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# NEWSLETTER

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# Controlling a forgotten disease. Using voluntary health workers for tuberculosis control in rural Bangladesh

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## Introduction

In Bangladesh, the National Tuberculosis Programme has not been successful, particularly in rural areas. Following a survey in the Manikganj sub-district of rural Bangladesh, BRAC, a non-governmental organisation (NGO) began a community based tuberculosis control programme using voluntary health workers (VHW). The experience gained in this programme over the past five years is summarized here.

## The magnitude of the problem

A radiological survey carried out in Bangladesh in 1964-65 found 3.2 million cases of pulmonary tuberculosis (4% of the population) (Islam, 1981). It was estimated that 390,000 of these cases (or 0.5% of the population) were sputum positive.

A recent national survey conducted in Bangladesh found 0.87% sputum positive cases in the population 15 years old and over (Director General, Health Services, 1989) (Table 1). Men were affected twice as often as women and the problem was more acute in urban areas.

Table 1. Tuberculosis in adults as determined by the National Prevalence Survey on Tuberculosis in Bangladesh (1987-88)

Age group surveyed	15 years and over	
% sputum positive	Total	0.87
	Male	1.08
	Female	0.60
	Rural	0.80
	Urban	1.61

Source: DGHS 1989

In a survey carried out in 50 villages of Manikganj district in 1984, twenty percent of the population aged 15 years or over had a history of chronic cough. Sputum from these patients was collected and examined. Of 850 sputa, 2.7% were AFB (acid fast bacilli) positive and out of those cultured, 3.1% showed the growth of *M. tuberculosis*. Sixty three percent of smear-positive cases were also culture positive. Smear-positive rates in the community were estimated to be 0.33% to 0.55% and culture positive rates were 0.39% to 0.64%. Drug sensitivity tests indicated that 70% of the strains were sensitive to all 12 antituberculosis drugs and the remainder were resistant to one or two combinations of streptomycin, INH, thiacetazone and ethionamide (Islam *et al*, 1986).

## Control programmes in Bangladesh

There are essentially three types of tuberculosis control programmes in Bangladesh (Ishikawa, 1985):

- Type A. Hospital or clinic based programmes that have no or insignificant links with the community (government programmes);
- Type B. Hospital or clinic based programmes that have strong links with community health workers (most programmes run by non-governmental organisations (NGOs);
- Type C. Totally community based programmes with no hospital or clinic where village health workers are the "nucleus" (the BRAC programme described later in this paper).

There is also a large private health sector and most anti-tuberculosis drugs can be purchased over the counter from pharmacies. Most of these drugs are produced in Bangladesh.

## The National Control Programme

The preventive approach to tuberculosis through BCG vaccination improved

from a less than 2% coverage by early 1980's, to a now approaching 80% coverage for the population under one year of age.

The Bangladesh national treatment programme is clinic-based. There are 57 hospitals and clinics (with 1,076 beds) all in urban areas where tuberculosis patients are given care. If the estimated number of active tuberculosis patients is correct, there are 0.0019 beds available for each case.

It has been estimated that only 25% of the patients turning to these facilities complete their treatment. The participation and contribution of the 460 upazila (sub-district) level Health Complexes in the tuberculosis control programme is considered to be insignificant (Islam, 1987). In the 124 upazilas (pop. 2.5 million) on which information was available, only 560 smear-positive cases were identified in 1987 (Government of Bangladesh, 1988).

Although the integration of tuberculosis control in the health services has been an accepted policy of the government since 1976, little progress has been made in this regard, unlike other priority programmes, such as malaria and immunisation. There are a number of government health workers posted in the community (approximately 15 per 20,000 population), yet none of them is involved in any activity directly related to tuberculosis control except for BCG given in the EPI programme (BRAC, 1990).

The health staff is not sufficiently trained in tuberculosis control; supervision of patients for compliance in hospitals and especially at the community level is lacking.

Finally, as elsewhere in developing countries, tuberculosis control is politically a low priority programme; this is reinforced by insufficient donor interest, with as a consequence a constant dearth in the supply of drugs.

There have been limited efforts (through mass media, for example) to

create public awareness about the dangers of tuberculosis. Community based observations have found tuberculosis is quite dreaded by the villagers (Chowdhury *et al*, 1998), but no effort has been made to use this concern for motivating the population to recognise symptoms, seek medicare and complete treatment. The National Antituberculosis Association of Bangladesh (NATAB) undertakes occasional drives to sell "TB seals".

