# Success with the DOTS strategy

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BRAC has been implementing a tuberculosis programme in Bangladesh with directly observed therapy since 1984,[1] well before the World Health Organization announced a "breakthrough" in tuberculosis control in 1997 through the directly observed therapy short-course (DOTS) strategy.[2] For the first decade of operation, the BRAC programme relied on a 12-month treatment regimen, but from 1995 an 8-month short-course regimen was introduced.[3] Since the start of short-course treatment, a consistent and satisfactory cure rate has been reported. The table shows the trend in outcome of treatment for cohorts of smear-positive new cases.

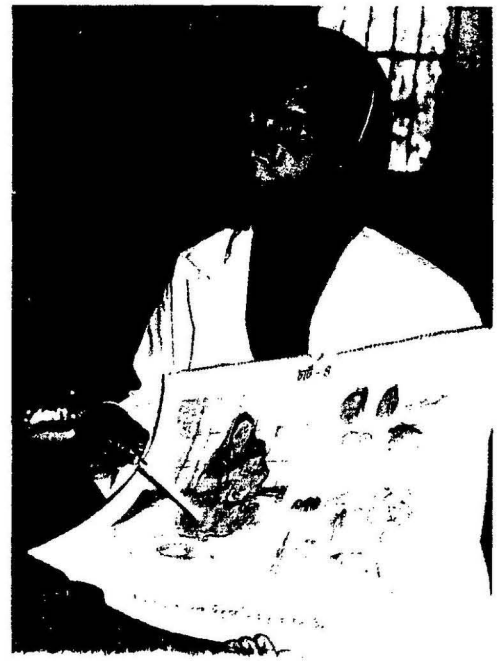
| Outcome | Number of new cases | | | |
|---|---|---|---|---|
| | 1992–94 (n=3497) | 1995 (n=1525) | 1996 (n=2729) | 1997 up to June (n=1628) |
| Cured | 2833 (81·0)* | 1301 (85·3) | 2312 (85·0) | 1463 (90·0) |
| Completed | .. | 1 (0·06) | 6 (0·2) | 0 |
| Died | 336 (9·6) | 126 (8·3) | 233 (8·5) | 99 (6·0) |
| Failure | 51 (1·5) | 43 (2·8) | 52 (1·9) | 22 (1·3) |
| Defaulted | 109 (3·1) | 36 (2·4) | 55 (2·0) | 28 (1·7) |
| Migrated/deferred/ transferred | 168 (4·8) | 18 (1·2) | 71 (2·6) | 16 (1·0) |

Figures within parentheses indicate percentages. *Includes cured and completed cases.

**Treatment outcome (1992–97)**

BRAC is a local non-governmental organisation (NGO) with 22 000 full-time and 35 000 part-time staff. It works in over 50 000 villages, and implements programmes on poverty alleviation through micro-financing, non-formal primary education, women's health measures, and disease control.[4]

The tuberculosis-control programme, which is implemented in collaboration with the government of Bangladesh, has gradually scaled up from one thana (sub-district; population 225 000) in 1984 to 60 thanas in 1998. At the core of the programme is the community health worker (CHW) who is a member of the local village organisation and supported by BRAC through micro-financing and other development inputs. CHWs are all women, mostly unschooled, who receive training from BRAC on the treatment of common illnesses including tuberculosis (figure). The CHW identifies people with chronic cough and sends samples of sputa to a local BRAC laboratory for microscopy. The acid-fast-bacilli-positive cases are brought to treatment immediately. The CHW provides the drugs, received free from the government. During the initial 2 months after identification, the patients come to the CHW's home daily for drugs. For the remaining period of treatment, the patients are given a week's supply at a time. Before the CHWs initiate the treatment, the patient has to pay 200 taka (US$5) and sign a bond that she or he will complete the treatment; in case of default, the bond money is forfeited.



**A CHW explaining child nutrition with the help of a flip chart**

The factors responsible for success include the learning culture of the BRAC organisation, involvement of CHWs, the bond money requirement, programme out-reach, provision of free drugs, good management, and availability of technical and financial resources.[5]

Consistent cure rates of around 85% are testimony to the effectiveness of the BRAC programme and the DOTS approach. However, blanket application of this strategy without taking into consideration the facilitating factors may yield disappointing results. An important feature of the DOTS strategy is the use of "patient observers".[3] In the BRAC programme, the CHW assumes this role. Because the CHW comes from the village in which she works, comfort, familiarity, and interaction with patients is ensured. The government, which has a health worker for every four to five villages, cannot attain the same degree of community confidence and involvement since their health workers are not always accessible to patients. Although bond money does influence treatment behaviour, more influential is the bond created between the patient and CHW.

The question is how in a government system where community participation is not a priority can success in DOTS be achieved? To facilitate the process of involving the community BRAC is now working with the government in 11 thanas where the government provides drugs, microscopy, and supervision while BRAC does case finding and holding through CHWs. NGOs, being close to the grassroots, are better placed to obtain and sustain community involvement.

