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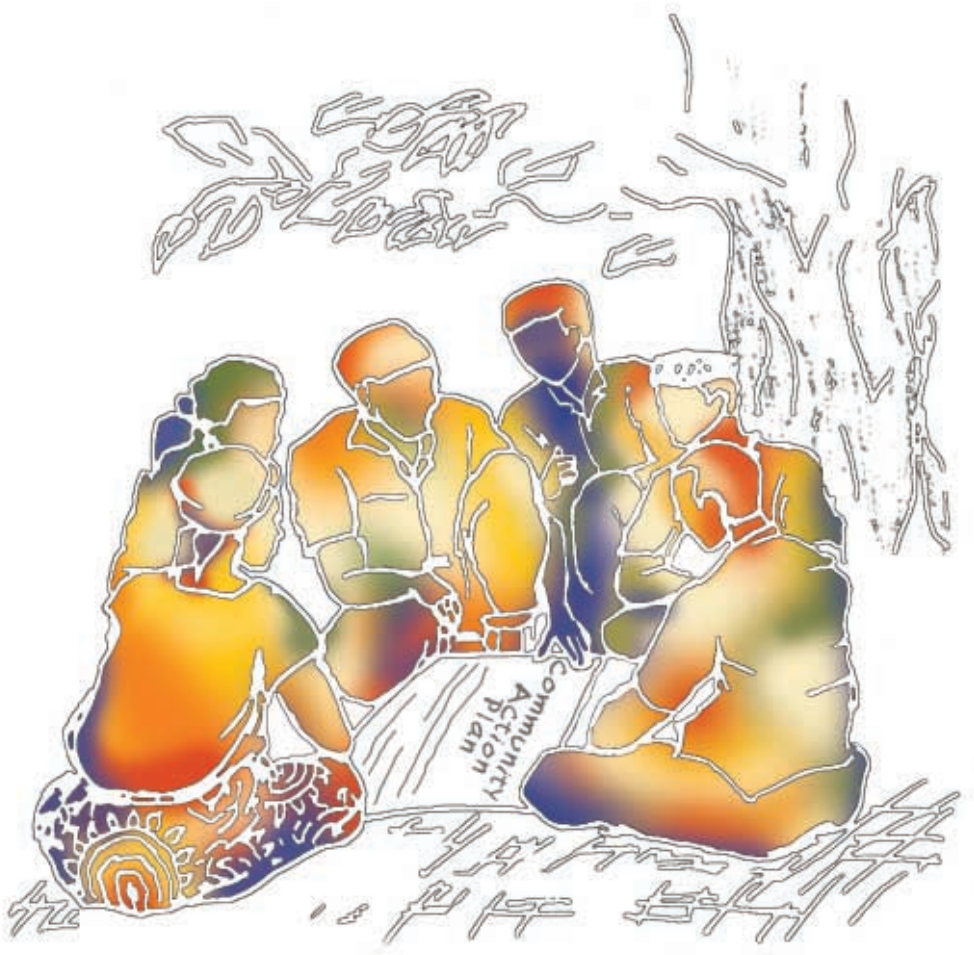
COMMUNITY CONTRIBUTION TO TB CARE:

PRACTICE AND POLICY



WORLD HEALTH ORGANIZATION
GENEVA

WHO/CDS/TB/2003.312

COMMUNITY CONTRIBUTION TO TB CARE: PRACTICE AND POLICY

REVIEW OF EXPERIENCE OF COMMUNITY CONTRIBUTION TO TB CARE AND RECOMMENDATIONS TO NATIONAL TB PROGRAMMES

STOP TB DEPARTMENT - WORLD HEALTH ORGANIZATION - GENEVA

Writing committee
D Maher (WHO/HQ), K Floyd (WHO/HQ), BV Sharma (University of Hyderabad, India), E Jaramillo (WHO/HQ), W Nkhoma (WHO/AFRO), E Nyarko (WHO/AFRO), D Wilkinson (University of Adelaide, Australia), M Raviglione (WHO/HQ)

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PREFACE

Although National TB Programmes (NTPs) in most countries have often concentrated on promoting access to effective TB care through government health facilities, many NTPs are now increasingly promoting access to effective TB care through other health service providers, including the community. The need to promote community contribution to TB care as part of NTP activities is particularly urgent in sub-Saharan Africa, where the human immunodeficiency virus (HIV) is fuelling the TB epidemic, and increasing TB cases are outstripping the ability of government health service providers to cope. With reliance often only on government health service providers, very few NTPs in high HIV prevalence countries are achieving adequate TB case detection rates and treatment outcomes.

On account of the sparse published experience of community contribution to TB care in countries badly affected by TB/HIV, WHO initiated the coordination of the "Community TB Care in Africa" project in 1996. Investigators from this project met in Zimbabwe in 2000 to share results and to make policy recommendations. The main focus of WHO's efforts in evaluating and promoting community contribution to TB care has been on sub-Saharan Africa, the region most badly affected by HIV. However, WHO has also commissioned reviews of community contribution to TB care in other regions, namely Asia and Latin America. This document brings together several sources of information on experiences of community contribution to TB care. These comprise reviews of the relevant published experience, the results from the "Community TB Care in Africa" project and the reviews from Asia and Latin America. The policy guidelines in this document reflect these experiences from different sources. In the annexes we include two practical guides. Firstly, a detailed practical "how to" guide (based on the approach developed in Uganda) for conducting, reviewing and then implementing the DOTS strategy at district level, incorporating the community contribution to TB care as part of district NTP activities. Secondly, a guide for TB treatment supporters.

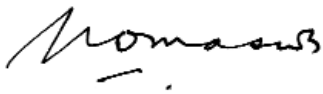
The purpose of this document is to give the background to policy recommendations for NTPs and community groups to collaborate effectively in improving the delivery of TB care. WHO will revise the document in future as NTPs in these and other regions gain further experience of community contribution to their activities. The target audience for this document includes NTPs, health workers at all levels, communities, and community groups or organizations.

FOREWORD

The scale of the global TB epidemic requires urgent and effective action. This is particularly true in those parts of the world where HIV is fuelling TB. One of the challenges facing health systems is to bring the provision of health services as close as possible to those who need them. TB is both a disease of poverty and a disease exacerbating poverty. With the necessary support, communities have the potential to contribute to TB care. This can therefore help ensure access to TB care of the poor, who most need it, and help alleviate the impoverishing effects of TB.

This document brings together experience in community contribution to TB care from several regions, and the resulting policy recommendations. Among the experience documented is that of the "Community TB care in Africa" project. We can take pride in the Africa region in the leadership we have shown in undertaking this project and demonstrating the success of community contribution to TB care. Having demonstrated the success of this approach, we now need to scale up. I am happy to say that Uganda has shown the way forward in incorporating the policy recommendations as part of national TB control policy, and in taking steps to expand the approach nationwide.

Successful TB control requires the contribution of many partners. In the global village, all countries need to play a full part in supporting each other's TB control efforts. Communities have a crucial role to play in their contribution to the provision of TB care, along with the full range of other health service providers. I congratulate the World Health Organization and collaborating agencies in providing this review of experience in community contribution to TB care and recommendations to national TB programmes. I wholeheartedly endorse these recommendations and encourage international and national authorities to implement them without delay. We need to empower our communities, who know the problem and the solution. Let us act with our communities. Together we can stop TB.



Dr Francis Omaswa
Director-General Health Services, Ministry of Health, Uganda

GLOSSARY OF ABBREVIATIONS

CDC	United States Centers for Disease Control
CHW	Community health worker
DOT	Directly observed therapy
DOTS	The internationally recommended TB control strategy
HIV	Human immunodeficiency virus
IUATLD	International Union Against TB and Lung Disease
KNCV	Royal Netherlands TB Association
NGO	Non-Governmental Organization
NTP	National TB Programmes
PAHO	Pan American Health Organization
PHC	Primary health care
PI	Project investigator
PLWH	People living with HIV
PTB	Pulmonary TB
TASO	The AIDS Support Organization (Uganda)
TB	Tuberculosis
TB/HIV	HIV-associated TB
UNAIDS	Joint United Nations Programme on HIV/AIDS
USAID	United States Agency for International Development
WHO	World Health Organization

Summary of experience and evidence

- Globally, there is substantial experience of community involvement in the provision of health care. This includes community representation on hospital boards, community advisory boards to health services, community control of health services, and community volunteer activity at all levels including the direct provision of care.
- In many developing countries, community participation is extensive as a key principle of primary health care.
- Communities have been involved in TB care activities at least since the advent of anti-TB chemotherapy, with effective treatment programmes operating outside of hospitals, e.g. through local health centres, with the contribution of community members.
- WHO expert committees have recommended community involvement in TB control activities for many years.
- In parts of the world, and especially much of sub-Saharan Africa, the substantially increased TB case load that has been fuelled by the HIV epidemic means that NTPs can no longer cope if they have to rely on government health services alone for the provision of care.
- WHO has coordinated the "Community TB care in Africa" project in 8 districts in 6 countries badly affected by TB/HIV (Botswana, Kenya, Malawi, South Africa, Uganda and Zambia). The main focus of the project was community contribution to effective TB care by supporting TB patients throughout treatment until cure (including directly observing the initial phase of treatment). The aim of the project was to demonstrate that decentralising the provision of TB care beyond health facilities and into the community can contribute to improving NTP performance. The project outcomes were effectiveness, affordability, cost-effectiveness and acceptability of TB care.
- The project showed that in a variety of settings, the provision of community care, including the option of community DOT, was typically well received.
- There is a great need and substantial opportunity to link TB and HIV/AIDS prevention and control activities at community and primary health care level.
- Treatment outcomes among patients cared for in the community were either equivalent to or (more frequently) improved, compared with patients treated through health facilities. Treatment success rates often reached the global target of 85% (taking into account the frequently high TB case fatality in high HIV prevalence populations).
- Costs associated with community-based DOT were typically 40-50% lower than health facility-based care, and cost-effectiveness of community-based DOT was approximately 50% higher.
- In response to these findings, more NTPs in Africa are now beginning to introduce and expand implementation of community-based DOT, as part of routine NTP activities.

- In Latin America there are examples of substantial community involvement in TB care based upon a variety of well-established community development and community health organizations. Activities including case finding, community-based DOT, defaulter tracing, support groups and lobbying local governments. There are, however, very few data on the impact of community involvement on treatment outcomes.
- In Asia, there are examples of extensive community involvement in TB care based on a network of community-based NGOs that range from the very large to the very small. In some settings, these NGOs act on behalf of the NTP for large geographical areas. In others they act in a much more limited capacity with a focus, for example, on community-based DOT in a small area. Treatment outcome data usually show satisfactory cure rates of 80-90% where NTPs work with these NGOs.

Summary of policy recommendations

1. NTPs, health service providers and communities should take steps towards harnessing community contribution to TB care.
   - This is especially, but not exclusively, so for settings where the TB case load is outstripping currently available resources.
   - Even in those settings not currently experiencing an overwhelming case load, increasing community contribution, including community-based DOT, may expand access to treatment, and may further improve treatment outcomes.
2. Community contribution to TB care should be closely linked to, or integrated with, local NTP activity.
   - Community contribution to TB care should be seen as complementing and extending, rather than replacing, NTP activity.
   - Effective community contribution to TB care, especially community-based DOT, requires a robust reporting system, access to laboratory facilities and a secure drug supply, through the NTP, as well as regular support, motivation, instruction and supervision.
3. Rather than setting up new systems, groups and organizations, existing community groups and organizations should first be approached to determine how they might be able to make a contribution to community TB care. For example, HIV/AIDS community organizations and groups represent an opportunity for collaboration with NTPs.
4. While community contribution to TB care (including DOT) is often cheaper and more cost-effective than hospital-based care, new resources are needed for start-up and some running costs, e.g. in training and supervising community supervisors and volunteers.
5. The selection of community volunteers and the way in which they contribute to TB care should involve collaboration between the NTP, TB patients, community representatives and community group leaders.
6. Training requirements may vary depending on the setting, ranging from "on the job instruction" by NTP staff to more formal short courses of instruction supported by regular updates.

7. Community volunteers need regular support, motivation, instruction and supervision by NTP staff to ensure quality outcomes are maintained.
8. NTPs should consider what incentives for community volunteers, if any, are needed or appropriate in their local setting.
9. Regular audit and reporting of results is important to monitor and evaluate community contribution to TB care in each programme.
10. NTPs should choose the drug regimens (consistent with national policy and international recommendations) for use in community-based programmes which facilitate this approach, e.g. oral and intermittent regimens can increase TB patient convenience and acceptability, without reducing effectiveness.
11. NTPs need to consider the key issues of sustainability and expansion of community contribution to TB care, and collaboration with HIV/AIDS programmes (leading to integration where demonstrably beneficial).

INTRODUCTION

This chapter sets out the structure of this document, describes the rationale for the contribution of the community, as one of a wide range of health service providers, to TB care, indicates the links between TB and HIV/AIDS community care, and defines some commonly used terms.

1.1 Structure of document

The Executive Summary synthesises the experience and evidence of community contribution to TB care reviewed in this document, and the main policy recommendations arising from this experience and evidence. Chapters 1 and 2 set the scene for accounts of experience of community TB care in different regions in Chapters 3 (Africa), 4 (Asia) and 5 (Latin America): Chapter 1 sets out the rationale for community contribution to TB care, indicates the links between TB and HIV/AIDS care, and defines some commonly used terms; Chapter 2 reviews community participation in primary health care in general (and the lessons relevant to TB care in particular) and of the ways in which communities can potentially contribute to TB care.

Chapter 3 describes the overall "Community TB Care in Africa" project, coordinated by WHO in response to the identified need in sub-Saharan Africa to improve TB care in the face of limited resources. There are standardised summaries of each of the individual participating projects, including summarised results of the evaluation of TB programme performance and of costs and cost-effectiveness. Chapters 4 and 5 consist of reviews of community contribution to TB care commissioned by WHO in Asia and Latin America respectively. Chapter 6 sets out the policy recommendations reflecting the regional experiences described in Chapters 3, 4 and 5. Chapter 7 looks towards the future, suggesting the priority operational research issues and exploring the expanded scope of community contribution to TB care in future.

