved in identifying, screening and confirming patients' diagnosis with the help of the government established health care infrastructure. Once an individual is confirmed as a TB patient, he is advised/counseled/motivated to undergo the treatment. In order to enhance his motivation, the patient pays Taka 200, (which is roughly equal to US $ 3.5) as a deposit fee. Half of this fee is returned to him after the completion of the treatment as an incentive. Should the patient decide to leave the treatment in the middle, his deposit money is forfeited.

* This survey was conducted in one out of 450 sub-districts of Bangladesh. Therefore, the findings of the survey may not be applicable across the country.

BRAC follows the DOTS strategies systematically. The community health care workers are able to remove the social stigma attached to the TB disease by constant counseling. Since the community health care workers are part of the village organizations, they are easily accepted by the village population. The community health care workers also provide personal supervision in administering the drugs. Since the community health care workers are located in the villages, it is operationally easy for them to administer drug consumption. In this model, medicines reach the patient rather than the patient seeking medicines. The detection rate is 30% and cure rate is about 95%.

The cost of treatment per patient is US $12, which is cheaper by one third of the cost of treatment by the Government of Bangladesh implementation (Table 1). The cost of treatment of BRAC includes bondage money and the cost of community health care worker, which adds up to $4.If this is taken out of the cost of treatment, then the cost of treatment will be roughly half of the cost of the treatment by the Government of Bangladesh implementation. The major cost of Govt of Bangladesh implementation in patient care is the transportation cost which is equal to US $9. The BRAC program does not incur this cost as the people who are in charge of this activity are located in the local villages, and therefore this model is inherently cheaper.

The success factors of the BRAC implementation program are:

- It is based on DOTS strategy,
- Extensive use of community health workers
- Integration with other health care projects by BRAC to ensure economies of scale and economies of scope
- Acceptance of the community health workers in the community for counseling purposes, for helping the patients remove the social stigma, supervision of the treatment etc.
- Bondage money given by the patients and
- Easy availability and accessibility of the community health workers at the local field levels

These factors may not be replicable in other socio-economic contexts.

The Indian Model

The patient population in India is dramatically different from Bangladesh and other developing countries, whereas percentage may be comparable. India launched TBC program in 1955. Since then, there have been significant advancements (in India) in implementing this project. However, there are several pockets in the country where the disease is more prevalent, especially among the poor.

The Indian health care environment is characterized by a more sophisticated group of private practitioners. The Indian population is relatively more knowledgeable about the disease. The public health care infrastructure has a deeper penetration than what is

available in Bangladesh. Some of these factors play an important role in terms of the efficiency and effective manners in which the TBC program is managed in India.

India has developed an extensive health care infrastructure, consisting of primary, secondary and tertiary health care hospitals. This is extensively leveraged by the government agencies to deliver basic health care projects. In addition, over a period of time India has witnessed a tremendous growth in terms of private sector participation in health care.

Drug availability for TBC program in India is exceptionally high. Several non-governmental organizations and communities in India are regularly participating in the TB control program. The efficiency of the health care system and delivery model may be an issue in the Indian context, but it has a wider scope and is tuned to deliver large number of health care benefits to the poor in the country.

The Indian program implementation is DOTS centric. It is supported by extensive field research by Indian scientists. Several national and international consultants also play an important role in fine tuning the clinical research related to TB and the program evaluation. The Indian implementation model involves multi agencies like the state government health care system, central health care system, implementation agencies, international consultants, donor agencies are all involved in implementation. This multi agency involvement delays the implementation speed.

The government's support in India to health care is explicit. As far as the TB program is concerned, it is a declared national priority. There is a professional approach to program review and implementation. Surveillance mechanisms are routine and regular. To a large extent, data collection and MIS reporting is streamlined.

The BRAC and the Indian models assume that the TB patients would seek help from the existing health care system. Therefore the entire managerial effort is towards fine tuning the system efficiency, rather than converting the system to be customer focused. Several studies conducted on program evaluation and implementation also operate on this assumption. But in reality, patients would like to be helped with the drugs rather than they seek drugs from the health care system. For the status on the TB program implementation in India as well as in Bangladesh see Exhibits 8 and 9.

Involvement of NGOs and community participation in TB control

The involvement of NGOs and community participation in the TB control programs is a universal phenomenon (Appendix 3). The NGO involvement model yields better results in terms of detection as well as cure. The community health workers are able to influence the patients to undertake the treatment. They are also able to remove the social stigma associated with this disease. In addition, the community health care workers help to revive lapsed cases.

In short, CHW are able to increase the depth of surveillance, detection, cure and reduce prevention of relapse. In view of the fact that the NGOs operate with no profit motivation and the community health workers are located in the field where action is needed, the cost of commuting from the central location to the field is relatively low. This is an important and relevant component to the total cost of care. As such, the cost of treating a patient through a NGO partnership is relatively cheaper than the cost of treating a patient by the government mechanisms. As a consequence, prevention and cure reaches the remotest part of the country with affordable cost.

In addition to this, the NGO involvement is facilitated by the availability of free drugs, which are procured by the government. The community participation provides a decentralized approach to the health care delivery process. It enables deepest penetration and reach. It keeps the patient's motivation high and makes the supervision effective and economically cheaper. It is able to play a vital role in ensuring that the patients are committed to the treatment throughout the treatment duration. As a consequence, it seems viable to use this arrangement to ensure prevention, and efficient ways of case detection and care delivery.

The community services by and large operate with an assumption that they are responsible for the delivery of the health care and operational detail. They assume an extensive network of primary health care centers to support them. In addition, they also expect support in terms of training, organization and other infrastructure for capacity building, prevention and detection of cases. Therefore in some sense they are operating as a complementary partner for the national health care system to prevent and control many of the communicable diseases, more specifically TB. This arrangement can evolve as a perfect fit between operational effectiveness, vis-à-vis the technological and infrastructural support provided by the respective national health care system (See Table 4 and 5).

The urgency for an alternative model for TB control

There are three basic reasons to urgently develop an alternative model for TB control.