*Lancet* 1999; **353:** 1003–04

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A second issue raised by the Bangladesh experience is the need to demystify tuberculosis treatment. The success of the CHW approach challenges the myth that physicians are essential at all stages of tuberculosis treatment. Trained local women with good supervision can accomplish seeming miracles in the villages of developing countries. The more that tuberculosis treatment is brought outside hospital walls and the control of experts the greater the success of DOTS; the example of oral rehydration therapy in many developing countries including Bangladesh bears testimony to this.[6]

The third issue of concern is gender. In the BRAC programme, only about a third of tuberculosis patients are women. Although BRAC programmes are women-focused, the social and cultural factors that prevent a woman with tuberculosis from contacting another woman next door for treatment are a matter of grave concern. These stigmatising factors, which are probably more deep-rooted than previously thought, need to be identified for future efforts towards tuberculosis eradication.[7]


**References**

1 Chowdhury AMR, Ishikawa N, Alam A, et al. Controlling a forgotten disease: using voluntary health workers for tuberculosis control in rural Bangladesh. *IUATLD Newsletter* 1991; 1-4.

2 WHO press release. Breakthrough in TB control announced by World Health Organization. Geneva: WHO, 1997.

3 Chowdhury AMR, Chowdhury SA, Islam MN, et al. Control of tuberculosis by community health workers in Bangladesh. *Lancet* 1997; **350:** 169–72.

4 Lovell CH. Breaking the cycle of poverty. Hartford: Kumarian Press, 1992.

5 Chowdhury AMR, Vaughan JP, Chowdhury SA, Abed FH. Demystifying the control of tuberculosis in rural Bangladesh. In: Porter J, Grange J, editors. Tuberculosis—an interdisciplinary perspective. London, Imperial College Press (in press).

6 Chowdhury AMR, Cash RA. A simple solution: teaching mothers to treat diarrhoea at home in Bangladesh. Dhaka: University Press Ltd, 1996.

7 Grange JM, Zumla A. Making DOTS succeed. *Lancet* 1997; **350:**158.


# Post DOTS, post genomics: the next century of tuberculosis control

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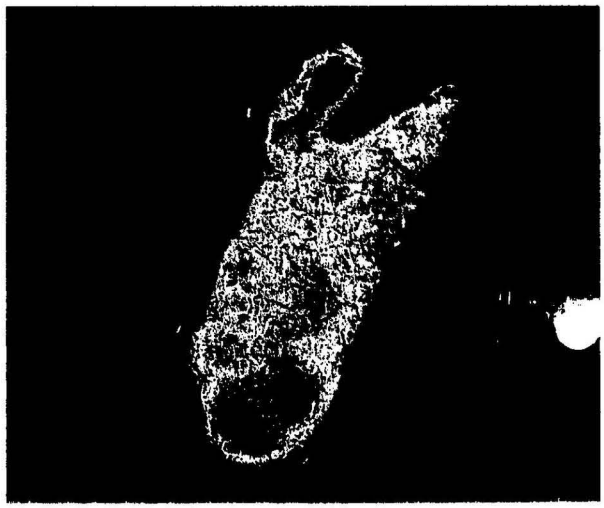
At the end of another decade of our fluctuating relationship with tuberculosis, it is not clear whether we should be optimistic or pessimistic. The raw statistics are bad: an estimated 30 million people have died of tuberculosis in the past 10 years.[1] The WHO has rightfully declared this to be a global health emergency. Almost in the same breath, it was announced that a solution to this global disaster had been discovered, the widespread implementation of directly observed therapy short-course (DOTS), a set of measures (essentially 6 months of intermittent supervised therapy) that have existed for over 2 decades.[2] Although this renewed commitment to fight tuberculosis is a welcome change after years of neglect, DOTS alone will struggle to control tuberculosis.

Despite some notable successes,[3] DOTS implementation has been slower than anticipated reaching only 12% of tuberculosis cases worldwide by the end of 1996.[4] Recent projections suggest that even if this rate of implementation were substantially increased, tuberculosis mortality will not be halved before 2030.[5] Evidence is also emerging that DOTS is unable to control tuberculosis in countries with high levels of HIV infection,[6] and in other countries it is failing to achieve adequate cure rates.[7] An estimated one third of the world's population are latently infected with tuberculosis, 10% of whom (in the absence of HIV co-infection) will develop tuberculosis. This vast reservoir of potential cases—an unknown proportion infected with potentially untreatable multidrug-resistant tuberculosis—means a DOTS programme would have to be sustained for decades even after full coverage is achieved, a daunting task given the fragility of national tuberculosis programmes and the history of tuberculosis control.



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***Mycobacterium tuberculosis* bacillus (colour transmission electron micrograph ×44 000**

The way is now open for assessing the 4000 genes in the organism's genome for their potential as subunit vaccines.

With the exception of molecular diagnostics and epidemiology, the basic sciences have contributed little to tuberculosis control since the advent of rifampicin 30 years ago. But, by contrast with therapeutics, mycobacterial research has developed considerably over the last decade. Central to this renaissance has been the development of efficient systems for genetically manipulating mycobacteria[8] and the sequencing of the *Mycobacterium tuberculosis*

*Lancet* 1999; **353:** 1004–05

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