There are four annexes. Annex 1 summarises the economic methodology used in the health economics evaluations performed in five of the individual projects under the overall "Community TB Care in Africa" project. Annex 2 provides the detailed data from the individual projects under the overall "Community TB Care in Africa" project. Annex 3 provides a practical "how to" guide (based on the approach developed in Uganda) for conducting, reviewing and then implementing the DOTS strategy at district level, incorporating the option of community DOT. Annex 4 consists of the practical "Guide for tuberculosis treatment supporters" previously published as a separate WHO document (WHO/CDS/TB/2002.300).

1.2 Background

In exploring the linkages between health and development, the Commission on Macroeconomics and Health has highlighted the need for increased health coverage of the poor, which requires greater financial investments in specific health sector interventions and a properly structured health delivery system that can reach the poor. The Commission indicates that the highest priority is to create a service delivery system at the local ("close-to-client") level, complemented by nationwide programmes for major diseases. An example of this is community contribution to TB care as part of National TB Programme (NTP) activities.

The World Health Organization (WHO) and the International Union Against TB and Lung Disease (IUATLD) have promoted the integration of NTP activities with the activities of general health service providers, with the aim of promoting access to effective TB care. General health service providers include the following: governments, non-governmental organizations (NGOs), employers, private practitioners, religious organizations and the community. NTPs in most countries have often concentrated on promoting access to effective TB care through government health facilities. Unfortunately government health services do not typically reach all people because of inadequate health service infrastructure in some countries, insufficient decentralisation, and needs that exceed locally available resources. Community contribution to TB care as part of NTP activities has the potential to overcome some of these limitations, resulting in more widespread implementation of the internationally recommended TB control strategy (DOTS) and more efficient use of resources. Many NTPs are increasingly promoting access to effective TB care through other health service providers, including the community.

Recognition of the value of community involvement in NTP activities is not new. The Ninth Report of the WHO Expert Committee on TB in 1974 noted that "it is important that the community should be involved in the programme, including its leaders, such as village elders, tribal chieftains, or other influential persons, and the welfare organizations, including the voluntary agencies and laity". The dramatic increase in TB cases in recent years (driven by the HIV epidemic) in much of sub-Saharan Africa has greatly increased the pressure on existing government and NGO health services. This has prompted new interest in how communities might contribute to TB care, not only in sub-Saharan Africa, but also in other regions.

1.3 Links between TB and HIV/AIDS community care

TB in high HIV prevalence populations is a leading cause of morbidity and mortality, and HIV is driving the TB epidemic in many countries (especially in sub-Saharan Africa). TB and HIV programmes therefore share mutual concerns: prevention of HIV should be a priority for TB control; TB care and prevention should be priority concerns of HIV/AIDS programmes. WHO has developed a strategic framework to decrease the burden of the intersecting epidemics of TB and HIV (TB/HIV). Instead of the previous "dual strategy for a dual epidemic", the new framework represents a unified health sector strategy to control HIV-related TB as an integral part of the strategy for HIV/AIDS. The framework indicates the

applicability of health service interventions in response to HIV/AIDS at different levels of the health care system (i.e. home and community, and primary, secondary and tertiary care).

In the home and community, community support interventions for people living with HIV (PLWH) should include supporting TB patients to complete treatment. Where successful, this may pave the way for community support for the introduction of antiretroviral treatment. There is a need for targeted information, education and communication interventions aimed at encouraging PLWH to regard the development of features of TB as an opportunity to seek help for a treatable condition with the prospect of increased healthy life expectancy, rather than as an ominous sign of AIDS. TB and HIV/AIDS programmes need to collaborate in order to implement the health service interventions at the home and community level.

1.4 Definition of terms

Community may be defined as "a group of people who have something in common and will act together in their common interest.... Many people belong to a number of different communities; examples include the place where they live, the people they work with, or their religious group".

Community contribution to TB care is explicitly a contribution to, and not a substitute for, NTP activities. Responsibility for TB control must remain with the NTP. Communities may contribute to TB care in various ways, such as through:

- Supporting patients throughout treatment until cure (including DOT in the initial phase)
- Patient, family and community education
- Case finding
- Lobbying for government commitment to TB control
- Increasing accountability of local health services to the community

Community health workers (CHWs) are involved in health activities in their own community, but not as formal government employees. CHWs may or may not receive an incentive.

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REVIEW OF COMMUNITY CONTRIBUTION TO TB CARE

The two objectives of this chapter are firstly, to review community participation in primary health care in general and in particular the lessons relevant to TB care, and secondly to review community contribution to TB care and the ways in which communities can potentially contribute to TB care.

2.1 REVIEW OF COMMUNITY PARTICIPATION IN PRIMARY HEALTH CARE IN GENERAL: LESSONS FROM THE 1980S

In 1977 the World Health Assembly adopted the goal of 'Health for All by the Year 2000'. In 1978 the joint WHO/UNICEF Conference at Alma Ata accepted primary health care (PHC) as the strategic principle to reach that goal. PHC principles state that health services should be based upon the participation of the population, should be accessible, tailored to local needs, cost-effective, characterised by inter-sectoral co-operation, and functionally coherent. Community participation is important because:

- Health will only be improved if people in the community change their attitudes and actions towards the causes of poor health
- Health services may be misused and underused, and this can only be corrected if the users can help plan the service
- Community members have untapped resources in terms of money, manpower and materials
- Health is an issue of social justice and a redistribution of resources in favour of the poor has to be made.

Two broad approaches to direct community participation exist. The medical approach defines health as the absence of disease and community participation as activities undertaken by groups of people following the directions of medical professionals in order to reduce illness. A more inclusive health services approach involves a broader definition of health and community participation, including the mobilisation of community members to take an active part in the delivery of health services.

Using this distinction, CHWs may be seen, wrongly, as merely a source of cheap workers or, more constructively, as community representatives actively involved in the entire process of planning, implementing, monitoring and evaluating health programmes and services. Similarly, the community may be seen as a mere "outreach" (further decentralisation of government services) or ideally as a real partner in providing health services such as DOT, which need not remain the province only of formally trained health professionals.

The principles guiding the establishment of partnerships with the community are those of subsidiarity, solidarity and responsibility. Subsidiarity means that a higher institution

(e.g. government) should give over to the community what the community can accomplish by its own enterprise. This requires discussion and acceptance by the parties of clear terms of reference. Solidarity refers to the expression by citizens of the need to be united, to share the needs and problems of others, and to recognise and defend the dignity of each individual. Responsibility refers to the need for individual citizens and social groups in exercising their rights to have regard for the rights of others, do their own duties to others and seek the common good of all.

2.2 Lessons learned from community health worker programmes relevant to TB control

The key lessons from the evaluation and review of CHW programmes in the 1970s and 1980s are of value to planners of TB control programmes.

Recruitment

Some community-based CHW programmes failed to recognise and use existing networks, leaving behind inactive community-based committees and organizations. CHWs and their programmes show higher levels of acceptance and lower attrition rates if they come from the community, are identified and selected by the community, and are resident in the community. Selection processes need to be as inclusive as possible, so that as many community members and groups as possible subsequently make use of the CHWs. Gender is an important criterion. Female CHWs may be more diligent and less likely to be motivated by ambition or the hope of material reward than men. In many settings, CHWs must come from the same ethnic or religious group as the community itself. It is important to remain alert to the fact that strict geographical coverage (such as a local government area) may be less important than more functional areas (such as villages served by a particular trading centre), and that these networks may change over time.

Motivation

Factors that play a vital role in the motivation of CHWs are support from health services staff and the community, supervision and training, adequate supplies, and a reasonable activity level. Financial incentives may come from 3 sources: the government, NGOs and the community itself, and local preferences must be considered if sustainability is to be assured. It may also be important for local community-based organizations to be formed by volunteers, in order to create peer-support mechanisms.

Determinants of success and key lessons learned

Key determinants of success in the TB programmes reported in the literature include:

- Good collaboration between the general health services, NTP and the community group
- Good education of the TB patient and family
- Training of community members and the health services staff
- A system of regular supervision of community members by NTP staff.

Substantial challenges include:

- Identification of the leadership responsible for managing the change process and of the appropriate community group
- Maintaining community motivation
- Ensuring good communication links between the different elements of service provision.

2.3 CHW PROGRAMME ACTIVITY AND NGO LINKS

The potential for a community to contribute to TB care depends at least in part on the opportunity for individuals to be involved in community initiatives. This includes the development of civil society, the presence of NGOs, philanthropic bodies and patient groups, a supportive political climate and population stability. The different ways in which communities may participate in TB care may depend on the level of socio-economic development, the particular cultural setting, and the degree of priority for TB control among other health activities. While the principles of community contribution to TB care are generalisable (such as the need for close links between the general health services, NTP and community group), the details of how communities make that contribution (such as the most appropriate community group that can supervise patients) will depend on the specific setting.

NGOs often play an important role in community contribution, since they are usually closer to the community than the formal health care sector. The extent of NGO involvement in community contribution to TB care depends on how governments take responsibility for the health care sector in each country. Community participation in TB control is likely to be particularly successful where community participation is already part of the health care system.

The support of community organizations, community leaders, politicians, policy-makers in health ministries, and organizations of health professionals is necessary in order to translate lessons learned from projects into policy and practice aimed at extending on a wide scale community contribution to TB care. Obtaining this support depends on involving these groups from an early stage in developing and implementing projects and on maintaining involvement through good communication and advocacy.

2.4 REVIEW OF PUBLISHED EXPERIENCE IN COMMUNITY CONTRIBUTION TO TB CARE

A review published in 1999 summarised important features of studies of community contribution to TB care (Table 1) which emphasised the community role in supporting TB patients (including DOT) to complete their treatment. Several key themes emerge from these studies. Establishing the community approach involves several steps, including health education of patients and the general community, training and supervision of the community members contributing to TB care and of health workers, improved provision and supply of drugs, and establishment of a suitable recording and reporting system.

These reports suggest that communities can successfully contribute to TB care in a variety of settings. A key challenge is broadening the scale and scope of these programmes, while maintaining good results. The reports summarised in Table 1 contain little information on cost-effectiveness. Measuring the cost-effectiveness of an intervention is crucial to inform decisions about the allocation of resources for health care. It is useful to compare the cost-effectiveness of provision of TB care through the usual system of health facilities with a system which also includes the option for TB patients of community contribution to TB care.

2.5 Ways in which communities can potentially contribute to TB care

The public health approach to TB control rests on detection and cure of the infectious cases. In 1991 the forty-fourth World Health Assembly set targets for global TB control. These are to cure 85% of the infectious TB cases and to detect 70% of such cases. The ways in which communities can potentially contribute to TB control as part of NTP activities are therefore activities which help to improve case detection and treatment outcomes. The initial emphasis is on improving treatment outcomes rather than intensifying case-finding. It is important to expand case-finding only in settings achieving a high cure rate, otherwise expanded case-finding with a low cure rate results in increased numbers of inadequately treated TB patients (contributing to an increased pool of infectious cases) and increased drug-resistance. In settings achieving high treatment success rates, it will be valuable to explore how community contribution to TB care can also extend to helping identify TB suspects in order to intensify case-finding.

See Table 2 for a summary of the ways in which communities can potentially contribute to TB care

Direct observation of therapy (DOT)

One element of the internationally recommended TB control strategy known as the DOTS strategy is the provision of short-course chemotherapy under proper case management conditions. These conditions include DOT for all smear-positive pulmonary TB patients. DOT is one of a range of measures recommended by WHO to promote adherence to treatment and hence cure. In many areas patients are admitted to hospital for the first 2 months of treatment or travel daily or three times weekly to a health centre for DOT. This can result in considerable costs to the patient, an economic burden on the family, and may discourage adherence. Organised community groups, peer groups, chosen members of the community, and family members all have the potential to act as supervisors to ensure completion of treatment and hence cure.

Support and motivation of patients

TB treatment is long, symptoms typically disappear well before treatment is complete, and the drugs used may cause side-effects. Community members are well placed to help support and motivate patients during treatment. This may be done by raising awareness of the benefits of completing treatment, providing general support, and directly observing patients taking their medication.

General support

In leprosy control and AIDS care programmes, home visits by community members and self-help groups are two strategies used to support patients treated in the community. Sharing fears, beliefs and experiences with others with the same disease may be beneficial. Family support is also clearly critical. Support for patients to promote adherence to treatment should be built into all TB control programmes. In addition to enlisting family support, community members can be approached to volunteer as house-to house supporters for TB patients, and the patients themselves encouraged to establish self-help groups.

Case detection

Not all people with TB come forward for treatment. Case-finding in the community may help NTPs that already achieve high cure rates to make progress towards the WHO target of 70% case detection. Community-based surveillance has been shown to be sustainable in some settings, as CHWs know their local community well. CHWs may be involved by referring TB suspects for diagnosis, delivering sputum specimens to health care facilities and collecting results. It is important to clearly define the role of the CHWs in each setting, and diagnosis and prescription of treatment must remain the responsibility of the health professional.

Increasing community awareness

Many health programmes have used informal and formal ways of raising awareness. Leprosy control programmes have shown that schoolteachers and students can provide health education and motivate patients to continue treatment. School children have successfully encouraged families to practice hand washing and use latrines. More formally, CHWs were more suitable than physicians as educators to increase compliance in guinea worm eradication programmes. Lessons from sanitation programmes indicate the importance of the content of the messages with a focus on individual benefits rather than ideal behaviours or community benefits.

The common symptoms of TB are non-specific and TB is also often perceived as a chronic, incurable disease. TB programmes could use a variety of community members to help spread messages to TB patients to raise awareness of the benefits of completing treatment. Messages via the mass media could complement those given by community members. Messages could encourage patients to complete treatment in order to restore full participation in society and prevent relapse or drug resistance. TB control programmes could take advantage of existing community resources to enhance community knowledge of TB. Community members already directly involved with TB patients could collaborate with health workers to provide patients with accurate information regarding length of treatment and known side-effects. Various community members, including village leaders, schoolteachers, CHWs, religious leaders, trade unions and women's organizations, have the potential if mobilised to successfully raise awareness of the signs and symptoms of TB and the availability and benefits of its treatment. However awareness campaigns will only have a positive impact if diagnosis is available and treatment is readily accessible.

