

## Whence decentralised TB treatment and whither TB control in Malawi?

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**Early efforts to control tuberculosis (TB) only became effective with scientific understanding of the disease and evaluation of the action of effective anti-TB drugs. The principle of centralising initial treatment in hospitals has been challenged by the TB/HIV dual epidemic, which has weakened health services and increased the caseload. Between 1997 and 1998 the National TB Control Programme (NTP) in Malawi conducted decentralisation studies in 5 districts on various forms of directly observed treatment (DOT) options for the initial intensive phase of TB treatment. The results were sufficiently encouraging to expand the scheme countrywide. But strengthening NTP management capacity is a priority.**

### Introduction

The principles of tuberculosis (TB) control are based on scientific grounds. For many years the battle against TB has either been decentralised or centralised. To understand the rationale behind the choice of care in a particular place and time one needs to understand the scientific knowledge and the prevailing conditions within which such decisions were made. With the recent resurgence of TB as a public health problem, especially in sub-Saharan Africa, where the human immunodeficiency virus (HIV) infection has fuelled the TB epidemic,<sup>1</sup> health services have been stripped of the capacity to cope and provide a quality service. In Malawi, one of the countries badly hit by the HIV epidemic, the National TB Control Programme (NTP) is decentralising TB treatment in the initial phase of treatment, aiming to maintain delivery of quality treatment and care to TB patients. From 1 November 2000 all districts in the northern and central regions of the country, except Karonga district, started the new decentralised approach which will cover the whole country in 2001. In this paper, which is the product of literature review, we examine models of centralised and decentralised TB care that have been used since TB has become recognised as a public health problem. We look at the origins of our modern practice, and at the implications of implementing decentralisation in our setting.

### The old TB epidemic

Tuberculosis is known to have existed as early as 3700 BC.<sup>2</sup> Data suggest mortality was highest between 17th and 18th centuries especially in America, Western Europe and later in Eastern Europe. At the turn of the 19th century mortality in London was around 600 deaths from tuberculosis per 100 000 general population.<sup>3</sup> Transmission through the air was understood as early as 1862 through experiments conducted by Pasteur<sup>2</sup>, and Robert Koch discovered *Mycobacterium tuberculosis* as the cause of TB in 1882.

### Community and Centralised TB care during the old epidemic.

Early attempts to contain TB with treatment of patients have been documented.<sup>4</sup> Types of care can be regarded as an earlier version of decentralised TB treatment, with e.g. *boa constrictor* excreta, arsenic or gold for the wealthy, while lard, cod liver oil or the smell of cow dung had to suffice for the poor. Before antimicrobial therapy, centralised TB care came in institutions called 'sanatoria', which were similar to modern hospital TB wards. These were built in rural areas at high elevations to give dry climate and fresh air, bed rest, good nutrition, mental tranquility and optimism, all thought to be beneficial. Various surgical procedures like artificial pneumothorax, thoracoplasty and phrenic nerve crush were also available centrally.

### Comparisons of centralised and decentralised TB treatment in the old epidemic

The discovery of effective anti-microbial agents, initially *streptomycin*, *isoniazid* and *para-aminosalicylic acid* (PAS) revolutionised TB treatment in the early 1950s, but these were at first grafted on to centralised hospital care. Increased TB cases in some parts of the world where health services were weak, as in India, raised concern as resistance to drugs due to improper usage started to emerge.<sup>5</sup> In India increased caseload coincided with inadequate hospital TB beds in the country. In 1955, at the request of the Indian government, WHO sponsored members of the Medical Research Council of the United Kingdom to advise on studies designed to provide information on efficacy of treatment at home compared with treatment in a sanatorium, including a study of the risks to which treatment of patients at home might expose their contacts.<sup>6</sup> The studies showed no difference in cure between the two groups of patients and no difference in active TB between the close family contacts of the groups. This was the first evidence that decentralisation using effective anti-TB treatment is beneficial to the health service, patients and their families. The approach was not widely adopted, probably because TB cases continued to decline world-wide.