Firstly, TB is becoming an epidemic in several developing countries. The high rate at which new patients are generated and the inability of the existing systems to identify new patients at the same rate increases the existing stock of people who are already infected. Cure rate in several countries are significant (about 70%). However, there is less success in case detection. Most developing countries report a number, which is about 30 percent of the existing population for detection. Thus, a huge population is suffering from TB disease without even being detected by the implementation agencies. With the expected possibility of HIV infection, TB is likely to be a major health care burden in several developing countries.

The second reason is the possibility of development of multi drug resistance TB. Primarily two factors are responsible for such a possibility:

- There is an indiscriminate usage of medicines for TB disease by private practitioners in several developing countries. They do not conform to the prescription suggested by the DOTS strategy. Therefore, patients are given medicines, which are not appropriate in terms of dosage as well as frequency.

- A large number of patients (in the poorest of the poor categories who need help in TB cure), find the drugs to be very powerful. If they take the prescribed medicines properly under the supervision of the community health care worker, the initial TB symptoms disappear in the first two weeks. Therefore, many of these patients come to a conclusion (albeit wrong) that they are completely cured. Hence, they return to work and they do not necessarily complete the treatment. As a consequence, they continue to suffer from TB and its consequences.

The third reason that underscores the urgency of an alternative model is the changes in the health care policy of several developing countries and the possible adverse implications of these policies on the TB control project and its implementation. Some of these are discussed in Table 2. However, we describe here the major structural changes that can be expected in a developing country health care policy framework.

- The first major change that can happen in a developing country policy framework is the health care system gets integrated at the sectoral level which would essentially mean that the TB will no more be treated as a separate project, but this will be bundled as a part of the larger health program.

- Several developing countries are moving towards cost recovery mechanisms, and also a 'fee for use' kind of policy. This would require users to pay a certain amount of fee. This may demotivate TB patients and would adversely affect possibly the cure rate.

- Several countries are privatizing the hospitals and the associated services. Therefore, by implication the respective governments may not necessarily pay adequate attention to the TB program implementation. Private sector involvement provides access to large population, the cost of treatment can be different and the patients may have to bear this cost. In the absence of any effective reimbursement mechanism, this could be a major hurdle. The insurance schemes are getting enlarged to include TB treatment. Again the effect of this on TB care can be mixed.

- Resource availability for TB prevention is a critical issue. There is a constant need to activate funding mechanisms by which adequate funds are available for TB control. Even if the funds are available, how the funds are being allocated is decided by the local government priorities as well as the priority set by the international donor agencies involved in these activities. As a consequence of this if appropriate mechanisms are not set in place, TB control may not get the attention it deserves.

To summarize, the emerging policy changes in the health care sector in developing countries would have a significant impact on the management and effectiveness of the TB control projects. The multi drug resistance TB is a reality. TB is already becoming an epidemic in many of these countries. Therefore, there is an urgent need to look at alternative models by which the TB cure can be delivered faster.

The logic of community based model

It is important to notice that Bangladesh has got a vast number of TB patients who are either not detected or, are in the process of being treated. The awareness of the disease among common people is moderate to good. The (potential) patients are spread all over the country. Poverty alleviation is a serious issue. Therefore, the Bangladesh situation is an idealistic situation, which provides all possible challenges in TB control. Yet the BRAC model is very successful and reports a cure rate of 95%. What made this possible when several governmental agencies are struggling to implement the program with moderate success, if not complete success? In order to understand this we need to appreciate that the entire TBC program activities can be divided into four major activity groups viz. (a) core, (b) management and operational support, (c) auxiliary and (d) enabling.

A brief summary of the activity groups is as follows.

- Core activities: Identification of new patients, sputum microscopy, making diagnosis, ability to conclude whether a patient has TB disease or not, identify and prescribe a treatment plan, treatment supervision and patient evaluation at the end of the treatment.

- Management support: Notification of the patient cure rates and mechanisms that are available to retrieve the defaulters who had started the treatment but are not willing or unable to continue with it. Maintenance of records for the purpose of reporting and the project evaluation.

- Operational support: Drug procurement, supply management in the health care infrastructure, the network of laboratories which will enable the health care community workers to submit the samples collected for testing to arrive at a conclusion related to patients diagnosis.

- Auxiliary activities: Training, capacity building, monitoring mechanisms, demographic surveillance, quality assurance, interfacing with international agencies, funds generation, budgeting, and performance evaluation.

- Enablers: Activities that are used to enhance community awareness, issues related to addressing the stigma associated with TB, increased patient and CHW motivation, encourage compliance with the treatment by the patients, monitoring ongoing care, support to patients and their families to ensure that patients do not dislodge themselves from the treatment.

From the above description of the activities involved in TB control, it should become extremely clear that several activities are effectively performed either at the centralized level or at a decentralized level. There is no ideal situation as what is the optimal way of doing these activities (See Table 3). As a matter of fact, we need a hybrid combination of decentralization and centralization in executing TBC activities. One of the reasons why many national health care delivery program have not been so successful is that they have chosen predominantly a centralized orientation without an appropriate involvement of decentralization of activities.

Operational Philosophy: While TB programs assume at the micro level the active involvement of patients, the entire delivery mechanism is patient passive. It does not involve the patient directly. It operates with the assumption that the program implementation is the key objective and the patient is subordinate to the program implementation.

Economics of execution: The economics of execution is very attractive at the local and decentralized level as far as the patient care, patient monitoring, retrieval, cure notification, revival of defaulters, patients and relatives motivation etc. The economics of scale is far better at the central level for capacity building, drug procurement, drug distribution, training activities, monitoring, MIS etc. So we need a winning combination of all these to ensure that the program does not suffer and the implementation is effective.

Program Orientation: TB program implementation suffers from a supply driven syndrome rather than a customer driven approach. Usually, there is a centralized agency, which formulates the implementation policy. This policy percolates down the line, to the regional office, to the district office and to the primary health care centers, but (possibly) the patient is not necessarily involved in the entire exercise. The entire TB program orientation in the past has been driven by the fact that the program will look for patients rather than the patients looking for help. A significant change in this orientation is necessary to make an overall impact on program efficiency.