Access to drugs

TB treatment and control requires an uninterrupted drug supply. Distribution of drugs is an acceptable, effective and sustainable function for a CHW, and it may empower the community by providing access to treatment, enhancing the status of the CHW, and addressing the true needs of communities. Interestingly, communities may attach a higher value to CHWs that provide drugs than to those that focus on preventive and promotive care only. Thus involving the CHWs in TB drug distribution may enhance their status and hence the impact of other programmes. Practical lessons that have been learnt from community-based drug distribution programmes include:

- Programmes are dependent on good drug supply at central stores down to district and health centre level
- Communication between drug distributors and stores is essential
- Programmes planned by the community are more likely to be sustainable than those planned by health professionals
- The higher the level of participation the greater the success of the programme
- Home visits for drug delivery, while apparently very convenient, are not always welcomed by patients with stigmatised diseases (including TB)
- Community members are able to evaluate the appropriateness of house-to-house versus central distribution and change their strategy accordingly.

TABLE 1 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 (standard WHO/IUATLD treatment outcome definitions)
1978	Philippines[1]	2 rural slums 1 urban slum	Rural Urban	175	Smear positive PTB New and retested	Lay volunteers	90% cure rate
1990	Philippines[2]	Manila	Urban	144	Smear positive PTB	Church group volunteers	80% treatment success rate
1997	Bangladesh[3]	Thanas	Rural	1525	New smear positive PTB	Members of rural advancement committee with financial incentive	Cure rate >85%
1997	Haiti[4]	Artibonite Valley	Rural	138	New smear positive PTB	Lay persons and former patients Financial incentive	87% treatment success rate
1996	South Africa[5]	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[6]	KwaZulu Natal	Rural	535	All Forms	Community health workers, lay people, volunteers	>85% treatment success rate in survivors
1997	Nepal[7]	4 national demonstration centres	Rural	270 New smear positive cases 310 other forms	All forms	Community workers, social workers	85% cure rate
1997	Indonesia[8]	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[9]	12 provinces	Rural and Urban	55 213 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[10]	Eastern and central Nepal	Urban and peri-urban		All forms	Health centre, family/community, none	91%, 57%, 34% cure rate respectively
1993 1998	Sulawesi[11,12]	4 rural districts in Central Sulawesi including 224 villages and 362,000 people	Rural/ remote	12000	All forms	Health centre, family/community	93%, 87% treatment completion rate for smear positive and smear negative cases respectively
1992 1995	South Africa[13]	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; and publications as referenced. Reproduced with kind permission of IJTBLD.

References for Table 1

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13 *Edginton ME. TB patient care decentralised to district clinics with community-based directly observed treatment in a rural district of South Africa. International Journal of TB and Lung Disease 1999; 3: 445-450.*

Addressing stigma

Stigma is a barrier presenting a serious obstacle to successful TB control. Health-seeking behaviour includes a balancing of costs and benefits to the patient. The benefits of getting well may out-weigh the costs of social and family rejection, and loss of employment or accommodation, for example. A direct approach to address stigma involves understanding the beliefs and attitudes of the community towards the disease through qualitative research and then addressing them through awareness campaigns. An indirect approach to reducing stigma is to create more socially accessible services, by associating the stigmatised disease with a non-stigmatised disease treatment. This was done in Pakistan when family planning services were integrated into the primary health care system, resulting in improved social accessibility for women. By integrating with regular health services, and by increasing community involvement, stigma associated with TB should fall.

Recognising adverse effects and tracing patients who interrupt treatment

Patients suffering severe side-effects are likely to interrupt their treatment, and CHWs and trained volunteers could usefully help patients to recognise adverse drug reactions, and refer them to the health clinic. Tracing patients who interrupt treatment remains problematic, but is important if cure rates are to increase. Community-based supervisors could maintain close contact with patients and their social networks and hence trace any patients that default.

Documentation of progress and outcome

Data collection, recording and reporting are vital components of TB control programmes. Increasing the role of communities in TB care will mean transferring some of this responsibility to community members. This may lead to some improvements in reporting treatment outcomes, e.g. less mis-reporting of deaths as defaults. In some primary health care and disease control programmes, accurate and timely record keeping has been problematic.

Innovative solutions may include:

- Use of manuals, including record keeping to enable illiterate or semi-literate community members to keep records accurately, using pictures and symbols to replace word and numbers
- Formation of CHW associations to provide mutual support and peer pressure for record completion
- Use of school children or literate family members or neighbours to read instructions and complete records.

TABLE 2 SUMMARY OF POTENTIAL FOR COMMUNITY INVOLVEMENT IN TB CONTROL

Purpose of community involvement	Type of community involvement	Activity	Comments
Raising community awareness of TB and TB treatment	Formal/informal	Delivery of messages to promote knowledge of TB symptoms and need for treatment completion	Peer educators have limited usefulness
Case detection and referral for diagnosis	Formal	CHW surveillance	Combining two diseases or activities makes surveillance more cost-effective
Providing access to drugs	Formal	CHW's as providers of TB drugs	Combining with a non-stigmatised disease or integrating with PHC increases the social acceptability of treatment
Addressing stigma: direct approach	Formal/informal	Disseminating information through home care volunteers or through communication and discussion groups	Patients, providers and the community are involved in communication and discussion
Addressing stigma: indirect approach	Formal	Integrating community-based TB control programmes with non-stigmatised health care programmes or primary health care	
Raising awareness to encourage compliance	Formal/informal	Disseminating information and encouraging compliance	Messages should address individual benefits of treatment completion Known side effects of treatment should be explained
General support	Formal/informal	Family support, peer groups and community volunteers to support patients throughout treatment	Psychological support and assistance in the delivery and collection of sputum samples, results and drugs
Direct observation of treatment	Formal/informal	CHW, family member or other community member to observe patients taking medication	The majority of innovative approaches are in the area of community-based TB control
Recognition of adverse effects and tracing of patients who interrupt treatment	Formal	CHW to recognise 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	To support patients and carers through all aspects of patients illnesses (TB and HIV associated). Variable from country to country and setting.
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	Illiterate community volunteers from low socio-economic groups provide services to favour the disadvantaged in the community

Source: Hadley M, Maher D. Community involvement in TB control: lessons from other health care programmes. International Journal of TB and Lung Disease 2000; 4: 401-408. Reproduced with kind permission of IJTBLD.

Summary

The wide experience of community participation in PHC, and the specific experience so far of community contribution to TB care, point the way towards a significant step in the evolution of provision of TB care, beyond the hospital and health facility, and into the community. Essential elements of success appear to be good collaboration between the health sector and community organizations, education of the patient and family members, and training and supervision of community workers. Ensuring provision of care that is convenient and accessible to patients is essential to ensure successful treatment and cure. Providing TB care in the community represents an opportunity to make TB care more widely available and accessible. The challenge lies in harnessing community participation in ways that contribute to community development and are effective, acceptable, affordable and cost-effective.

Further reading

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THE "COMMUNITY TB CARE IN AFRICA" PROJECT

This chapter describes the overall "Community TB Care in Africa" project, including the project background, aims and objectives and the process of project implementation. There are standardised summaries of each of the individual participating projects, and also of three other related projects which received some technical support from WHO but did not fall directly under the "Community TB Care in Africa" project. Annex 2 provides the detailed data from the individual project sites participating in the overall "Community TB Care in Africa" project. At the end of the chapter is a brief description of the process of expansion of the community TB care approach in several of the countries participating in the overall project.

3.1 Project background, aims and objectives

Background

The HIV-fuelled TB epidemic is outstripping the ability of health services to cope with a very large increase in the number of TB cases in many countries in sub-Saharan Africa. Since NTPs are often not achieving adequate case-detection and treatment outcomes, it is necessary to explore ways of complementing government health service provision of TB care.

A WHO-coordinated mission in 1995 assessed TB care in community-based organizations in several countries and recommended operational research to evaluate the potential of community organizations to contribute to the delivery of effective TB care, as part of NTP activities. Since 1996 WHO has coordinated a project evaluating the community contribution, through NTPs, to effective TB control in sub-Saharan Africa.

The multi-national, collaborative "Community TB care in Africa" project involved 8 district-based projects in 6 countries badly affected by TB/HIV (Botswana, Kenya, Malawi, South Africa, Uganda and Zambia). The main focus of the project was the community contribution to effective TB care by supporting TB patients throughout treatment until cure, including directly observing the initial phase of treatment.

Aim and objectives

The aim of the project was to demonstrate that decentralising the provision of TB care beyond health facilities and into the community can contribute to effective NTP performance. The project outcomes are effectiveness, affordability, cost-effectiveness and acceptability of TB care. As a standard indicator of NTP effectiveness, "treatment success"= "cure + treatment completion" for new smear positive TB cases.

3.2 Project development and implementation

The project resulted from an assessment in 1995 in four countries in sub-Saharan Africa of the quality of TB care in several community and home care programmes, most of which had a focus on HIV/AIDS care. The assessment showed that the quality of TB care was generally low on account of the lack of links between the community and home care programmes, the district general health services and the NTP. Nevertheless, these programmes had the potential to contribute effectively to TB care, provided these links were developed. The project to evaluate community contribution to TB care as part of NTP activities began in 1996 with mobilisation of funding, identification of project sites and investigators, and development, review and approval of project proposals. After preparations including training, the PIs of the 8 district-based projects began implementing the option of community DOT in early 1998.

In all projects the intervention was the involvement of trained and supervised community members (community TB treatment supporters) in supporting TB patients and directly observing their treatment. TB patients thus had the option of community DOT, in addition to health facility DOT (as an in-patient or out-patient). The initial emphasis in the projects was on improving treatment outcomes rather than intensifying case-finding. It is important to expand case-finding only in settings achieving a high cure rate, otherwise expanded case-finding with a low cure rate results in increased numbers of inadequately treated TB patients (contributing to an increased pool of infectious cases) and increased drug-resistance.

Implementing the option of community DOT involved addressing the following issues:

- Identifying and mobilising the appropriate community organization
- Developing links between general health services, the NTP and community organizations
- Training, supervising and supporting community treatment supporters
- Developing and introducing recording and reporting systems in the community
- Distributing anti-TB drugs and preventing potential abuse (particularly of rifampicin)
- Extending the current management responsibilities of NTPs.

Project Investigators (PIs) from the "Community TB Care in Africa" project met in Zimbabwe in 2000 to share results, consider lessons learned and help formulate policy recommendations.

(*World Health Organization. "Community TB care in Africa". Report on a "lessons learned" meeting in Harare, Zimbabwe, 27-29 September 2000. World Health Organization, Geneva, 2000*).

Section 3.3 provides summaries of each individual project. Bar charts at the end of each summary show the relevant results (treatment outcomes, costs and cost-effectiveness) for the different projects, generally comparing in each case the standard approach with the new approach involving decentralisation and community DOT. For the 5 projects undertaking an economic evaluation, one bar chart shows the cost per patient treated (indicating affordability) and another bar chart shows the cost per patient successfully treated (indicating cost-effectiveness).

3.3 PROJECT SUMMARIES

3.3.1 FRANCISTOWN, BOTSWANA

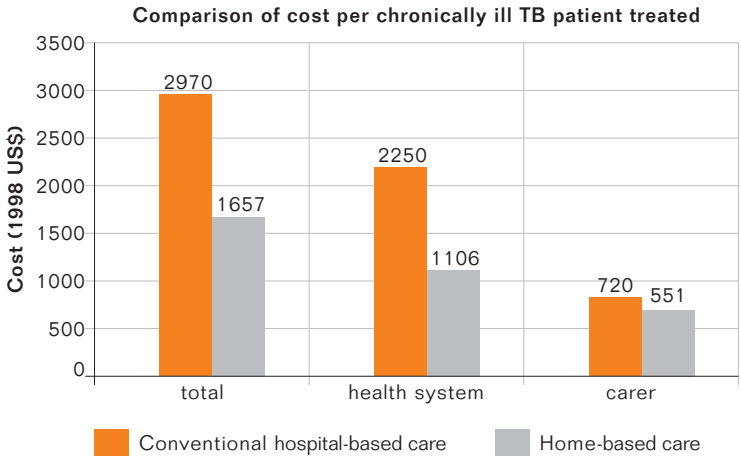
Setting: Francistown, the second largest city in Botswana (population approximately 100,000). In 1999, 795 TB cases were registered and about 85% of hospitalised TB cases were HIV-infected. Only those patients too sick to receive ambulatory care at their neighbourhood clinic were hospitalised. In 1986 Botswana adopted the WHO-recommended DOTS strategy for TB control and the TB case rate continued to decline until the 1990s when the rate increased by more than 150%. Most of this increase was attributed to the HIV epidemic and it was estimated that in 1999, 34% of the sexually active population aged 15-49 years was HIV infected in Botswana. Complementing a strong health system and NTP, the introduction of a government home care programme in Francistown in 1996 enabled the increasing number of chronically ill TB patients with AIDS, who could not readily reach clinics for DOT, to take up the option of home DOT. The home care programme is open to any needy patient, but the large majority have HIV/AIDS. For patients with TB, caregivers collect drugs from the neighbourhood clinic daily or weekly and record treatment on a card after directly observing treatment being taken. Overall supervision was by the home care team.
Objective: To compare the cost and cost-effectiveness of treatment for 50 chronically ill TB patients who opted for home-based DOT with the cost and cost-effectiveness which would have occurred if they had been hospitalised.
Design: Costs for the 2 strategies were analysed from the perspective of the health system and caregivers, in 1998 US$. Caregiver costs were assessed using a structured questionnaire administered to a sample of 50 caregivers. Health system costs were assessed using interviews with relevant staff, and data from medical records and expenditure files. These data were used to calculate the average cost of individual components of care, and, for each alternative strategy, the average cost per patient treated. Cost-effectiveness was calculated as the cost per patient compliant with treatment. 50 patients receiving home-based care were compared with 50 receiving hospital-based care. The compliance rate was the measure of effectiveness. This was assumed to be 100% for hospitalised patients, and for home-based care was measured from treatment cards that documented drug doses given by home carers.
Findings: Caregivers were predominantly female relatives (88%), unemployed (48%), with primary school education or less (82%), and with an income of less than $1,000 per annum (71%). Of those patients with an HIV test result, 98% were HIV-positive. Home-based care reduced the cost per patient treated by 44% compared with hospital-based treatment (US$1,657 vs. US$2,970). The cost to the caregiver was reduced by 23% (US$551 vs. US$720), while the cost to the health system was reduced by 51% (US$1,106 vs. US$2,250). The cost per patient complying with treatment was $1,726 for home-based care and $2,970 for hospitalisation.
Conclusion: Home-based DOT is more affordable and cost-effective than hospital-based DOT for chronically ill TB patients, though costs to caregivers remain high in relation to their incomes. Home-based DOT is a useful strategy for chronically ill patients, complementing the option of clinic-based DOT for less sick patients. Home-based care was not objectively assessed for its acceptability. However, the investigators reported their impression that caregivers, patients and health workers considered home-

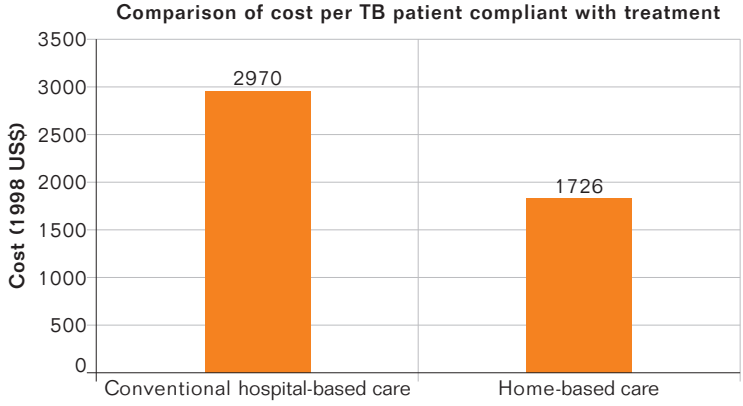
based care more culturally and socially acceptable. The investigators concluded that structured home-based DOT should be included as a component of the NTP, especially in urban Botswana.