### The new TB epidemic

In the 1980s a TB epidemic re-surfaced, resulting from increased poverty, increased overcrowding, refugee crises, relaxed vigilance by countries in TB control and, overwhelmingly, the impact of HIV/AIDS.<sup>7</sup> In sub-Saharan Africa the HIV epidemic had the greatest impact on TB caseloads. For example in Malawi and Tanzania cases increased 190% and 290% respectively between 1984 and 1994.<sup>8</sup> In 1993 the World Health Organisation (WHO) declared TB a global emergency. WHO and the International Union against TB and Lung Disease (IUATLD) recommended treatment of tuberculosis using the "DOTS" (Directly Observed Treatment - Short Course) strategy which has five components:

- 1) government commitment
- 2) diagnosis of cases through sputum smear microscopy

- 3) an uninterrupted anti-TB drugs supply
- 4) treatment of infectious cases with short course treatment
- 5) programme monitoring and evaluation.

*Directly Observed Treatment (DOT)* is the supervising of patients' treatment to enhance compliance through the course of treatment. The need for decentralising TB treatment in the African region became apparent as the caseload continued to rise and cripple health services in delivering effective treatment. Between the late 1980s and early 1990s several studies in Africa piloted decentralising TB treatment by using non-health workers to do DOT. Most of these studies showed decentralised treatment was beneficial to the health service, the patients and their families.<sup>9, 10, 11, 12</sup>

**Malawi's TB epidemic**

The TB Control Programme was started in 1964 in Malawi.<sup>13</sup> Since the programme opened a register of TB cases in 1969 sharp increases in TB caseload were not experienced until the mid-1980s. In 1985 there were 5,334 registered cases and in 1995 this had risen to 19,155. The dramatic rise of TB cases in Malawi reflects the impact of the HIV/AIDS epidemic, as several studies have shown a strong association between HIV and TB in the country.<sup>14, 15, 16</sup> The national HIV seroprevalence rate among TB patients in 1994 was 65% and this rose to 77% in the year 2000 (Source: National TB Control Programme).

**Table 1. Old remedies for tuberculosis before 19th century**

<i>Rich patients</i>	<i>Poor patients</i>	<i>For all patients</i>
Boa constrictor excreta	Lard	Dry climate*
Aluminium	Cod liver oil	Clean open air spaces*
Arsenic	Smell of cow dung	
Digitalis		
Gold		
Opium		

\*It was because of this belief that John Cecil Rhodes was sent on visits to South Africa

**Centralised TB care in Malawi**

The Table describes the management of TB cases in Malawi up to the year 2000. Increased caseload hampered the health staff giving proper DOT, posed a danger of HIV cross infection as streptomycin injections were used in the drug regimen and probably deterred patients with TB symptoms, resulting in delay in seeking diagnosis and thereby continued spread of infection in the community. In urban districts this policy was modified in 1995 where smear negative pulmonary TB patients took drugs unsupervised from first day of treatment. With increasing caseloads, even this changed policy became difficult to implement: in 1997 bed occupancy rates in the TB wards of the government hospital of Lilongwe district ranged from 120 to 160%.

**Operational research in Malawi**

The NTP conducted several studies of decentralising TB treatment by involving the community in order to deliver proper DOT. The studies were done in Ntcheu between 1996 and 1997 and in Lilongwe, Ntcheu, Zomba, Machinga and Salima between 1997 and 1998.

**Table 2. A list of surgical procedures used to treat TB patients in the 17th and 18th century**

<i>Pneumothorax</i>	<i>Pneumolysis</i>
Pneumoperitoneum	
Extrapleural pneumothorax and plombage	Thoracoplasty
Subcostal extraperiosteal plombage	pulmonary resection

The Table provides the community DOT options that were piloted in Malawian studies. These studies have shown that decentralising TB treatment in Malawi produces good treatment outcomes, reduces expenditure by the health service, by the patient and by the family, and is cost-effective (Source: NTP, Malawi). As a result the NTP is expanding community TB care countrywide in phases. Central and Southern regions of Malawi started community TB care on 1 November 2000 and this will be implemented in the Southern region by June 2001. Detailed analyses of the published and unpublished studies that have prompted the NTP in Malawi to introduce new decentralisation policy can be obtained from the corresponding author upon request.