Patient Cost: For a TB patient, there is a significant cost involved in getting treated. For example, most of them are unskilled or semi skilled workers; they do not have adequate safety network nor savings. Therefore, what is necessary and important for a patient in the short term is not his life but the trade off between the cost of getting treated vis-à-vis the opportunity cost associated with foregoing the revenue for not going to work on a given day. Therefore, any program, which expects a patient to walk up to the clinic and get treated, is likely to be demotivating from the patient's point of view.

Reach and Access: The logistics related to patient care are terribly loaded against the patients who are located in the remote and under-developed areas. Usually they suffer from mobility problem because of the poor infrastructure. Even if the infrastructure is available, the transportation cost is not affordable to many patients.

To summarize, the operating philosophy, orientation to patient care, implied cost to the patient, limited access to health care (due to wide spread of patients) and the logistics cost of accessing the treatment are some of the reasons why the centralized model is not so effective in preventing and/or curing TB in developing countries.

A generalized model

Now, we discuss how community based workers (implementation agency) provide a winning combination in executing several elements of the value chain related to TB control program. In this particular section we develop a framework for an ideal model for TB control.

Policy and operations confusion: It is imperative to understand that conventional implementation combines policy and operations. What this essentially means is, that there is a policy set up. The policy set up is taken down the line. When it goes to the Taluka level and sub Taluka level, there is a confusion between policy level options and operational level activities. This confusion generates inefficiency in the system. So there is a need to separate policy level decisions and operational details. This we think is the very first requirement in implementing a successful TBC program. It is worthwhile to notice that the BRAC model in Bangladesh is very similar to the structure of the government model. However, the BRAC model has been able to distinguish clearly between policy options and operational details.

Economics of Scale: Patients are spread geographically in remote areas. Therefore for a program to be successful reach and penetration are two most important attributes. When reach and penetration are demanded, economics of scale can be a source of disadvantage. Managing this conflict is an important strategic trade off.

Economics of Scope: In the BRAC model, the base level workers are far more dispersed than the government model. They are part of the community, and are located in the villages. Therefore their ability to be effective without adversely adding to the cost of care is very high. This is the core of the BRAC model in terms of its efficiency. In terms of its effectiveness, the reach and the micro orientation of the model is the key.

Inefficiency of the Government model: It is also important to recognize that the government implementation (model) in several developing countries including Bangladesh is inefficient beyond a certain point in the hierarchy of the national health network. For example, the policy and the implementation may be very effective in terms of capacity building at the central level as well as at the regional level. When it comes to the operational level in terms of scouting for new patients, identifying and diagnosing patients, monitoring patient's health conditions, evaluating whether the patient has been cured or not, a centralized planning and operations set up is not efficient, vis-à-vis a decentralized operations and control system.

An appropriate model: An appropriate model is a combination of centralized planning and decentralized operations. Based on this observation we generate a generic community health care worker model. The most important thing to recognize is that we need to build a set up which will be a combination of centralized planning and decentralized dispensation. The centralized model will include capacity building in terms of identifying people who should be trained and the mechanisms to train them (like the duration in which the training can be imparted, content etc.) The centralized model will also include funding arrangements related to how to generate funds, how the allocations are made and what activities will take priority etc. based on contextual information. For example, in some places, detection would take priority over cure, even though both of them are equally important.

Information management: Again, information management is better done at a centralized level because of the need to consolidate data and get a national picture. A centralized planning is necessary to percolate information from top to bottom (to the field) and from the field to the planning agency to ensure that the program monitoring and implementation is done with adequate care and data support.

Procurement of drugs and supplies: This is best done centrally to take advantage of economics of scale. The TB drugs are standardized. The medical supplies are well known. It makes immense economic sense to buy them at a centralized location and ensure that the distribution is effective through the health care network.

Treatment Policy: This includes the type of medicines used, what dosages, how frequently they are to be reviewed. These concerns are all best decided at the central level because we are looking at practically one disease for which the cure is known and proven in several countries.

Lab Support: Physical establishment of these facilities is centralized because of the investment required. Further the need to develop quality systems, standards, and streamlined procedures would suggest a centralized laboratory support.

To summarize, capacity building, funding, funds generation and its allocation, information management, procurement of drugs and its distribution, treatment policy, technical and clinical support are necessary to implement a program. All these functions need to be centralized since

- they can take advantage of economies of scale
- they need collaboration with possibly international agencies outside the country
- they require significantly higher level of technical input
- these activities are usually knowledge driven rather than operational efficiency oriented

For a TB control program to be effective and efficient, these centralized activities should be supported by a significant amount of a decentralized operational set up. The decentralized set up will include activities related to new cases detection, counseling

patients to take treatment and complete the treatment course, supervise the treatment, evaluation of the patient at the end of the treatment and promoting and propagating TB control program so that indirectly or directly people are identified should they have a problem. These activities are better performed in a decentralized mode. Again the reasons for such a choice are very simple. First of all, these are operationally driven activities, and they do not need higher element of technical input. Second, the activity locations are widely dispersed and are focused on individuals. Third, there is no economics of scale in consolidating these activities.

A combination of this planning and operational mix of activities would ensure that TB control delivery mechanisms are worthwhile; they are effective in terms of prevention, detection and cure rate. Such a model would result in optimum utilization of resources used in TB control programs. Individual nations and policy planners need to move towards this model to make an impact in this area.

Innovations: Can the peripheral laboratories that are kept at the primary health center be made mobile? This would ensure that the detection is also moved towards decentralization level at the village. It may require innovative technological inputs.

CHW consolidation: In the proposed model, there may be a need to consolidate the community health care workers at an area level. We elaborate on this. Community health workers are working at the village level. They are operating under specific technical guidelines given to them. They are essentially used to provide operational support for the program implementation. These village clusters need to be coordinated with certain kind of area managers. This is the point at which there is a change over between the centralized planning system and the decentralized operational setup. The centralized system moves away from this point and the decentralized system takes over from this. The area coordinators need to be part of the larger health care system. When we move upward from the area coordinators there will be policy decisions, and moving downwards from the area coordinators will be a mix of operations and policy, and somewhere down the line, it will move towards purely operations and control.