See Annex 2 for detailed data from this project.

(*Moalosi G, Floyd K, Phatshwane J, Moeti T, Binkin N, Kenyon T. Cost-effectiveness of home-based care versus hospital care for chronically ill TB patients, Francistown, Botswana. International Journal of TB and Lung Disease. In press.*)

Graphs summarising cost and cost-effectiveness results for project in Francistown, Botswana





3.3.2 MACHAKOS, KENYA

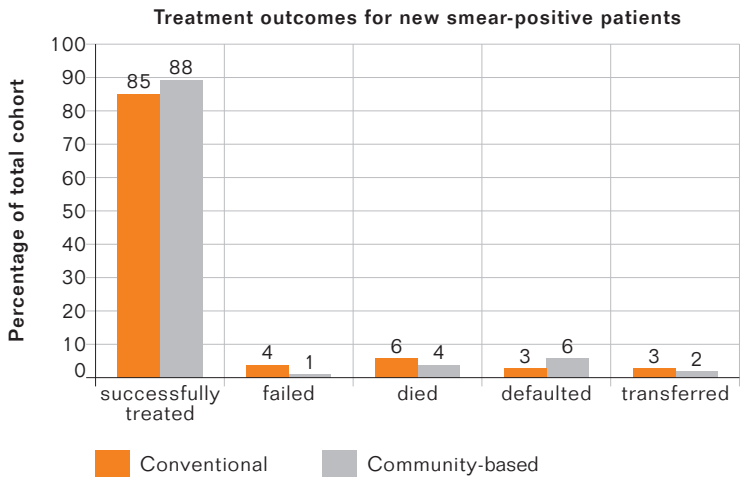
Setting: Machakos, a rural district in the Eastern Province of Kenya, 50km from Nairobi. The TB case rate has increased 4-fold in Kenya in the 1990s, and with the NTP policy of admitting all new patients for DOT, overcrowding and decreased cure rates have followed. The HIV epidemic has spread rapidly in Kenya with about half of all hospital beds filled with patients with HIV-related disease. The population of Machakos district was about 900,000 in 1999. Most residents are relatively poor, rural, subsistence farmers. In addition to the various health services there were 7 registered community care projects with 500 community-based distributors of contraception. Prior to the project all TB patients were admitted to hospital for 2 months, followed by 6 months as an outpatient, collecting drugs from a clinic each month. With decentralisation, to facilitate ambulatory care, ethambutol replaced streptomycin in a new treatment regimen (2ERHZ/6EH for smear positive cases). TB patients not living within walking distance of a health facility were given the choice of travelling to the facility for DOT, or having DOT supervision by a community volunteer. Volunteers collected drugs weekly from health facilities, provided DOT, recorded treatment, and met regularly with health service staff.
Objective: To evaluate the impact on district TB programme performance, costs and cost-effectiveness, of decentralising TB treatment by providing ambulatory care through peripheral health units and in the community.
Design: Comparison of district TB programme performance before and after the decentralisation of TB services. Costs were analysed in 1998US$ from the perspective of health services, patients, family members and the community, using standard methods. Separate analyses were undertaken for (a) new smear-positive pulmonary patients and (b) new smear-negative and extra-pulmonary patients. Cost-effectiveness was calculated as the cost per patient successfully completing treatment (smear-positive cases) and as the cost per patient completing treatment (new smear-negative and extra-pulmonary cases).
Findings: The number of patients registered in the control period (1996) was 1141, and almost all were admitted to hospital during the initial phase. In the intervention period (1998 and 1999) 3244 patients were registered, and only 153 (5%) were admitted for the initial phase of treatment. Average length of stay in hospital fell from about 60 days to 4 days. Of 3244 patients, those choosing the different options for DOT supervision were: hospital clinic 1618 (50%), peripheral health unit 904 (30%), and community volunteer 569 (18%). The options were broadly acceptable to patients, families and staff. Treatment outcomes among new smear-positive patients were similar in the intervention and control cohorts: treatment success (88% vs. 85%) and death rates (4% vs. 6%). Treatment completion was significantly higher among new sputum smear-negative and extrapulmonary TB patients in the intervention period (79% vs. 48%). The cost per patient treated for new smear-positive patients was US$591 with the conventional hospital-based approach to care, and US$209 with decentralised care. The cost per patient treated for new smear-negative/extra-pulmonary patients was US$311 with the conventional approach to care, and US$211 with decentralised care. Regarding cost-effectiveness, for new smear-positive patients, the cost per patient successfully treated fell from $696 to $239.
Conclusion: The decentralisation of the intensive phase of TB treatment resulted in improved TB programme performance overall. Performance for new smear positive

cases remained high, while performance for smear negative and extrapulmonary TB cases improved substantially. Machakos hospital has closed its TB wards. Health care workers, community volunteers, and patients and their families reported a high level of acceptability with the decentralised approach. There is now a strong economic case for expansion of decentralisation and strengthened community-based care in Kenya. Indeed, as a result of the project, the NTP plans to adopt this approach as national policy.

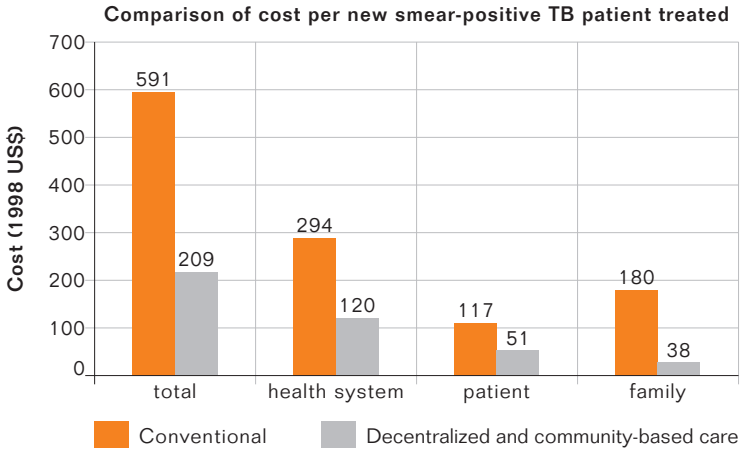
See Annex 2 for detailed data from this project.

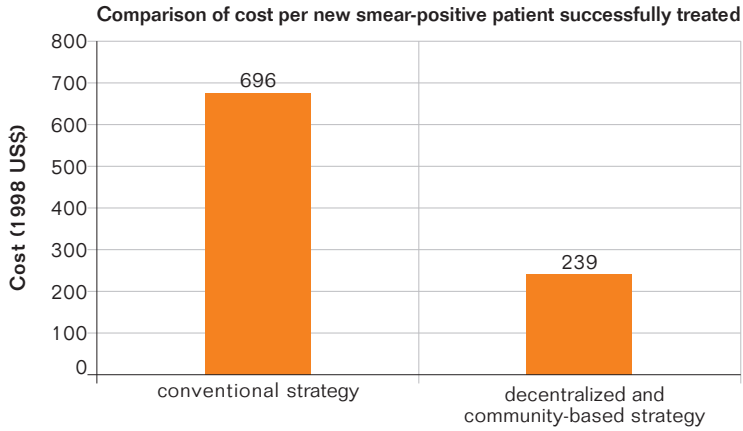
(*Kangangi J, Kibuga D, Muli J, Maher D, Billo N, Ng'ang'a L, Ngugi E, Kimani V. Decentralisation of TB treatment from the main hospitals to the peripheral health units and in the community within Machakos district, Kenya. International Journal of TB and Lung Disease. In press.*)
(*Nganda B, Wang'ombe J, Floyd K, Kangangi J. Cost and cost-effectiveness of increased community and primary care facility involvement in TB care in Machakos District, Kenya. International Journal of TB and Lung Disease. In press.*)

GRAPH SUMMARISING TREATMENT OUTCOMES FOR NEW SPUTUM SMEAR-POSITIVE PTB PATIENTS IN MACHAKOS, KENYA



GRAPHS SUMMARISING COST AND COST-EFFECTIVENESS RESULTS FOR PROJECT IN MACHAKOS, KENYA





3.3.3 LILONGWE, MALAWI

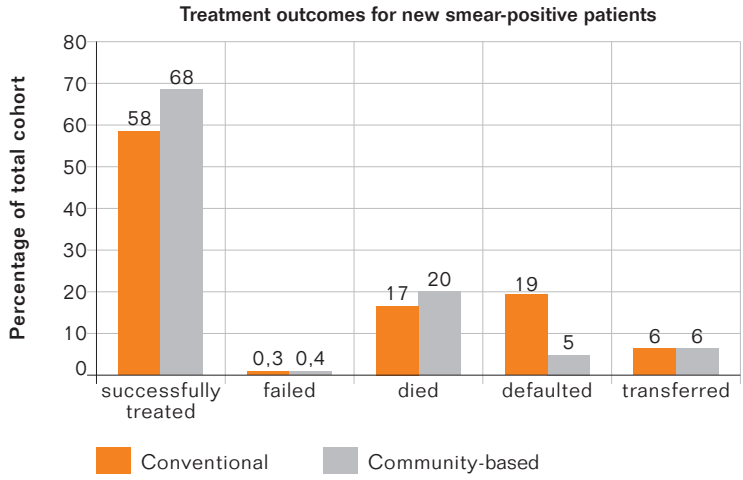
Setting: Lilongwe, the capital of Malawi. TB case rates in Malawi have increased almost 300% since the mid-1980s and there has been increasing interest in the potential for community organizations to increase the treatment capacity of the NTP. The increase is largely due to the HIV epidemic and 8.8% of the population was estimated to be HIV infected in 1999. In 2000, 77% of all TB patients were HIV infected. Lilongwe, in Central Malawi, is predominantly urban and had a population of around 1.3 million people in 1998. NTP policy was to admit all patients for the initial phase of treatment. This was restricted to smear positive cases in the major cities due to increasing numbers, but even so, bed occupancy was over 150% in Lilongwe in 1997. The number of DOT sites increased from 4 to 21, all patients received DOT in the initial

phase (not just smear positive patients), and patients were offered a choice of DOT supervision (hospital inpatient, hospital outpatient department, health centre, community volunteer or guardian). Guardians could only supervise non-smear positive cases.
Objective: I) To evaluate the impact on Lilongwe district TB programme performance of decentralisation of TB services, including extending the range of options for supervision of DOT during the initial phase of treatment, and using a fully oral, intermittent regimen ($2R_3H_3Z_3$/6HE for new smear positive cases). 2) To determine costs and cost-effectiveness.
Design: Prospective assessment under programme conditions of (a) duration of hospital stay (b) bed occupancy and (c) 8-months treatment outcomes in a cohort of patients registered before (1997) and after (1998) the introduction of decentralisation of TB services. Costs were analysed from the perspective of health services, patients, and the community in 1998US$, using standard methods. Separate analyses were undertaken for (a) new smear-positive patients and (b) new smear-negative patients. Cost-effectiveness was calculated as the cost per patient successfully completing treatment (smear-positive cases) and as the cost per patient completing treatment (new smear-negative cases).
Findings: The number of new patients (all forms) registered in Lilongwe district was 3144 in 1997 and 3761in 1998. While 25% were hospitalised, 15% had DOT through the hospital outpatient department, 29% through a health centre and 31% through a guardian. There were significant differences in all outcomes. In 1998, bed occupancy dropped by 38%. Among smear positive patients, the average length of hospital stay fell from 58 to 16 days, the cure rate was higher (64% vs 56%), the default rate was lower (5% vs 19%), and the treatment completion rate was lower (2% vs 4%). Among smear negative patients, the treatment completion rate was higher (50% vs 33%), the default rate was lower (23% vs 55%), but the death rate was higher (17% vs 4%). The cost per patient treated for new smear-positive patients was US$456 with the conventional hospital-based approach, and US$201 with decentralised care. Costs fell by 54% for health services and 58% for patients. The cost per patient treated for new smear-negative patients was US$67 with conventional unsupervised care, and US$101 with strengthened supervision including community-based DOT. Overall, for both types of patient, costs fell by almost 50%. Regarding cost-effectiveness, for new smear-positive patients, the cost per patient successfully treated fell from $786 to $296.
Conclusion: Decentralised TB services, including an extended range of supervision options for DOT and the use of an intermittent oral treatment regimen, achieved reduced hospital stay and bed-occupancy and improved treatment outcomes. Informal interviews with hospital staff indicated their satisfaction with the new system. No patients chose community volunteers over guardians or health facilities for reasons that are not clear. The increased death rate among smear negative patients was thought to be due to improved reporting. There is also a strong economic case for expansion of decentralisation and strengthened community-based care in Malawi.