Some NGOs have undertaken small scale programmes, which are unhappily unable to make any impact on the global control of tuberculosis in Bangladesh.

As a whole, in spite of those efforts, there has not been any decrease in the prevalence of tuberculosis over the past 25 years and not even a significant decrease in the risk of infection.

### The Control Programme in Manikganj

#### The setting

Since 1976, BRAC has been running an integrated development project in Manikganj, a sub-district situated 65 kilometres west of Dhaka city. Programmes on functional education for adults and children, health, income generation, credit and women's development have been carried out in 235 villages with a total population of about 220,000. The cornerstone of these BRAC programmes is the organisation and development of landless and near-landless (owning less than 0.5 acre) groups of male and female villagers into pre-cooperatives to undertake collective activities in different fields. In most female and in some male groups, a member has been trained by BRAC doctors and paramedics to become a village health worker ("shastha shebika"). Patients with common illnesses are treated for a small fee. The shebika also sells medicines which he/she receives from BRAC at cost and participates in preventive health care activities such as immunisation and health education.

The shebikas are mostly female, with an average age of 35, illiterate and belong to the poorest section of the community (BRAC, 1987).

#### The Manikganj Tuberculosis Control Programme

Following the 1984 survey, BRAC decided to test a community based tuberculosis control programme in Manikganj with the trained shebikas as the nucleus.

In the villages, BRAC workers and shebikas, through their regular meetings with the villagers, emphasised the dangers of tuberculosis and the need and feasibility of a simple curative treatment. In such meetings they asked the villagers to identify those who had had chronic cough for at least four weeks. The identified cases were asked to give early morning sputum in a container supplied by the shebikas. Many people did, in fact, present themselves to shebikas to give a sputum. The sputa were then taken to one of the 5 sub-centres where they were registered and smeared, to be transported to the central laboratory in Manikganj town for staining and microscopic examination. Examinations were done within a week by trained technicians. Most negative cases were followed up for two more weeks and sputum tested once every week. Cases showing positive sputum were immediately brought under treatment.

The target patients were contacted, told about the results, and asked to register to receive a 12-month free treatment course. Patients refusing to participate were motivated through other family members and influential people in the village.

Patients willing to participate were asked to deposit Taka 100 (US\$ 3.00), equivalent to three days' of wages, and more recently Taka 150, as a guarantee to complete the treatment course, and to sign a deed to this effect in the presence of other villagers and family members. Upon successful completion of the course, the patient received Taka 75 back and Taka 25 was given to the shebika for her service over the year. Patients too poor to pay the deposit received a waiver but family members and other influential villagers were required to provide a guarantee that he/she would not default. In some cases, the group to which the patient belonged paid it for him/her.

The treatment began with a streptomycin course of 30 injections every other day for two months, accompanied by INH (300 mg) and thiacetazone (150 mg) ("Diateben") once daily for 12 months. In case of adverse reactions to the latter drug, two ethambutol (400 mg) tablets and three isoniazid (100 mg) tablets were given daily. The injections were given by the shebika, who also provided the drugs for one to two weeks; before replenishing the supply she made sure that the drugs previously given were consumed.

During treatment, the sputum was again tested at least at 6 and 12 months. Patients with complications or sputum positive after 12 months were referred to specialised clinics or hospitals in Dhaka.

A Review in 1989 showed that the shebikas did not seem highly motivated to collect sputum from those with chronic cough: shebikas now receive Taka 50 as incentive for each positive case identified.

Due to a lack of supervision, the programme responsibility has now been vested with one single person who has been given a motorbike, which makes it easier to oversee the programme.

#### Collaboration with others

This programme was run by BRAC in collaboration with the National Tuberculosis Control Project (NTCP) and the National Antituberculosis Association of Bangladesh (NATAB). Medicines were provided free to BRAC by NTCP (and occasionally by NATAB) which also provided the microscope and reagents. Staff members from NTCP and NATAB periodically visited the programme to monitor progress.

The government district hospital referred suspected cases to BRAC.