To summarize, an efficient TB program would have an infrastructure, which is completely centralized and organized in modules. There will be a policy committee, which will decide how and what is to be done, when and where, etc in terms of time frame, targets, review, and program monitoring. It will be a part of the concerned ministry. This policy will percolate down, in terms of creating infrastructure which will move from the national level to the regional level, regional level to the district level, district level to the sub-district level, and probably to village clusters.

The whole bunch of community based workers who are placed in the field, will actually be executing the program implementation. They need to be coordinated at the regional level. The regional level needs to be cemented with the policy planners as a part of the infrastructure. The community health workers would also generate patient related information and data. This would be consolidated by the coordinators for transmission to policy planners. Such a model would undoubtedly be far more effective than (a) a purely

centralized model or (b) purely decentralized model or (c) a centralized model with an active involvement of community participation.

Such a model can be used not only for TB control, but also for several other health care and socially important and relevant projects like population control, adult education, health and nutrition etc. This would ensure the viability of these models/structure and lend them further credibility in helping the process of social change in developing countries.

Conclusion

In this paper we have evolved an alternative model based on the experience of Bangladesh by which tuberculosis control program can be made more effective as well as resource efficient.

Developing countries are sitting on the verge of a TB epidemic. It is pathetic knowing the fact that this disease is curable, but because our limitations several useful lives are lost, especially in the developing countries among the poorest of the poor. Therefore, this program has to be dealt with some sense of urgency.

Conventional implementation methods have serious limitations. For example, the government driven model has got its own limitations. NGOs help is proven to be useful and effective. But the NGO model does not realize its full potential and therefore there is a need to recast this model.

The BRAC model in Bangladesh is known to be effective and this needs to be strengthened. It is to be refined for replication wherever necessary. What we have advocated in this paper is a hybrid combination of a centralized planning structure with decentralized operating responsibilities. The motivation to do such an exercise was the fact that the results from the BRAC model are consistently encouraging. In short, we are arguing that the community health worker model needs to be consolidated, expanded in terms of its scope and content and it should be integrated with the existing health care infrastructure.

There has to be a fundamental departure in the thinking among the policy planners to deliver effective TB treatment among communities. They should move away from a facility center orientation to a patient centric approach.

Acknowledgement

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Appendix 1: The Structure of Laboratory Network in Bangladesh

The TB laboratory network in Bangladesh is organized according to the three levels of the general health services, viz. Central (or national) laboratory, Intermediate (or district) laboratory and Peripheral (or Upazila) laboratory

Central reference laboratory (at Sajamoli in Dhaka)

- Acts as supervising reference laboratory for the intermediate laboratories in the region (District)
- Is able to perform microscopy, culture for mycobacterium, drug sensitivity testing (DST) and species identification
- Trains and supervises staff of the intermediate laboratories
- Collaborates with a WHO-accredited supranational reference laboratory outside the country
- Implements quality control for district/chest clinic/hospital and upazila/special services laboratories

Intermediate laboratory (at the District hospitals and Chest Clinics)

- Is able to perform basic microscopy
- Carries out External Quality Assessment (EQA) of smear microscopy
- Trains and supervises the staff of the peripheral laboratories

Peripheral Laboratory (upazila level, union sub centers and private clinics)

- Is able to perform basic microscopy for diagnosis according to NTP standards.

Source: *Laboratory Manual on Smear Microscopy for Tuberculosis and its Quality Control in the NTP of Bangladesh, Third Edition-2003, pp. 12-13.*

Appendix 2: DOTS - Key facts

- Internationally accepted strategy for TB control in 148 countries worldwide.
- One of the most cost-effective health interventions available today.
- Services are now accessible to 60% of the population in the South-East Asia Region.
- It has achieved treatment success rates of up to 85% in every country in the South-East Asia Region.
- It has more than doubled the accuracy of diagnosis of TB.
- It ensures the full course of treatment, achieves high cure rates.
- It prevents thousands of new infections by curing infectious patients.
- It cures TB equally well among people living with HIV/AIDS.
- It prevents the development of Multi-Drug-Resistant TB.
- Both diagnosis and treatment are available free of cost in government clinics in DOTS areas.

Source: *National Tuberculosis Control Program-Bangladesh, Activity Report: 2002, pp. 5-6.*

Appendix 3: Principles of Private organizations/NGOs involvement

First Principle: Responsibility of Government through National TB Control Program

Local government has the primary responsibility for maintaining and improving public health. Successful tuberculosis control requires a coordinated approach with standardized diagnostic, treatment, and information systems. The government therefore takes a lead in developing and maintaining these systems. Private organizations/NGOs, along with government and other relevant agencies, become part of the national TB control program, and follow the same policies.

Second Principle: Private organizations/NGOs role is facilitative and supportive

Many organizations have recognized that their primary role is to facilitate and support to help build capacity of individuals, communities and governments. This is particularly important when control of TB is considered.

Third Principle: Building on Existing strengths

There is no ideal model for private organizations/NGOs involvement in TB control. There are many alternative approaches, and the most suitable one will depend on the nature of the organizations. It will depend on the NGO's strength, skills and experience. If an organization/NGO has experience running hospitals or clinics, then it will be relevant to include effective diagnosis and treatment services. Alternatively, if a private organization/NGO is involved in providing community-based health care, it is appropriate to incorporate DOTS through volunteers, community health workers, village doctors, traditional birth attendants etc. Different approaches are not exclusive and a combination will often be required for advocacy, health education and community based TB care.

Source: National Tuberculosis Control Program-Bangladesh, Activity Report: 2002, pp. 19.

Appendix 4: National TB Control Program of Bangladesh

Background

Tuberculosis (TB) is a major public health problem in Bangladesh, which causes every year the illness of at least 300,000 new people and the death of about 70,000 persons in the country, according to the present estimations.