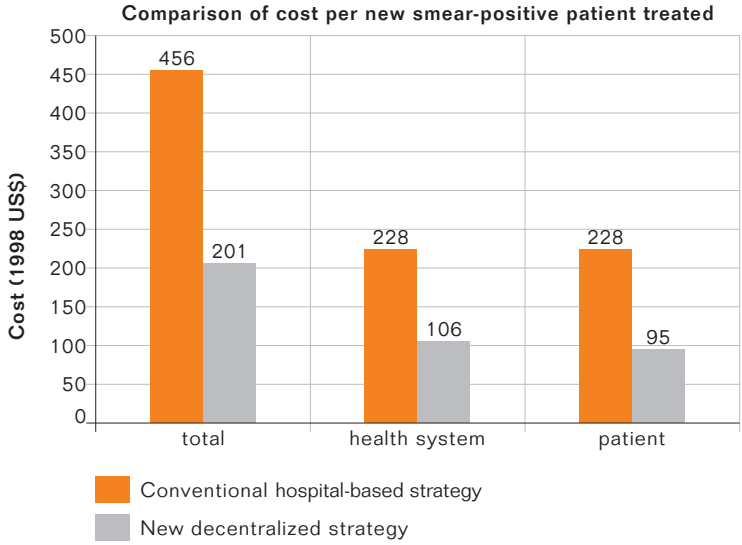
See Annex 2 for detailed data from this project.

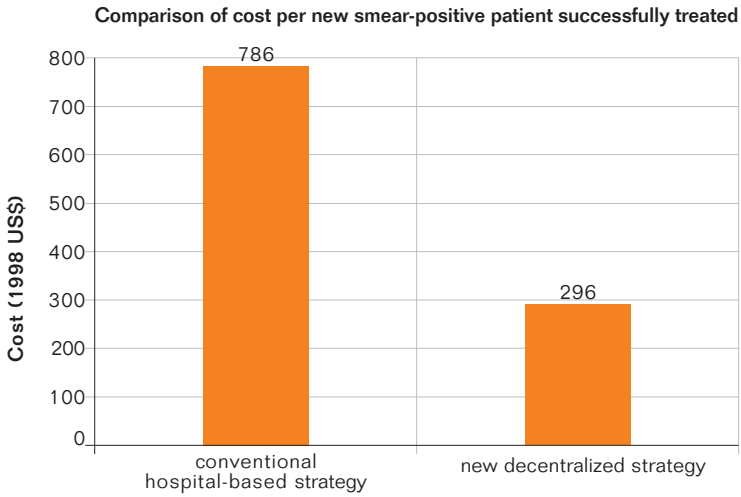
(*Nyirenda TE, Harries AD, Gausi F, van Gorkom J, Maher D, Floyd K, Salaniponi FML. Decentralisation of TB services in an urban setting, Lilongwe, Malawi. International Journal of TB and Lung Disease. In press.*)
(*Skeva J, Floyd K, Nyirenda T, Gausi F, Salaniponi F. Cost and cost effectiveness of increased community and primary care facility involvement in TB care in Lilongwe District, Malawi. International Journal of TB and Lung Disease. In press.*)

GRAPH SUMMARISING TREATMENT OUTCOMES FOR NEW SPUTUM SMEAR-POSITIVE PTB PATIENTS IN LILONGWE, MALAWI



GRAPHS SUMMARISING COST AND COST-EFFECTIVENESS RESULTS FOR PROJECT IN LILONGWE, MALAWI





3.3.4 Kiboga, Uganda

Setting: Kiboga, a rural district in central Uganda. TB care is fully integrated into the primary health care system in Uganda. At district level TB care is coordinated by a District TB and Leprosy Coordinator who supervises TB care that is delivered by staff at health unit level. DOTS was introduced in Uganda in 1995, but treatment interruption rates of 20-40% were reported. As in many other countries patients are hospitalised for the first 2 months of treatment and then have to travel long distances to receive outpatient therapy for a further 6 months. Approximately 65% of TB patients are HIV infected. The population of Kiboga was about 175,000 in 1999 with TB care delivered through its hospital and 9 health units. To trial community involvement in TB care, patients were offered the choice of 2 weeks hospitalisation followed by community based DOTS by a trained and supervised community volunteer until completion of treatment, or the usual care described above. The district public health worker identified community volunteers acceptable to the patients, through the Parish Development Committee. This health worker trained and supervised the volunteer and collected adherence data. The volunteer provided DOT. The regimen used is 2RHZE/6EH.

Objective: To determine the effectiveness, cost, cost-effectiveness and acceptability of community-based TB care using the DOTS strategy.

Design: Effectiveness was measured by comparing TB case-finding and treatment outcomes before and after the introduction of DOTS in 1998. Acceptability was measured through a questionnaire to community members, health care workers, and TB patients before and after the intervention. Costs were analysed for new sputum smear-positive pulmonary TB cases from the perspective of health services, patients, and community volunteers in 1998US$, using standard methods. Cost-effectiveness was calculated as the cost per patient successfully completing treatment.

FIndings: 540 TB patients were registered in the control period (1995-1997) and 450 patients were registered in the intervention period (1998-1999) after the implementation of DOTS. Around 80% of all patients chose community-based DOTS. Following

implementation, for smear positive cases, treatment success increased from 56% to 74% and treatment interruption decreased from 23% to 1%. There was little difference in the proportion of deaths (15% vs, 14%). More patients had follow up smears after the introduction of community-based DOTS, increasing from around 50% to 80%. Hospital length of stay fell from an average of 60 to 19 days. Acceptability of DOTS was very high among health workers, patients and families.

The cost per new smear-positive patient treated was US$510 with the conventional hospital-based approach (US$419 for the health system and US$91 for patients), and US$289 with community-based care (US$227 for health services, US$53 for patients and US$9 for volunteers). Important new costs associated with community-based care included programme supervision (US$18 and US$9 per patient at central and district levels respectively) and training (US$18 per patient). Regarding cost-effectiveness, for new smear-positive patients, the cost per patient successfully treated fell from $911 to $391.

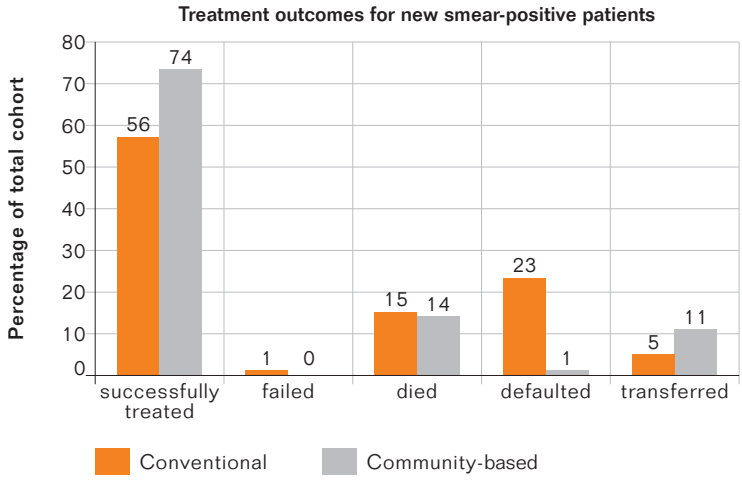
Conclusions: Community-based DOTS provided a highly effective and acceptable alternative to conventional care, with treatment outcomes substantially improved. There is a strong economic case for expansion of community-based care in Uganda, since outcomes improved while costs fell. The Ugandan Ministry of Health has adopted the community-based DOTS strategy as national policy.

See Annex 2 for detailed data from this project.

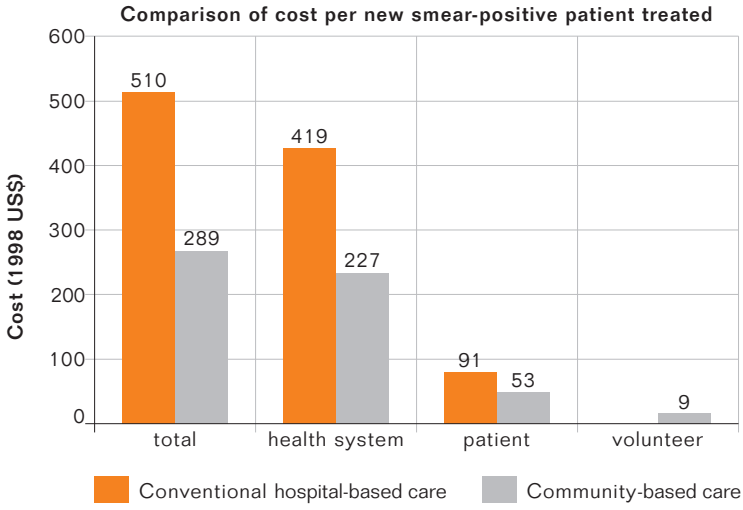
(*Adatu F, Odeke R, Mugyeni M, Gargioni G, McCray E, Schneider E, Maher D. Implementation of the DOTS strategy for TB control in rural Kiboga District, Uganda, offering patients the option of treatment supervision in the community, 1998-1999. International Journal of TB and Lung Disease. In press.*)

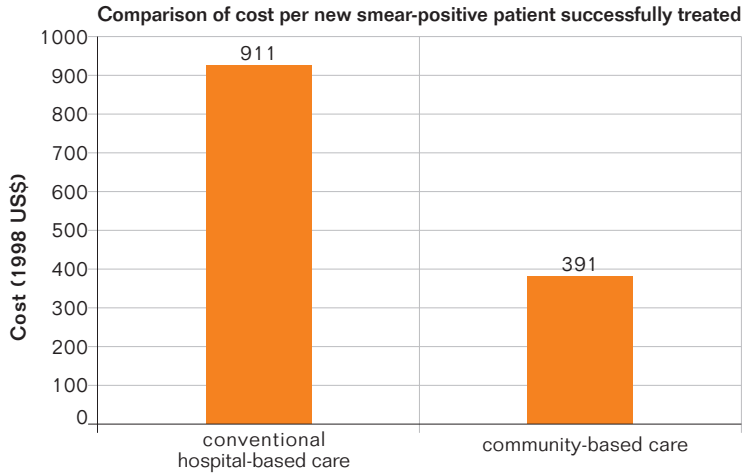
(*Okello D, Floyd K, Adatu F, Odeke R, Gargioni G. Cost and cost-effectiveness of community based care for TB patients in rural Uganda. International Journal of TB and Lung Disease. In press.*)

Graph summarising treatment outcomes for new sputum smear-positive PTB patients in Kiboga, Uganda



Graphs summarising cost and cost-effectiveness results for project in Kiboga, Uganda





3.3.5 NDOLA, ZAMBIA

Setting: Ndola district, Zambia, with a population of approximately 500,000 people. The city of Ndola is divided into 42 townships with several shanty compounds. In 1995, TB control programme performance was poor, with a cure rate of 15-20%, a default rate in the initial phase of 25% and no follow-up sputum smears at 2 months in 75% of smear-positive cases. There are several community-based home care programmes for chronically ill patients with HIV/AIDS in the area. The Catholic Diocese of Ndola provides support to these programmes in the form of technical assistance, drugs, transport and food. The community provides nursing care. In one compound, Nkwazi, the home care programme incorporated TB care and achieved treatment completion rates of 80% or more. This experience was encouraging and the study team wanted to test the impact of expanding this to another compound.

Objective: To evaluate the implementation of community-based DOT through an existing community-based HIV/AIDS home-care programme.

Design: The study enrolled new patients aged over 15 years with sputum smear-positive pulmonary TB, treated according to standard NTP treatment guidelines. The option of community-based DOT through an existing HIV/AIDS home care programme was offered in one compound and treatment outcomes were compared with a compound where ambulatory TB treatment was provided by health centre staff.

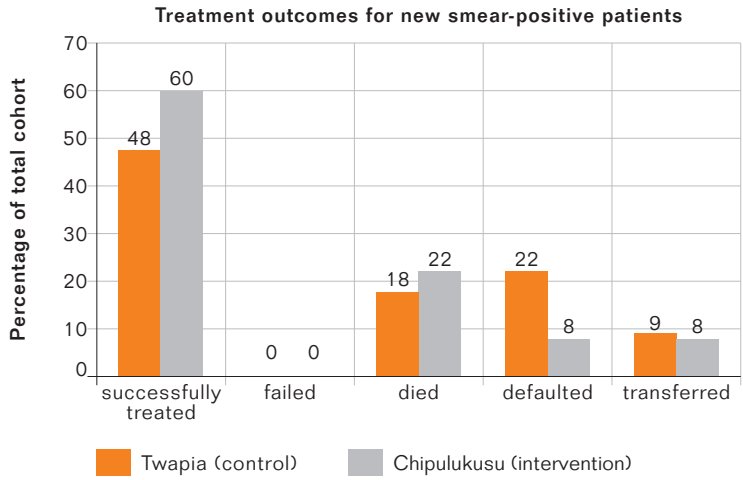
Findings: During the study period of 1998 and the first half of 1999, there were 104 new cases in the intervention compound Chipulukusu (72 smear positive) and 176 cases in the control compound Twapia (96 smear positive). Among new smear-positive cases, the treatment success rate was 61% in the intervention compound and 48.9% in the control compound. The default rate was 8.3% in the intervention compound and 22.9% in the control compound. There was a gradual and increasing acceptance of the role of community volunteers in providing DOT.

Conclusions: Integration of TB care into an existing home-based HIV/AIDS programme in this setting was successful, with improved treatment outcomes.

See Annex 2 for detailed data from this project.

(Miti S, Mfungwe V, Reijer P, Maher D. Integration of TB treatment in a community-based home care programme for persons living with HIV/AIDS in Ndola, Zambia. International Journal of TB and Lung Disease. In press.)

GRAPH SUMMARISING TREATMENT OUTCOMES FOR NEW SPUTUM SMEAR-POSITIVE PTB PATIENTS IN NDOLA, ZAMBIA



3.3.6 GUGULETU, SOUTH AFRICA

Setting: Guguletu and Nyanga (low income, high density, urban settlements in Cape Town, South Africa). South Africa has one of the highest TB incidence rates in the world, and the performance of the NTP has been disappointing. Ambulatory TB care, from a wide network of primary care clinics, has been provided in Cape Town for many years. Despite this, treatment outcomes have been sub-optimal. HIV prevalence among TB patients in Cape Town was 18% in 1999. In an attempt to improve outcomes, and in anticipation of rising TB case rates due to the HIV epidemic, the Cape Town TB programme decided to test the impact of adding DOT by community volunteers to the existing DOT options. The population of Guguletu and Nyanga is 215,000. DOT by community volunteers is organised through a local NGO. The drug regimen used is 2RZH/4HR for new patients.