In an effort to integrate this programme into the government health system, the drug supply and laboratory services for sputum examinations were absorbed into the district hospital in 1987. It did not work out well, as the doctors in the hospital could not understand the concept of a community based programme and insisted that the diagnosis and medication be done only by qualified doctors using X-rays. As a result the programme was later brought back to BRAC.

#### Results

A total of 2,932 sputa were collected (1,715 in 1984-88 and 1,217 in 1989). Out of these, 280 (9.5%) were found AFB positive; eighty percent of these positive cases were males.

Treatment was started in 264 (94.3%) of the identified cases. Table 2 gives the data separately for two periods (1984-88 and 1989), and shows a notable increase in the number of sputa collected in 1989 compared to 1984-88, after introduction of the incentives for the shebikas.

The results of the treatment programme for the period 1984-88 are the following: 66.3% of the patients completed the treatment course, and 8% dropped

## PRINCIPAL ARTICLE

Table 2. Cases identified and treated in the Tuberculosis Control Project of BRAC in Manikganj, Bangladesh

Information	Programme period		
	1984-88	1989	1984-89
Sputum collected	1175	217	2932
AFB positive	202	78	280
Death before treatment	10	1	11
Treatment not given/refused	5	0	5
Treatment started	187	77	264
Treatment completed	124	9	133
Treatment continuing		49	49

out. The remaining either died (12.8%), migrated out (2.7%) or were referred to hospitals or clinics (10.2%). There was no significant difference between males and females in terms of treatment compliance. Patients completing the treatment were younger than those who died or discontinued therapy. If we however exclude half of those who were identified, but could not participate fully in the treatment programme (death, migration, referral) the adjusted treatment completion rate is 79% and the dropout rate is 9%.

A major reason for dropout were the side-effects (painful infection and vertigo). In addition to seasonal migrations, some patients from neighbouring upazilas, who took advantage of the BRAC programme with the help of their relatives living in this upazila, discontinued treatment when they needed to return to their homes.

A recent follow-up found that nearly half of the fatalities died within one month of the start of the treatment and that a majority of them had undertaken other treatments before. As determined by history, tuberculosis was felt to be a cause of death in over 70%.

### Relapse cases

Out of 124 patients who completed the treatment earlier, 95 were traced in March-April 1990 and their sputum was re-examined. Ten percent were found to be positive. A close examination of these

cases revealed that most of them had had irregular treatment before starting the BRAC treatment and may have been resistant to the drugs. A new treatment regimen including rifampicin will be used for this group.

Table 3. Estimated costs of the BRAC Tuberculosis Programme (1984-88)

Expenditure category	Percent expenditure
Reagents/slides	4.5
Stationeries	1.1
Sputum container	0.5
Microscope	4.5
Rent for laboratory room	2.6
Fixture/furniture	1.6
Staff time	30.4
Transportation	1.7
NATAB supervision	16.9
Sheliks (including training)	2.9
Medicines	33.3
Total	100.0
	In Taka 443,910
	In US\$ 12,680

### Programme costs

Estimates of the amount of money spent in the programme (direct and indirect) through 1988 are given in Table 3. A total of Taka 443,910 was spent which means that Taka 3,580 or US\$ 102 was spent per treatment-completed case. The expenses per completed treatment appear even lower (esp. 3,000 Taka or US\$ 86) if one considers that half of the deaths, migrated and referrals have completed their treatment.

Actual expenditure by BRAC for this programme is smaller since the microscope, reagents and medicines were supplied by the government and/or NATAB.

### Discussion

In a situation where the state tuberculosis programme is largely not functioning adequately or is inappropriately designed, experimentation with alternative modes of service is essential, like the BRAC programme based in the rural community where 80% of the people live. The results available so far are encouraging. Of the positive cases identified, an estimated 79% completed the full treatment schedule and the dropout rate was only 9%.

Another NGO programme based around a hospital in a rural area of Bangladesh did start a similar "deposit" scheme and its outcome is also encouraging (Nabi *et al.*, 1985, Parker, 1986).

The cost of the programme described here was estimated to be US\$ 86 per estimated treatment completed case. With better case identification and increased BRAC supervision, the modified programme is expected to be even more cost-effective.

The programme strategy described in this paper has shown a definite promise towards community based tuberculosis control. BRAC has already planned to extend its action to 20 more sub-districts with a population of over 4 million.

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(See grants and gifts received in 1991, page 10)

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