The World Health Organization (WHO) recommends the Directly Observed Treatment, Short-course (DOTS) strategy to control TB and prevent multi-drug resistance. The DOTS strategy consists of increased government commitment, effective diagnosis, standard treatment given under direct observation, secured drug supply, and systematic monitoring and evaluation. Bangladesh adopted this strategy in 1992 and started the field implementation of the revised National TB Control Program (NTP) at the end of 1993. By now, NTP provides DOTS services to about 95% of the country population and with the significant support of NGOs.

Since July 1998, NTP is administered under the Health and Population Sector Program (HPSP) integrated into the communicable disease control area of the Essential Service Package (ESP). NTP has experienced the challenge of moving from a project to a program approach, seen key supportive services (e.g. training, procurement, health information, behavior-change-communication, supervision, research, health education) unified under a sector wide approach reform.

Key Findings

The NTP in Bangladesh continues to be an example of successful collaboration between government and NGOs.

Its (NTP) overall treatment success is above 80% (target 85%), which steadily increases every year. However, its case detection is lower than 30% (target 70%). The NTP performances range widely, from the best results in the rural upazilas (by both government and NGOs) to the lowest results in the municipality/metropolitan areas (mainly by government chest institutions). The NTP services as still insufficiently known by the people, insufficiently distributed in the territory, insufficiently friendly to women and their children and to the general population at large. On the other side, most of the doctors working in the private sector and in the main referral and teaching hospitals of the country refuse the treatment regimens recommended by NTP, producing quite a number of prescriptions with unsupervised Rifampicin that produce multi-drug resistance.

Key Recommendations

The Government of Bangladesh should ensure adequate funds in support of DOTS as an important part of the ESP. Development partners in the global effort to stop TB and alleviate poverty should enhance their support. To achieve the global targets for TB control by 2005, the NTP requires at least US$25 million.

To the MoH&FW

- The MoH&FW should promote capacity building of the NTP central unit for planning, implementation, coordination, monitoring and supervision of DOTS.

- The MoH&FW should ensure that the NTP has access to appropriate support services. Improved collaboration between the MoH&FW and the NTP is needed to ensure that the unified training, health information system and drug supply system are consistent with DOTS. Logistics (including transport), supervision, behavior-change-communication, and research support should be available to the NTP. Private provision of support services should be encouraged in line with HPSP.

- The MoH&FW should align TB services into the DOTS strategy, including government facilities, NGOs, corporate sector, teaching institutions and private providers. Revised NTP treatment regimens are proposed to improve consensus among the different providers.

- The MoH&FW should maintain and expand the existing partnerships with NGOs.

- ESP in community clinics should make DOTS more accessible to people in rural areas. The MoH&FW should ensure the effective delivery of TB services through proper training of staff, uninterrupted supplies of TB drugs, accurate registration of patients and an efficient referral system.

To the NTP

- The NTP should support DOTS in hospitals and establish partnerships with private providers through exploring the feasibility of supplying free anti-TB drugs in exchange for compliance with NTP guidelines, case notification and treatment outcomes.

- The NTP should make its behavior-change-communication strategy a priority to support advocacy, extend partnerships with providers, and increase demand for DOTS.

Source: National TB Control Program of Bangladesh, Review and Strategic Plan 2001-2005, 9 August 2001, Ministry of Health and Family Welfare, Directorate General of Health Services, Assisted by the World Health Organization, pp. 1-3.

Appendix 5: TB and Health Sector Reforms in Bangladesh*

Context

Bangladesh already has over 60 million people estimated to be infected with tuberculosis. It is now estimated that every year, 300,000 people in Bangladesh develop active tuberculosis and 60,000 people in Bangladesh die of tuberculosis in a year. Stopping the large number of tuberculosis deaths therefore cannot be based only on a paradigm of health care and TB control that is primarily focused on reducing further infections in the population.

Bangladesh has successfully developed essential service facilities for tuberculosis control through all 460 rural Thana Health Complexes (THCs). These commendable efforts raised NTP's case detection levels from almost zero to about 60,000 per year. However, this remains a mere 20% of the 300,000 new cases each year.

The two paradoxes of NTP

- **The reform paradox:** The sector-wide approach of HPSP has required the merger of all vertically managed projects. While this will lead to integrated health services. major management functions such as planning, training, procurement (including drugs), financial management, etc. of the 100+ projects are also being integrated under separate line directors. In effect this has further 'centralized' program management, not only losing some of the flexibility needed by individual programs like NTP, but initially reducing program momentum and deflecting attention away from the real challenge of reducing the health burden of the poor.

- **The sustainability paradox:** Even if NTP fully achieves its global TB control objectives of detecting 70% of the existing pulmonary TB new smear positive cases and curing 85% of the detected cases, it is likely to continue to remain unsustainable even by the end of the HPSP reforms. This is because of the 60 million people already infected in Bangladesh, so that despite its commendable achievements, the NTP may not reduce in total the number of active new cases emerging nor the number of TB deaths.

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* *Tuberculosis and Health Sector Reform in Bangladesh, A Concept Paper, Bruce Currey, FinalDraft, pp. 2-3.*

Suggestions

- **Institutionalize the NTP within HPSP** through decentralized management and partnerships with NGOs, the private sector and existing community institutions, to rapidly reduce TB deaths amongst the most vulnerable.

- **Broaden the Scope of NTP beyond communicable disease control** by ensuring that TB is also addressed in the reproductive and child health programs of the ESP.

- **Paradigm Shift for the NTP beyond the health sector.** The 1974 famine deaths mobilized massive development efforts to put famine in the past within the next quarter century. Similarly the much larger number of TB deaths today should spearhead **inter-sectional development approaches** to put TB in the past within the next quarter century.

Appendix 6: Healthcare Survey in Bangladesh

Prevalence of suspected cases of Pulmonary Tuberculosis

Information was collected for 15,000 residents of 3000 households in Keranigonj Upazila of Dhaka District. Only one member of the household was interviewed (preferably the elderly women) and information was collected for all the members of the household. After interviewing 3000 people, 450 suspected cases were found which had at least one symptom of Tuberculosis out of 15,000 residents. In other words the rate of suspected cases with at least one symptom of Tuberculosis was 34/1000 populations.