Objectives: To determine the effectiveness, cost and cost-effectiveness of providing DOT by community volunteers as an option in the TB programme.

Design: From 1998 to 1999 TB programme performance was compared in Guguletu (which included the option of community DOT by community health workers) with Nyanga (without this option). Costs were assessed from a societal perspective in 1997 US$, and cost-effectiveness was calculated as the cost per patient successfully treated.

Findings: For smear-positive patients, cure rates were higher in the intervention area than in the control area, for new cases (58% vs. 50%) and for retreatment cases (47% vs. 35%).

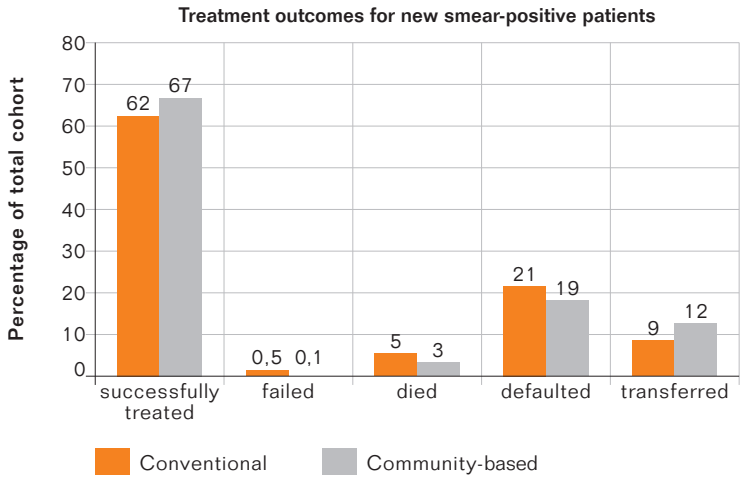
Treatment success rates for smear-positive cases were 67% in the intervention area and 62% in the control area. Death, transfer and interruption rates were similar in the two areas. 65% and 63% of smear negative and extrapulmonary cases respectively completed treatment in the intervention and control areas. In the intervention area 41% of patients chose community DOT. Treatment success rates were 81% among new smear positive patients who chose community DOT and 53% among those who chose clinic-based DOT in the intervention areas. TB treatment was more cost-effective (cost per patient successfully treated) in the intervention area than in the control area for both new (US$726 vs. US$1 201) and retreatment patients (US$1 419 vs. US$2 058). This reflected both lower costs (eg. US$495 vs. US$769 per patient treated for new cases) and better treatment outcomes. Within the intervention area, community-based care was more than twice as cost-effective as clinic-based care (US$392 vs. US$1 302 per patient successfully treated for new patients).

Conclusions: Community health worker DOT contributed to better TB control programme performance compared with an approach based exclusively on health facilities. Community involvement also improved the affordability and cost-effectiveness of TB treatment.

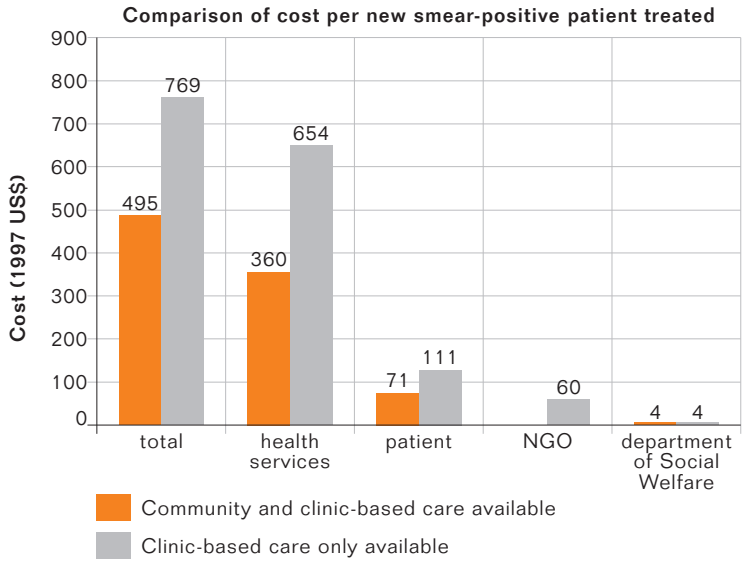
See Annex 2 for detailed data from this project.

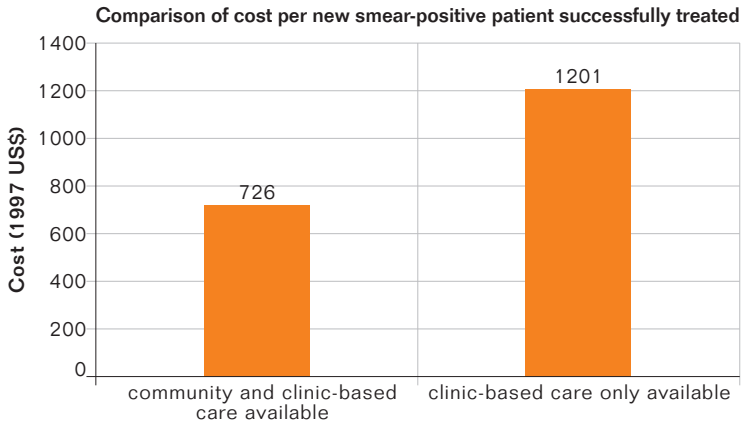
(*Dudley L, Azevedo V, Grant R, Schoeman JH, Dikweni L, Maher D. Evaluation of community contribution to TB care in Cape Town, South Africa. International Journal of TB and Lung Disease. In press.*)
(*Sinanovic E, Floyd K, Dudley L, Azevedo V, Grant R, Maher D. Cost and cost-effectiveness of community based care for TB patients in Cape Town, South Africa. International Journal of TB and Lung Disease. In press.*)

GRAPH SUMMARISING TREATMENT OUTCOMES FOR NEW SPUTUM SMEAR-POSITIVE PTB PATIENTS IN GUGULETU, CAPE TOWN, SOUTH AFRICA



GRAPH SUMMARISING COST AND COST-EFFECTIVENESS RESULTS FOR PROJECT IN CAPE TOWN, SOUTH AFRICA





3.3.7 HLABISA, SOUTH AFRICA

Setting: The rural health district of Hlabisa, KwaZulu-Natal, South Africa. The population of Hlabisa is approximately 250,000 and health care is provided through the district hospital, 12 community clinics, and a network of CHWs. Since 1991 the TB programme has been decentralised. Patients are admitted to hospital for no more than 2 weeks unless very sick. They then choose where to receive community-based DOT:

from community clinics, community health workers or a wide network of community volunteers (mainly storekeepers but also school teachers, clergy, and others). Treatment completion rates have been around 80-90%. The TB caseload in Hlabisa has increased from about 300 per year to over 1200 per year and in 1997 around 70% of TB patients were HIV-infected. With a rapidly increasing caseload the district programme was keen to determine whether traditional healers could effectively contribute to TB care.

Objectives: To assess the acceptability and effectiveness of traditional healers as supervisors of TB treatment in an existing DOTS programme.

Design: Comparison of treatment outcomes among new TB patients in the 3 intervention sub-districts who were offered the additional option of traditional healers for DOT supervision, with those in the remainder of the district offered the standard range of options for DOT supervision (health facility, community health worker and volunteers). A comparison was also made of treatment outcomes between different options for DOT supervision.

Results: In the intervention area, 47 patients (89%) supervised by traditional healers completed treatment, 3 (6%) died, 3 (6%) defaulted, and none transferred. In comparison, 157 patients (67%) supervised by others completed treatment, 4 (18%) died, 23 (10%) defaulted and 12 (5%) transferred. When comparing the intervention area to the remainder of the district, treatment completion and mortality rates were similar but patients in the intervention area were less likely to transfer out (4% vs. 22%). Interviews with 41 of 51 patients supervised by traditional healers indicated high levels of satisfaction. In the intervention area 12% of patients chose supervision by traditional healers, while 80% chose store-keepers, and 5% health clinics.

Conclusions: Traditional healers made an effective contribution to TB programme performance in this pilot scheme in Hlabisa district, but further careful assessment will be needed as the pilot is expanded across the district.

See Annex 2 for detailed data from this project.

(*Colvin M, Gumede L, Grimwade K, Maher D, Wilkinson D. Contribution of traditional healers to a rural TB programme in Hlabisa, South Africa. International Journal of TB and Lung Disease. In press.*)

Economic analysis of the Hlabisa TB control programme

Objectives: To conduct an economic evaluation of two alternative approaches to the management of new smear-positive adult TB patients.
Design: Community-based directly observed therapy, implemented in Hlabisa in 1991, was compared with a conventional hospital-based approach to TB treatment. Each was assessed in terms of cost, cost-effectiveness, and feasibility of implementation within existing resource constraints.
Interventions: Costs were established using cost and output data collected from hospital documents and relevant informants. This was combined with effectiveness data from Hlabisa (for the community-based DOT option), and from Malawi and Tanzania (for the traditional hospital and health facility-based option) to assess cost-effectiveness.
Results: Community-based DOT was 2.8 times cheaper overall compared with conventional treatment (US$740 vs US$2047 per patient treated). Community-based DOT was 2.4-4.2 times more cost-effective than conventional hospital-based TB management (US$ 890 per patient cured compared with US$2095-US$3700).
Conclusions: DOT is an attractive economic option in Hlabisa, being both low cost and cost-effective.

(*Floyd K, Wilkinson D, Gilks CF. Comparison of cost-effectiveness of directly observed treatment (DOT) and conventionally delivered treatment for TB: experience from rural South Africa. British Medical Journal 1997; 315: 1407-1411*).

3.3.8 Kampala, Uganda

Setting: The urban Kawempe Division of Kampala with a population of 150,000. The DOTS strategy was introduced in this area in 1997 with the TB register kept at the Kawempe Health Unit. The AIDS Support Organization (TASO), which provides HIV prevention and care activities, started working in Kawempe in 1998, aiming to mobilise community volunteers to contribute to TB control activities. All new sputum smear positive patients received 2HREZ/6EH. Under traditional hospital-based treatment, TB patients were admitted for 2 months intensive phase DOT, followed by monthly reporting to health units to collect drugs during the continuation phase. With the introduction of the option of community-based treatment in 1998, patients could have DOT throughout treatment at Kawempe Health Unit or start there while identifying a community volunteer who would continue DOT.
Objective: To evaluate the potential contribution to decentralised TB care by a non-governmental organization, (TASO).
Design: Comparison of treatment outcomes among patients choosing DOT in the initial phase of treatment at Kawempe Health Unit with those choosing community-based DOT.
Findings: Following the introduction of the option of community DOT about 8% of patients chose community volunteer DOT, 15% chose DOT at the health unit, and the rest stayed in hospital for DOT. Unfortunately, the TB recording and reporting system did not work well in Kawempe, and data on treatment outcomes for most patients were unavailable.

Conclusions: Acceptance of the community option for DOT was lower than expected in this setting. Outcomes from the project could not be reported due to less than ideal recording and reporting systems in the health unit.

(*World Health Organization. "Community TB care in Africa". Report on a "lessons learned" meeting in Harare, Zimbabwe, 27-29 September 2000. World Health Organization, Geneva, 2000*).

Why did this project site not achieve the desired success?

Some problems with community volunteers were identified, including poor motivation and fear of catching TB. Some TB patients complained about the stigma associated with TB/HIV and with receiving care provided through an organization strongly identified with HIV/AIDS care, long distances to the health unit, and poor education about DOT. Some TB patients expressed greater confidence in doctors than community volunteers and some received poor information from volunteers about DOT. Health workers were concerned about low staffing levels and the risks of catching TB, and some thought that community volunteers should be paid to make community-based DOT a success. The NTP found it difficult to interact with this poor, urban community and an opinion was expressed that there may be a lesser (or at least different) sense of community in some urban settings. However, as a result of the project there is now a better understanding and relationship between TASO and the NTP, and a greater awareness of TB within TASO.

3.4 Projects with technical support from WHO not falling under the "Community TB Care in Africa" Project

3.4.1 Kilombero, Tanzania

Setting: Kilombero has a population of 250,000. TB control programme performance in the area had deteriorated in the previous few years with a decrease in case notifications and cure rates, and an increase in default rates.
Objective: To determine the impact of the introduction of an option of community-based DOT on TB programme performance.
Design: Regimens used were 2RHZE/6HE for smear-positive cases, 2RHZ/6HE for smear negative cases and 2SHRZE/1HRZE/5HRE for retreatment cases. The 18 health units that provide TB treatment were paired, and the clinics in each pair were randomly allocated to offer community based DOT or to continue with DOT through the health unit. All seriously ill patients were admitted for the intensive phase. Community volunteers delivered community based DOT.
Findings: From January 1999 to June 2000, 617 patients were recruited in intervention areas and 1062 were recruited in control areas. Treatment success was higher in areas offering the choice of community-based DOT (63%) than in those offering DOT through the health unit (37%).

Conclusions: These preliminary results are encouraging and the project is exploring ways of ensuring that community volunteers can contribute to TB care in a sustainable way.

(*World Health Organization. "Community TB care in Africa". Report on a "lessons learned" meeting in Harare, Zimbabwe, 27-29 September 2000. World Health Organization, Geneva, 2000*).

3.4.2 Estie, Ethiopia

Setting: Ethiopia has a population of 63 million. The TB incidence is 117 per 100,000 per year and the DOTS strategy has been implemented across 65% of the population. Estie is a rural district in the north west of the country, with a population of 300,000, with one health centre and 10 health stations. Recognising problems with TB control, an attempt at improvement included the formation of TB clubs, comprising between 3 and 10 patients, who support each other's adherence, refer TB suspects to the health service, and link with other community members and groups. TB mahibers (local anti-TB associations) have developed from the TB clubs. TB mahibers are more formally involved in TB control, in liaison with the NTP.
Objective: To determine how TB mahibers have contributed to case finding and treatment outcomes.
Findings: The number of TB clubs reached 65 in 1999 and membership was 411. The number of TB mahibers increased from 2 in 1998 to 5 in 1999. The number of TB suspects referred reached 218 in 1999. Treatment success rates (cure plus treatment completion) for smear-positive PTB improved from less than 40% in 1996 to 80% in 1999. The defaulter rate fell from 32% in 1996 to 2% in 1999. The treatment completion rate for smear-negative and extrapulmonary TB was 75% in 1999.
Conclusions: TB clubs and TB mahibers have made a positive contribution to improved NTP performance at little cost to health services.