**Emerging operational issues**

The NTP in Malawi has learned that for decentralisation to work the following are required:

- 1) good health centre supervision
- 2) good drug distribution
- 3) good record keeping by health staff
- 4) good patient education
- 5) good collaboration between the health service and community structures providing health care.

Since decentralisation started in Malawi on 1 November 2000 the NTP has already come across some challenges. These are picked up during NTP supervision in the districts that have implemented the new approach. They include:

- 1) lack of proper recording by District TB Officers (DTO) of where patients have initial phase DOT
- 2) lack of health education to patients
- 3) lack of regular ward rounds on TB wards
- 4) lack of collaboration between DTO and District AIDS Co-ordinators (DAC).

The last point is important because of the strong association between TB and HIV. DAC are better placed as far as district home based care is concerned. Earlier assessment has indicated the potential of HIV/AIDS community care organisations to function additionally as a mechanism for increased community participation in TB care.<sup>18</sup> However the stigma of the association between TB and HIV raises concern about care from such organisations. Community involvement in TB care has a potential of improving case finding as has been the experience in other places.<sup>19</sup> The NTP in Malawi needs to study this further.

## CONCLUSION

In this paper we have reviewed the history and application of both centralised and decentralised treatments and how these have influenced current practice in Malawi. Although mortality due to TB dropped in the 1900s, there is no evidence that this was due to either decentralised or centralised TB treatment. Instead, improved living standards are thought to have played a major role.<sup>2</sup> The value of treatment changed when potent anti-tuberculosis drugs were discovered and proper studies were conducted. Malawi has learnt from some of these examples and has gone an extra step by generating evidence based policy changes in the country through operational research on best ways to manage the 'new TB epidemic'. The NTP in Malawi has a good drug distribution system, but needs to strengthen its supervision at all levels to improve health education delivery to patients and recording by TB officers District Health

Management Teams need to be reminded about the importance of regular ward rounds as a many TB patients may have HIV complications. The DTO and DAC need to liaise in provision of care to TB patients. The links between the health service and the community care organisations need to be strengthened and supervision of such groups is the responsibility of health staff. Admission of patients during the first two weeks of treatment (see Table) may not benefit a few

**TABLE. The old (centralised) and the new (decentralised) TB treatment in Malawi.**

Type of care	In centralised care	In decentralised care
* Patients' drug regimens:	2SRHZ/6EH	2R,H,Z,E <sub>s</sub> /6EH
* For new smear positive PTB / New serious EPTB(1)	(2) 1SEH/11HE	(2) 2R,H,Z <sub>s</sub> /6EH
* New smear negative PTB / New less serious EPTB(2)	(3) 2SRHZE/1RHZE/ SR,H,E	(3) 2SRHZE/1RHZE/ SR,H,Z,E <sub>s</sub>
Re-treatment cases (3)		
Hospitalisation:	Initial phase of treatment (1, 2 or 3 months according to type of TB)	* In urban districts, no compulsory admission * In rural districts, compulsory admission for first two weeks only
Community DOT options:	None available	Patient chooses DOT options available i.e. hospital admission, hospital OPD, health centre, guardian or community health volunteer
Patient follow-up:	Smear positive PTB patients only	All patients

economically vulnerable individuals who can not afford time for hospital admission. The NTP needs to study how this will affect case finding and treatment of patients. The NTP faces some problems in decentralising TB treatment in Malawi. Improved supervision and patients' TB/HIV care may require sustained donor assistance while improved records and collaboration with other health care givers require good programme organisation.

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