Frequently found sign symptoms of Tuberculosis among the responders

The most common symptom among the suspected cases was evening temperature 213 (47%) followed by weight loss 174 (39%)

Source of Information about Tuberculosis

The major source of information about the tuberculosis was a relative (48%), followed by Radio/TV (45%). The other sources of information included: family members (13%), Neighbors (9%), Health workers (6%), Book (3%), NGO (0.2%), Paper (0.2%) and others (9%).

Knowledge about duration of treatment

85% of the responders did not have any idea about the durations of treatment required for complete recovery of a tuberculosis patient; while 3% had wrong idea about the duration of treatment. Only 12% respondents could correctly mention that a tuberculosis patient was required to receive more than three months treatment for full recovery without relapse.

Knowledge about Sign Symptoms of TB

Responders interviewed were asked about the possible symptoms a man or women display if they suffered from tuberculosis. Most of the responders interviewed (25%) mentioned `cough for more than 3 weeks' as a prominent symptom for tuberculosis, followed by blood with cough (23%), fever, weight loss, chest pain and loss of appetite 10%, 6%, 12% and 12% respectively. However, 64% of the responders had no idea about the symptoms of tuberculosis, indicating a large number of people still ignorant about symptoms of TB.

Knowledge about examination for TB

More than three-fourth of the responders (77%) did not know where they were required to go for treatment.

Knowledge about place of free examination

Amongst the 23% who knew where to go for free examination, 34% mentioned that they should go to Mohakhali TB hospital if they required examining about the suspected TB cases followed by Chan Khar pul Hospital (25%). However only 15% mentioned the Thana Health Complex (THC).

Knowledge about availability of free medicine for TB

About 83% respondents did not know where they were required to go for free medicine in case they developed tuberculosis infection.

Domiciliary Services

Out of 3000 correspondents, only 16% admitted that they had received any household visit by any government health worker during the last 3 months. Amongst the houses visited by the health workers only 3% said that they were given advise about tuberculosis.

Source: Prevalence of Pulmonary Tuberculosis in Dhaka: The Final Report, Investigating and identifying the clinical cases of Tuberculosis for Subjects ages 10 years and above,Civil Surgeon Office, Dhaka, pp. 8-12.

Appendix 7: Bangladesh Rural Administrative Committee (BRAC)

Bangladesh Rural Advancement Committee (BRAC) is a non-governmental organization focusing on alleviating poverty and providing education as well as medical help to the poor in Bangladesh. This is done through its three core program areas: Economic Development, Health and Education. Set up in 1972, BRAC has evolved into the largest NGO in Bangladesh with 27,000 regular staff and 34,000 part-time teachers working in 61,924 villages throughout the country. It is present in 42 out of 64 districts in Bangladesh.

It's Health, Nutrition and Population Program is a "combination of preventive, curative and rehabilitative health services," These services are being provided to more than 31 million people through trained health workers and female health volunteers or Shastho Shebikas. BRAC's Essential Healthcare Package is delivered primarily through Shastho Shebikas who focus on issues related to water and sanitation, family planning, immunization, pregnancy related care and TB in rural areas.

TB is a major health concern in Bangladesh with 300,000 new cases and 70,000 deaths occurring every year. BRAC collaborates with the government to implement its TB control program 126 upazilas. While the government provides drugs and laboratory supplies BRAC implements the program through Shastho Shebikas who are responsible for identifying the suspects, ensuring DOTs, follow-up of the patients, and referring to cases with complications.

Every quarter BRAC prepares a standard TB treatment report at Upazila level in consultation with government officials. It is subsequently compiled at district level, division level and finally at the BRAC central office. BRAC central office submits it to the government. In 2002, 139,838 sputum examinations were done and 17,684 TB patients were diagnosed. Nationally, Bangladesh has a TB detection rate of 30% and cure rate of 85% while BRAC's TB detection rate is 42% and cure rate is 95%.

Source: *Field visit and conversation with members of BRAC.*

Appendix 8: India*

India has 35 states and union territories which are divided into nearly 600 districts. Although state governments are primarily responsible for health care, TB is one of several health programs supported by central government funds. The Revised National TB Control Program (RNTCP) designed by the Government of India in 1993 and launched in 1997 introduced DOTS and put TB control high on the public health agenda. This resulted in the allocation of more resources for TB control, improved laboratory diagnosis, and the adoption of directly observed treatment, standardized drug regimens, and reporting methods.

Progress in TB control in India

Indicators

• Treatment success 2000 cohort	84%
• DOTS detection rate 2001	23%
• Proportion RNTCP budget available	100%
• Government contribution to RNTCP funding, including loans	90%
• Government contribution to total TB control costs, including loans	97%
• Proportion government health expenditures used for TB	1.9%

Constraints to achieving targets

- Uncertain funding from 2005 onwards
- Challenge to maintain quality of TB services with rapid expansion to the remaining 450 million people
- Lack of TB awareness in some parts of the community
- Decentralization without adequate local management, supervision, and monitoring

Remedial actions needed

- Continue efforts to obtain funding from the GFATM and other sources
- Increased supervision of implementation areas
- Strengthen public-private partnerships to standardize and facilitate the delivery of TB services
- Central government to appoint additional staff and provide management training for RNTCP

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* *WHO Report 2003, Global Tuberculosis Control, Surveillance, Planning, Financing, Communicable Diseases, World Health Organization, Geneva, pp. 79-82.*

Trends	1998	1999	2000	2001
DOTS population coverage (%)	9	14	30	45
Notification rte (all cases/100 000 pop)	113	123	111	106
Notification rate (new ss+ cases/100 000 pop)	29	35	35	38
Case detection rate (new ss+, %)	34	43	43	47
DOTS detection rate (new ss+,%)	2	7	12	23
DOTS treatment success rate (new ss+,%)	84	82	84	-

Partnerships

Technical support to India is provided by WHO and includes a network of 60 locally recruited TB consultants who assist state and district officers to monitor and implement the program. National efforts to build technical partnerships have been established with NGOs, medical colleges, community health volunteers, and the private sector.