(*World Health Organization. "Community TB care in Africa'. Report on a "lessons learned" meeting in Harare, Zimbabwe, 27-29 September 2000. World Health Organization, Geneva, 2000*).
(*Getahun H, Maher D. Contribution of "TB clubs" to TB control in a rural district in Ethiopia. International Journal of TB and Lung Disease 2000; 4: 174-178*).

3.4.3 Five districts in Malawi

Setting: Five districts in Malawi using an oral anti-TB treatment regimen: four rural districts (Ntcheu, Zomba, Machinga and Salima) and one urban district (Lilongwe).
Objective: To determine whether ambulatory DOT during the initial phase of treatment supervised either in the hospital, at health centres or by guardians in the community is associated with satisfactory 2-month and 8-month treatment outcomes.
Design: Prospective data collection of all TB patients registered between July 1997

and December 1998, including 2-month and 8-month treatment outcomes, sputum smear conversion in smear-positive PTB patients and in-patient hospital bed days. All new patients with smear-positive PTB and serious forms of EPTB were given HRZE for two months under direct observation three times a week, followed by 6 months of daily self-administered isoniazid and ethambutol ($2R_3H_3Z_3E_3$ / 6HE). All new patients with smear-negative PTB and less serious forms of EPTB were given HRZE for two months under direct observation three times a week, followed by 6 months of daily self-administered isoniazid and ethambutol ($2R_3H_3Z_3$ / 6HE). In the rural districts patients were initially admitted to hospital for 15 days for intensive health education about the need to take all their medication under direct observation. Patients were allowed to go home after 15 days if fit enough and if able to continue their initial phase with DOT either as an out-patient at the TB ward, or at a health centre or by a guardian. In Lilongwe district patients were allowed to go home from the day of registration. In Ntcheu new patients were given the choice of DOT as a hospital inpatient, or as an outpatient at the TB ward, at a health centre or by a suitable guardian. In the other 4 districts, patients with smear negative PTB and EPTB were offered DOT at the TB ward, health centre or at home by a guardian. Ntcheu allowed guardian DOT for smear-positive PTB patients. A suitable guardian was defined as a literate member of the extended family, entrusted to supervise treatment at home and able to record drugs taken on DOT monitoring forms.

Results: 6335 new patients were registered: 2671 (42%) with smear-positive PTB, 2211 (35%) with smear-negative PTB and 1453 (23%) with extrapulmonary TB. 8-month treatment completion was 67% for smear-positive PTB patients, 51% for smear-negative PTB patients and 56% for extrapulmonary TB patients. The site of the initial phase of treatment was determined in 5790 patients: 1759 (30%) chose DOT by guardians, 1465 (25%) at a health centre, 753 (13%) as an out-patient at the hospital TB ward, and 1813 (32%) remained in hospital. 2-month and 8-month death rates were significantly higher in hospitalised patients. In Ntcheu, 131 (30%) of 428 new smear-positive PTB patients chose guardian-based treatment, and treatment completion was 74%, which is similar to that observed in health centre-based DOT. For new patients with sputum smear-positive pulmonary TB, treatment outcomes according to all outpatient sites of supervision were satisfactory except for a higher proportion of smear-positive PTB patients under guardian DOT failing to smear convert at 2 months. For the five districts together, treatment outcomes of patients with new sputum smear-negative pulmonary TB were similar to those observed using health centre and hospital OPD supervision, except there was a higher proportion using guardian-based treatment with an unknown treatment outcome (14%). This reflects the loss of treatment cards by some of the smear negative patients who opted for guardian-based treatment.

Conclusion: The new treatment approach in 5 pilot districts is associated with satisfactory treatment outcomes, and with some modifications is now being expanded country-wide in a phased approach.

See Annex 2 for detailed data from this project.

Banerjee A, Harries AD, Mphasa N, Nyirenda TE, Veen J, Ringdal T, van Gorkom J, Salaniponi FML. Evaluation of a unified treatment regimen for all new cases of TB using guardian based supervision. International Journal of TB and Lung Disease 2000; 333-339.

Manders AJE, Banerjee A, van den Borne HW, Harries AD, Kok GJ, Salaniponi FML. Can guardians supervise TB treatment as well as health workers? A study on adherence during the intensive phase. International Journal of TB and Lung Disease 2001; 5: 838-842.

TABLE 3 SUMMARY OF "COMMUNITY TB CARE IN AFRICA" PROJECT SITE CHARACTERISTICS

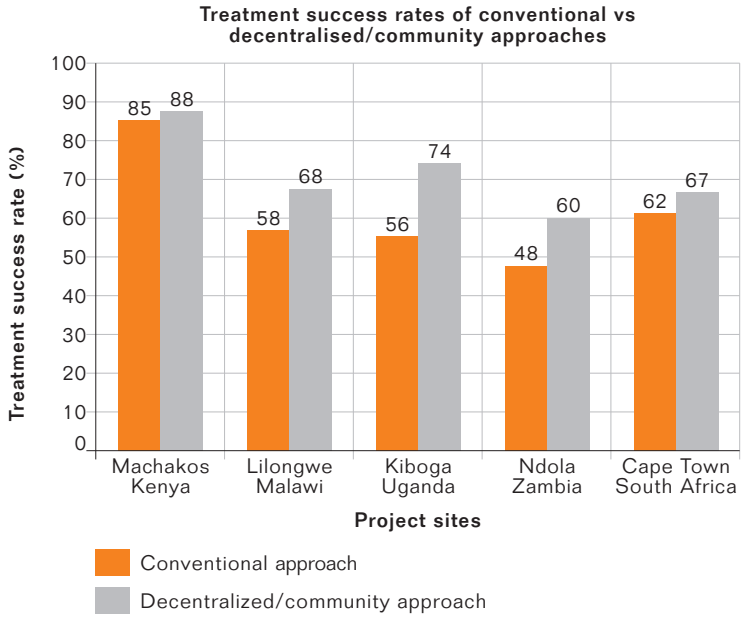
Country	Project site	Setting	Type of study	Community organization/volunteers
Botswana	Francistown	Urban	Historical comparison within the same district	HIV/AIDS home care programme
Kenya	Machakos	Rural	Historical comparison within the same district	PHC volunteers and community-based distributors of contraceptives
Malawi	Lilongwe	Urban	Historical comparison within the same district	Guardians and community workers
Uganda	Kiboga	Rural	Historical comparison within the same district	Parish development committee
Zambia	Ndola	Urban	Prospective comparison between two different "compounds"	Church NGO HIV/AIDS home care programme
South Africa	Guguletu, Cape Town	Urban	Prospective comparison between two different districts	TB NGO
South Africa	Hlabisa, KwaZulu/ Natal	Rural	Prospective comparison between one part of a district and the rest of the district	Traditional healers
Uganda	Kampala	Urban	Prospective comparison between patients choosing different DOT options within Kawempe Division	HIV/AIDS prevention and care programme

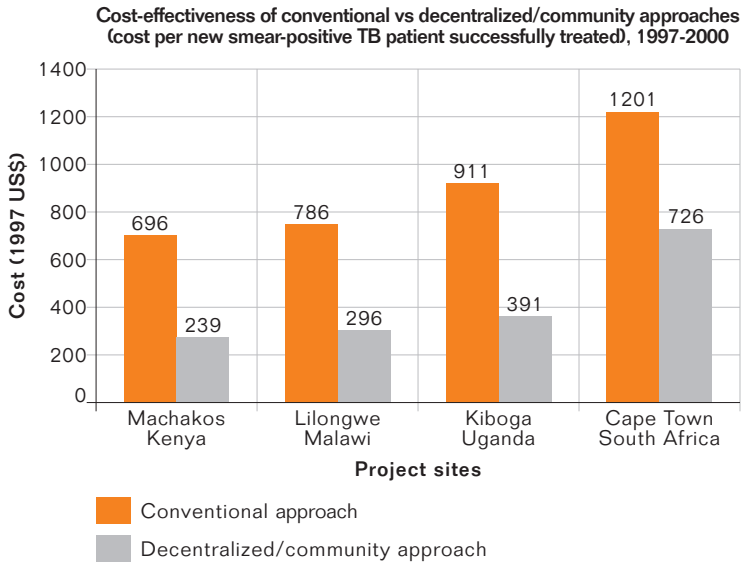
TABLE 4 SUMMARY OF "COMMUNITY TB CARE IN AFRICA" PROJECT SITE RESULTS

Country	Project site	Number of patients (intervention vs. control)	Effectiveness (intervention vs. control) 1) length of hospital stay (days) 2) treatment success or adherence rates	Cost per patient treated in US$ intervention vs. control (reduction %)	Improvement in cost-effectiveness with community DOT (%)
Botswana	Francistown	50 vs. 50	1) 21 vs. 93 2) 96% vs. 100% (adherence)	1657 vs. 2970 (44%)	42%
Kenya	Machakos	3244 vs. 1141	1) 4 vs. 60 2) 88% vs. 85% (treatment success)	209 vs. 591 (68%)	66%
Malawi	Lilongwe	3761 vs. 3144	1) 16 vs. 58 2) 66% vs 60% (treatment success)	201 vs. 456 (56%)	62%
Uganda	Kiboga	450 vs. 540	1) 19 vs. 60 2) 74% vs. 56% (treatment success)	289 vs. 510 (43%)	57%
Zambia	Ndola	72 vs. 96	1) n/a 2) 61% vs. 49% (treatment success)	n/a	n/a
South Africa	Guguletu, Cape Town	2873 vs.1069	1) n/a 2) 67% vs. 62% (treatment success)	495 vs. 769 (36%)	40%
South Africa	Hlabisa, KwaZulu/Natal	53 vs. 364	1) n/a 2) 89% vs. 67% (adherence)	n/a	n/a
Uganda	Kampala	n/a	n/a	n/a	n/a

Number of patients refers to all patients included in the trial and the evaluation.
Effectiveness usually measured as treatment success (cure plus completion of treatment) among smear positive cases.
Cost effectiveness usually defined as cost per smear positive patient successfully treated, but see text for details of individual projects.
n/a – not available or not applicable.

Summary graphs of community TB care in Africa project site results (treatment success and cost-effectiveness)





3.5 Expansion beyond project sites

The "Community TB Care in Africa" project has been very well received in the districts and the countries where it was implemented. Several host countries have started a process of expanded implementation across other districts, as described below.

Botswana

The Botswana government has allocated a substantial amount of money to implement a national programme of home-based care (HBC) primarily for patients with advanced AIDS. Funding includes support for transport, supportive HBC nurses to train carers and visit households, drugs, gloves, and other supplies and materials. The pilot project in Francistown demonstrated that a trained family carer could deliver DOT as effectively as the health care system. Peripheral health clinics, which are highly accessible, will continue to play the primary role for delivery of DOT. The Francistown data and experience will be further disseminated to the National AIDS Control Programme, National AIDS Coordinating Agency, and the Ministry of Local Government to advocate DOT at home by a carer for TB patients with advanced AIDS.

South Africa (Cape Town)

Results of the successful Guguletu project have been disseminated both locally and internationally at scientific conferences. Within the Cape Town metropolitan area itself there are now an estimated 370 TB treatment supporters for 1669 TB patients, which is well below the maximum coverage of 10 patients per treatment supporter. The treatment supporters are provided with a cash incentive based on the number of patients being supported per month. Because of high unemployment rates, monetary incentives have been the most appropriate here, though other incentives may apply in different settings.

This model is already being disseminated nationwide through a government contract to a TB NGO known as TADSO, which has worked with at least 1 district in 8 of the 9 provinces in South Africa to adapt the model to local circumstances. Adaptation of any model in this manner while retaining the essential elements of TB care is crucial. Implementation guidelines have been developed to help retain basic principles. Key elements for successful implementation include the use of standardized training tools and ongoing monitoring and evaluation of service provision by TB treatment supporters. Ongoing training and support to health staff, DOT coordinators, and TB treatment supporters provides encouragement and increases motivation.

South Africa (Hlabisa)

A community-based DOT programme has been in place since 1991 *(Wilkinson D. High-compliance TB treatment programme in a rural community. Lancet 1994; 343: 647-648).* A small number of very sick patients remain in hospital for most or all their treatment, while others are supervised through a network of village clinics, with more supervised by community health workers, storekeepers and other lay volunteers.

The option of using a traditional healer for treatment supervision is now being added to the programme.

(Wilkinson D. Gcabashe L, Lurie M. Traditional healers as TB treatment supervisors: precedent and potential. International Journal of TB and Lung Disease 1999; 3: 838-842).

Many patients first consult a traditional healer for care so their involvement in TB care could significantly enhance case finding and successful treatment outcomes. The traditional healers are organised into an association that facilitates communication and planning for rollout once the pilot study is completed. The healers are enthusiastic about playing a greater role in health care provision in the area and being further integrated into health service delivery in the community.

The existing monitoring and evaluation system for community-based DOT will be used during the rollout to traditional healers. Traditional healers will be visited monthly by a field worker to review the treatment card held by the traditional healer and the patient's drug supply. The current practice is for the field worker to deliver the full 6-month drug supply to the TB treatment supporter responsible for DOT. No large financial commitment will be required for the rollout of the programme since an existing community TB care structure exists and the main thrust of the project is to add an additional DOT option.

Machakos, Kenya

Community TB care will be expanded beyond Machakos to other primarily rural districts in Kenya based on the following criteria: limited accessibility to TB health services in the community; high TB case load and HIV prevalence; community health structures in place; and poor TB performance indicators. The TB programme extended community TB care to Kitui district in 2001, and the NTP is committed to continued stepwise rollout to other districts. Streptomycin has been replaced with ethambutol nationwide, information and education materials have been developed, microscopy centres have been expanded and improved, and the central referral laboratory is being upgraded to improve drug susceptibility testing. The district TB coordinator will increase supervisory visits to DOT providers from once every three months to monthly. Districts are already equipped with paid field health educators who are the coordinators and supervisors of CHWs who support TB patients, including directly observing their treatment, in addition to their other services and care.