Appendix 9: Bangladesh*

Overview of TB control system

The 1998-2003 Health and Population Sector Program (HPSP) had integrated the National TB Program into the reformed Essential Services Package operating across the health sector. Health policy is directed at improving equity and access to all essential health service, including TB care. The DOTS strategy was introduced in 1993 and nominally covers 95% of the country.

Progress in TB control in Bangladesh

Indicators

• Treatment success 2000 cohort	83%
• DOTS detection rate 2001	26%
• Proportion NTP budget available	72%
• Government contribution to available NTP funding, including loans	53%
• Government contribution to total TB control costs, including loans	82%
• Proportion of government health expenditures used for TB*	3.0%

Constraints to achieving targets

- Funding gap of US$2.9 million in 2003
- Inadequate training, supervision, and monitoring resulting from problems implementing health sector reform
- Too few skilled managers
- Private sector not compliant with DOTS

Remedial actions needed

- Hiring and training of managerial staff
- Better training and supervision of staff to improve monitoring
- Better collaboration with private sector

Partnerships

NGOs have contributed to the treatment success and overall coverage achieved by the NTP, providing DOTS services to 55% of the population under MoUs. BRAC and DFB presently provide TB services to 40% of the population.

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* *WHO Report 2003, Global Tuberculosis Control, Surveillance, Planning, Financing, Communicable Diseases, World Health Organization, Geneva, pp. 60-62.*

Trends	1998	1999	2000	2001
DOTS population coverage (%)	90	90	92	95
Notification rte (all cases/100 000 pop)	55	59	55	54
Notification rate (new ss+ cases/100 000 pop)	29	28	28	29
Case detection rate (new ss+, %)	26	26	26	28
DOTS detection rate (new ss+,%)	23	23	25	26
DOTS treatment success rate (new ss+,%)	80	81	83	-

Appendix-10: Sustainability Factors

BRAC Project: (in Bangladesh)

- Highly motivated staff, and well designed training programs
- The program is integrated into the already existing and highly successful community based health projects
- Greater acceptability of the services by DOT providers as they belonged to the same village community to which the patients belonged to.

SEWA Project: (in India)

- The program was integrated into the already existing community based health care projects, which allowed evolving strategies to meet the socio-psychological and economic needs of the TB patients and their families.
- The program involves members committed for voluntary service for non-material rewards and hence greater motivation by the CHW to work for the benefit of the program.
- It helps in reducing the problems of accessibility, physical, economic as well as social, for the patients.

***Source:** Sharma BV, 2002, Wold Health Organization, Community Contribution to TB care: An Asian Perspective, pp. 35-36.*

Table 1: Costs for tuberculosis control in BRAC and Government areas

Item	Cost (US$)	
	BRAC programs (with CHWs)	**Government Programs (without CHWs)**
Diagnosis		
Loss of income	0.7	1.4
Transportation costs	0.5	2.2
Examination fees	0.1	2.4
Total	1.3	6.0
Intensive phase treatment		
Loss of income	2.8	2.7
Transportation costs	0.0	3.4
Total	2.8	6.1
Continuation phase treatment		
Loss of income	1.4	2.1
Transportation costs	0.0	2.9
Total	1.4	5.0
Sputum monitoring		
Loss of income	0.9	0.8
Transportation costs	0.8	1.1
Total	1.7	1.9
Bond money	3.0	-
Patient and CHW costs		
Total patient costs	10.2	19.0
Cost of time given by a CHW for TB control	1.0	-
Total costs (patient and CHW) Per patient	12.2	19.0

Source: *Cost-effectiveness of community health workers in tuberculosis control in Bangladesh, Md. Akramul Islam, Susumu Wakai, Nobukatsu Ishikawa, A.M.R.Chowdhury, and J. Patrick Vaughan, Bulletin of the World Health Organization 2002, 80 (6), pp. 447*

Table-2: TB control and health care reform strategies

Reform Strategy	Opportunities	Risks
Decentralization program integration	• Increased involvement of NGOs and community groups in case-finding and case-holding	• Insufficient political recognition of TB problem • Insufficient technical or administrative capacity (procurement, training, supervision) • Loss of accountability • Problems in enforcing norms, standardized surveillance
Cost-recovery/ User-fees	• More resources for local service delivery • TB services may be exempted • Subsidies or exemptions for the poor • Patients may perceive that services improve with payment	• Less access for the poor • Providers focus on revenue-generating patients
Extension of essential services coverage	• Increased resources for case-finding and treatment extension	• TB may not be selected as an element of the essential services package • Insufficient attention given to how to deliver services coherently
Sector-wise approach	• Increased sustainability • Reduced duplication or conflicts in donor interventions • Coherent plans for resolving systemic problems • Increased flexibility in use of resources	• Focus on process rather than outcomes • Priority-setting more politicized • Loss of resources for key disease control inputs • Dedicated funds removed before new resource flows secured
Privatization of hospitals and services	• Incentives for most cost-effective care (e.g. less X-ray; more smears) • Contracts for TB care with payment contingent on results	• Faulty drug procurement • Less motivation to serve TB patients • Incentive to charge patients or restrict hospitalization
Involving the private sector	• Improve involvement of private sector to increase quality of TB treatment • Increased accountability through performance-based contracts	• Insufficient incentives to collaborate in TB control, respecting national technical norms • Insufficient enforceability or clarity in contract terms • Poor outcomes, drug resistance
Insurance schemes	• Increased overall service coverage of the poor • Increase in timely health-seeking behavior • Reduced or no fees for service • TB indicators can measure quality	• Public health interventions may not be identified for coverage • Reduced care of remaining uncovered populations • Lack of support for technical oversight and capacity-building

Source: *Weil DEC. Advancing tuberculosis control within reforming health systems, International Journal of Tuberculosis and Lung Health, 2000, 4:597-605.*

Table-3: Summary of Important Features of Published Studies Describing Schemes of Community Contribution to TB Care

Year	Country	Location	Setting	No. Patients	Form of TB	TB treatment supervisor	Results
1978	Philippines	2 rural slums 1 urban slum	Rural Urban	175	Smear positive PTB New and retested	Lay volunteers	90% cure rate
1990	Philippines	Manila	Urban	144	Smear positive PTB	Church group volunteers	80% treatment success rate
1997	Bangladesh	Thanas	Rural	1525	New smear positive PTB	Members of rural advancement committee with financial incentive	Cure rate >85%
1997	Haiti	Artibonite Valley	Rural	138	New smear positive PTB	Lay persons and former patients Financial incentive	87% treatment success rate
1996	South Africa	Western Cape	Rural	105	All forms	Farm workers and volunteers	High rates of adherence to treatment (no results of treatment outcome given)
1997	South Africa	KwaZulu Natal	Rural	535	All Forms	Community health workers, lay people, volunteers	>85% treatment success rate in survivors
1997	Nepal	4 national demonstration centers	Rural	270 New smear positive cases 310 other forms	All forms	Community workers, social workers	85% cure rate

Table-3 Contd....

1997	Indonesia	North and Capital provinces of Sulawesi	Rural	1797	New smear positive PTB	Health care workers (50-40%) Women organization volunteers (50-60%)	88% cure rate
1996	China	12 provinces	Rural and Urban	55213 new smear positive cases 57629 previously treated smear positive cases	New and previously treated smear positive PTB	Village doctor	90% cure rate among new sm + PTB cases 81% cure rate among previously treated sm + PTB cases
1996	Nepal	Eastern and central Nepal	Urban and peri-urban		All forms	Health center, family/community, none	91%, 57%, 34% cure rate respectively
1993 1998	Sulawesi	4 rural districts in Central Sulawesi including 224 villages and 362,000 people	Rural/ Remote	12000	All forms	Health center, family/community	93%, 87% treatment completion rate for smear positive and smear negative cases respectively
1992 1995	South Africa	1 district in Northern Province	Rural	928	All forms	Various community volunteers	Treatment completion rate increased from 61% to 85%

***Source:** Maher D. van Gorkom JLC, Gondrie PCFM, Raviglione M. Community contribution to TB care in countries with high TB prevalence: past, present, and future. International Journal of TB and Lung Disease 1999; 3: 762-768*

Table-4: Summary of Findings from Literature Review of Community Contributions to TB care in Asia

Year	Setting	Coverage	Community involved	Components of care provided	Effectiveness
1982	Tribal hamlets in Tamil Nadu, India	62 hamlets and 96,000 people	Literate tribal youth	Identification of possible cases, sputum collection and transportation to health unit	20% increase in case finding
1997	Slum areas in Madhurai city, Tamil Nadu, India	46,000 people	Student volunteers	Dispense drugs and trace defaulters	Treatment completion rate 83% Successful default retrieval 57%
1987	Rural villages in Tamil Nadu, India	44 villages	Dais (traditional birth attendants)	Identification of possible cases, collection and transportation of sputum samples, drug distribution, and DOT	600 possible cases identified in 5 years (2.8% smear positive) Cure rate 85%
1997	Slum areas in Ahmedabad City, India		Community health workers	Identification of possible cases, patient motivation, DOT	382 possible cases identified in 4 years Cure rate 82% - 93%
1997	4 rural community demonstration centers, Nepal		Social workers and community workers	DOT and defaulter tracing	85% cure rate
1990	Urban and rural settings, Philippines		Lay and church group volunteers	DOT	80-90% cure rates
1991	Rural Thanas in Bangladesh		Community health workers	Identification of possible cases; referral; DOT; drug distribution; defaulter tracing; health education	Cure rate 66%
1996	Rural and urban provinces, China		Village doctors	DOT	80-90% cure rates
1997	Rural Thanas in Bangladesh	17 Thanas	Community health workers	Identification of possible cases; referral and DOT; drug distribution; defaulter tracing; health education	81% - 86% cure rates

Source: *Sharma BV. Community contribution to TB care: an Asian Perspective, WHO report. WHO/CDS/TB/2002.302*

Table-5: Summary of potential for community involvement in TB control

Purpose of community involvement	Type of community involvement	Activity
Raising community awareness of TB and TB treatment	Formal/ Informal	Delivery of messages to promote knowledge of TB symptoms and need for treatment completion
Case detection and referral for diagnosis	Formal	CHW surveillance
Providing access to drugs	Formal	CHW's as providers of TB drugs
Addressing stigma: direct approach	Formal/ Informal	Disseminating information through home care volunteers or through communication and discussion groups
Addressing stigma: indirect approach	Formal	Integrating community-based TB control programs with non-stigmatized health care programs or primary health care
Raising awareness to encourage compliance	Formal/ Informal	Disseminating information and encouraging compliance
General support	Formal/ Informal	Family support, peer groups and community volunteers to support patients throughout treatment
Direct observation of treatment	Formal/ Informal	CHW, family member or other community member to observe patients taking medication
Recognition of adverse effects and tracing of patients who interrupt treatment	Formal	CHW to recognize and refer patients with adverse drug reactions Community volunteers to keep in contact with patients over the entire treatment period
Ongoing care and support	Formal/ Informal	Community volunteers or staff
Documentation of progress and outcome	Formal/ Informal	Formation of CHW associations, use manuals and the contribution of school children or family members to read instructions

***Source:** Hadley M. Maher D. Community involvement in TB control: lessons from other health care programs. International Journal of TB and Lung Disease 2000; 4: 401-408.*

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List of acronyms

BRAC	Bngladesh Rural Advancement Committee
CHW	Community Health Worker
DOTS	Directly Observed Treatment, Short-course
DST	Drug Sensitivity Testing
EQA	External Quality Assessment
ESP	Essential Service Packages
HPSP	Health and Population Sector Programs
MIS	Management Information System
MoH&FW	Ministry of Health and Family Welfare
MoUs	Memorandum of Understandings
NGO	Non Government Organization
NTP	National Tuberculosis Control Program
RNTCP	Revised National Tuberculosis Control Program
SEWA	Self Employed Women Association
SWAP	Sector-wise approach
TB	Tuberculosis
TBC	Tuberculosis Control
THCs	Thana Health Complexes
WHO	World Health Organization