Uganda

Uganda has made significant progress in expanding community TB care, with 30 out of 56 districts making the option of community DOT available by 2002. A number of steps were involved, starting with advocacy. This included briefing the Health Minister and senior officials in the Ministry of Health, and ensuring that community care was a theme for World TB Day. Scaling-up followed as part of broader health sector reform. Indeed the success of the Kiboga project in harnessing the community contribution to TB care played a part in positioning the NTP as a pathfinder for broad health sector

reforms of decentralisation and community participation. Community DOT is part of the Ministry of Health strategic plan for 2001-2005.

Malawi

TB care in Malawi has been decentralised to 5 districts in the country. The first district was Ntcheu, chosen because of its good TB performance and because of close access to the central unit in Lilongwe. The next was Lilongwe (the urban district in Malawi that includes the capital city). Then came Salima, Machinga and Zomba, chosen on geographical grounds and also because of reasonable access to the central unit.

There are some variations in practice from district to district. Lilongwe offers community based options from the first day while the other districts hospitalise patients for the first 2 weeks followed by community-based options. In Ntcheu, guardian based treatment is offered to all TB patients while in the other districts it is only offered to patients with smear negative TB and extrapulmonary TB.

(*Salaniponi FM, Gausi F, Mphasa N, Nyirenda TE, Kwanjana JH, Harries AD. Decentralisation of treatment for patients with TB in Malawi: moving from research to policy and practice. International Journal of TB and Lung Disease. In press.*)

REVIEW OF COMMUNITY CONTRIBUTION TO TB CARE IN ASIA

This chapter summarises a review of community contribution to TB care in Asia. WHO commissioned reviews of community contribution to TB care in Asia and Latin America, to complement the experience of community contribution to TB care in sub-Saharan Africa. WHO will revise and expand the documentation of experiences of community contribution to TB care as these and other regions report further experience.

4.1 Background

WHO commissioned a review of community contribution to TB care in Asia in 2000, comprising a literature search and visits to selected community TB care projects in Bangladesh (2 sites) and India (3 sites). Historically, TB control efforts in much of Asia were centred on curative services delivered through a limited number of specialised institutions in urban centres. This approach was associated with limited success and NTPs are now more typically integrated with general health services. However, since even this does not ensure access for the whole population, additional strategies are needed. The potential for community contribution to TB care in Asia is high because of the long history of community involvement generally in primary health care.

4.1.1 Bangladesh

With a population of about 128 million, Bangladesh is divided into 6 divisions, 64 districts and 497 sub-districts, called Thanas. Up to 98% of the population speak Bengali and 86% are Islamic. Bangladesh is mainly rural (82% of the population) and 64% of the population is directly involved in agriculture. Only about 47% are literate, gross national income per capita is low ($US277), and about half of all households live in poverty. Key health indicators are less than satisfactory. For example, infant mortality is 728 per 1000 live births, life expectancy is around 59 years, and around 60% of the population have little or no access to basic health services.

The incidence of new smear positive cases of TB in 1996 was estimated at 111 per 100,000 population, with a caseload of over 300,000. There were estimated to be 60,000 deaths due to TB in 1999. With the risk of an expanding HIV epidemic, a further increase in caseload is expected. Starting in the 1980s, with foreign support, a series of population and health projects have worked to develop and integrate health services across the country. In the current Health and Population Sector Programme major initiatives include a sector wide approach to deliver an Essential Services Package targeted at the most vulnerable groups in the population.

Up until 1980 TB services were provided through TB clinics and hospitals. Since then, services were expanded to 124 Thana Health Complexes. However, due to low levels

of access and limited service development the NTP has had limited success. A 1990 study by the World Bank reported that less than 50% of TB patients were completing treatment and less than 20% of estimated cases were detected. DOTS was implemented in 1993 and by 1998 had reached most Thanas.

4.1.2 India

India has a population of around 900 million people. The country is divided into 32 States and Union Territories, which are further divided into more than 550 districts, and district populations range from less than 100,000 to 9.5 million. About 84% of Indians are Hindu and the population is predominantly rural. Around 64% of the population is directly involved in agriculture and the gross national income per capita is US$430.The infant mortality rate is around 72 per 100 live births.

The burden of TB in India is enormous: an estimated 2 million people develop TB and 450,000 die from it every year. The NTP was formed in 1962 with District TB Centres established in most districts, in addition to 330 Chest Clinics in urban areas. The NTP is integrated with general health services through a network of Primary Health Centres. By 1997 short course chemotherapy had been introduced in about two-thirds of the districts. Treatment has been delivered via the health centres, but due to poor data the programme results cannot be clearly defined. It is however estimated that the NTP reached 50% of cases and cured 30% of them. DOTS was implemented in 1993 and expanded thereafter with large-scale implementation in 1998. Cure rates are now reported to be 70-80%.

4.2 Literature review

A literature search with key words "community AND TB" was done using MEDLINE. Contact was made with experts in the field to try and identify unpublished reports. The published literature on community based TB services in Asian countries is limited. However, some papers do document varied experience with community-based TB care in Asia in the last 20 years (Table 5). Common features of these studies are the high levels of acceptability of community involvement, and treatment outcomes that are better than those achieved by NTPs alone.

Table 5 SUMMARY OF FINDINGS FROM LITERATURE REVIEW OF COMMUNITY CONTRIBUTIONS TO TB CARE IN ASIA

Year (ref)	Setting	Coverage	Community involved	Components of care provided	Effectiveness
1982 (1)	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 (2)	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 (3)	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 (4)	Slum areas in Ahemadabad city, India		Community health workers	Identification of possible cases, patient motivation, DOT	382 possible cases identified in 4 years Cure rate 82% - 93%
1997 (5)	4 rural community demonstration centres, Nepal		Social workers and community workers	DOT and defaulter tracing	85% cure rate
1990 (6)	Urban and rural settings, Philippines		Lay and church group volunteers	DOT	80-90% cure rates
1991 (7)	Rural Thanas in Bangladesh		Community health workers	Identification of possible cases; referral; DOT; drug distribution; defaulter tracing; health education	Cure rate 66%
1996 (8)	Rural and urban provinces, China		Village doctors	DOT	80-90% cure rates
1997 (9)	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

References for Table 5

1 *Balasubramanian R, K Sadacharam, et al. Feasibility of involving tribal youths in TB case-finding in a tribal area in Tamil Nadu. Tubercle and Lung Disease 1995, 76; 355-359*

2 *Rajeswari. R, K.Chandrasekharan, et al. Study of the feasibility of involving male student volunteers in case holding in an urban TB programmeme. International Journal of TB and Lung Disease 1997 1(5); 573-575*

3 *Balasubramanian R Feasibility of utilizing traditional birth attendants in DTP. Indian Journal of TB 1997, 44;133*

4 *Mirai Chatarjee, Shobha Dantani, Sweta Kohli. TB control- the experience of the SEWA, WHO workshop on TB control, ASCI, Hyderabad, 1997, 1-10*

5 *Malla P, Bam D, Sharma N. Preliminary report of four demonstration DOTS treatment centres in Nepal. International Journal of TB and Lung Disease 1997, 1; S69.*

6 *Manalo F, Tan F Sbarbaro J A, Iseman M D. Community based short-course treatment of pulmonary TB in a developing nation: initial report of an eight month largely intermittent regimen in a population with a high prevalence of drug resistance. American Review of Respiratory Disease 1990, 142: 1301-1305.*

7 *Chowdhury A M R, Ishikawa N, Islam S A et al. Controlling a forgotten disease: using a voluntary health workers for TB control in rural Bangladesh, 1991, IUATLD News Letter, December.*

8 *China TB Control Collaboration. Results of directly observed short-course chemotherapy in 112842 Chinese patients with smear positive TB, Lancet 1996, 10; 358-362.*

9 *Chowdhury A M R, Chowdhury S, Islam MN, et al. Control of tuberculosis by community health workers in Bangladesh. Lancet 1997; 350: 169-72.*

4.3 Site visits

Sites were selected in consultation with local WHO South-East Asia Regional Office (SEARO) officials to represent a mix of urban and rural settings where NGOs are implementing the DOTS strategy for TB control.

4.3.1 Features of NGOs visited (Tables 6 and 7)

SEWA (Self Employed Women's Association), Gujarat, India.
Members are workers who have no fixed employee-employer relationship and who work for themselves, such as hawkers, vendors and those engaged in related small businesses; home based workers including weavers, potters, artisans and processors of agricultural products; and manual labourers and service providers such as agricultural workers, construction workers, contract labourers, and domestic workers. Starting in Ahemadabad city three decades ago, they expanded across Gujarat. The association aims to "organise the workers for full employment and self reliance", and is an organization and women's cooperative movement. SEWA's activities include income generation and improvement of incomes by improving marketing and management skills and providing capital and credit; social security (provision of health care, housing, child care and insurance); and campaigning for workers rights. Local health cooperatives have been formed by SEWA and women trained as community health workers are paid a modest amount for services provided.

BRAC (Bangladesh Rural Advance Committee), Bangladesh.
BRAC was formed in 1972 principally to provide relief and rehabilitation in Sylhet district to thousands of refugees returning to their home after the war of independence. A year later the organization shifted its focus to long-term community development and BRAC adopted a targeted group approach focussing on the landless and manual labourers. It is committed to the reduction of poverty and the empowerment of these sections of the population, and BRAC has specifically targeted women in its programmes. A holistic approach is taken, with interventions for economic development, improving health status and education simultaneously planned and implemented. The rural development programme addresses the socio-economic development of underprivileged rural women through access to credit, capacity development and mobilisation of savings, institution building and awareness raising. The Health, Nutrition, and Population Programme (HNPP) addresses the health and nutritional status of children and women and the basic unit at which activities are organised is the village organization.

The HNPP of BRAC has two components. One is an integrated and comprehensive set of health interventions for poor people living in programme areas and the other is technical assistance and support to national programmes. The disease control programme includes the community-based TB control activities. Most interventions are through community-based health workers who are trained for their respective roles and closely monitored by the BRAC community health organizers who are in turn supervised by Programme Organizers and other staff. BRAC also runs health centres staffed by a Medical Officer and other staff. BRAC currently covers over 50,000 villages and employs over 20,000 full time staff and 33,000 part time staff.

HEED (Health, Education, and Economic Development), Bangladesh
HEED started in 1972 with the work of members of the Christian community who offered their services in medical and nursing care. From Dhaka, services have expanded across the country. At government request HEED agreed to take on leprosy control activities that have expanded into an integrated Leprosy and TB Control Programme (LTCP). The LTCP now covers 750,000 people. HEED has expanded its activities to include broader community development aimed at increasing income levels and empowerment. After the launch of the revised NTP using DOTS, HEED agreed to partner the NTP in 25 Thanas in 3 districts.

ACT (Advocacy for Control of TB), Chennai, India
ACT is a project of a registered society called REACH (Resource Group for Education and Advocacy for Community Health) in Chennai, Tamilnadu, India. ACT is a community initiative to highlight the need for TB control, based upon the DOTS strategy. ACT links patients with private practitioners in Chennai, identifies community DOT volunteers, registers laboratories for training in sputum microscopy, organises clinical meetings, and raises public awareness through the media.

Table 6. Characteristics of NGO project areas visited in India and Bangladesh

Project	Population covered	Profile
SEWA	270,000 in 2 urban slums	95% Hindus 15% - 20% migrants from other states 85% - 90% daily wage labourers or self-employed Literacy rate 25% - 30% Annual income per capita less than US$390
BRAC	714,000 in 2 rural Thanas	Rural population 98% - 99% Moslem Agriculture primary occupation for 80% Literacy rate 30% Annual income per capita less than US$435
HEED	218,000 in 1 Thana	90% rural population 80% Moslem population Literacy rate 30% Annual income per capita less than US$435
ACT	4.5 million Chennai, India	Urban Literacy rate around 65% Varied occupations and income levels
Khenjohar	1.4 million in 1 district	Rural Predominantly Hindu Literacy rate around 30% Primary occupation is agriculture for 80%

4.3.2 Findings from site visits (Table 7)

Community involvement
Key features of the justification for substantial community involvement in TB care in Asia include limited coverage by government health services in some areas and the need to increase access to health care for the large and dispersed population, and the availability of strong and established NGOs in many parts of the region with effective primary health care

programmes that can be expanded to include TB care. For example, BRAC has substantial experience in the successful mobilisation of community groups and the development of strong community-based rural development programmes. The existing HNPP has trained community health workers in each village, providing an opportunity to integrate TB services. Additional infrastructure and supervisory staff are also available to support this.

HEED has chosen specific Thanas for implementing a community-based TB programme, based upon existing community-based Leprosy Control Programmes and its experiences in successful mobilisation of women's groups for thrift and micro-credit activities. Initiatives in India have included involvement of Anganwadi Workers in the Integrated Child Development Scheme projects in rural villages in TB control. In Madras the ACT NGO project mobilised private medical practitioners and other volunteers to become involved in TB care.

Components of care

An important feature of health care in Bangladesh is the direct involvement of many NGOs. While some of these provide health services only, others include health services as part of more comprehensive rural development programmes. The government of Bangladesh is keen to facilitate this collaboration as a way of increasing geographical and population coverage of its health programmes. TB and leprosy activities were integrated in 1986 and some NGOs have pursued innovative approaches to TB control. Since the introduction of DOTS, NGOs are involved in delivering community TB care in about half of all Thanas.

The components of care provided in the various programmes vary substantially. In some, such as BRAC, SEWA and HEED the NGOs have been given complete responsibility for implementation of the NTP. In others, such as Khenjohar, services are limited to case finding, referral and DOT. The ACT project in Chennai City, India restricts itself to organising DOT and default retrieval. In the larger programmes that essentially act as part of the NTP, high-level technical staff such as microscopists may be employed, such as in the SEWA project. In HEED projects in Bangladesh TB and Leprosy Control Assistants (TLCA) were appointed by the NGO to assist the government programme. Trained CHWs who work full time manage sputum collection centres in SEWA projects.

Activities such as health education, case finding, community DOT and defaulter retrieval are done by the CHWs present in each of the villages in the BRAC projects. In the Thanas managed by HEED, these activities are performed by the TLCAs. TLCAs support TB patients, including directly observing their treatment, only at the health centre (usually the first dose of the week) and remaining doses are taken at home, supervised by a family member. In Khenjohar, and other projects, a variety of community based health workers or volunteers support TB patients, including directly observing their treatment.

Process of selection of community-based workers

Typically, community-based health workers and volunteers are selected by their community through a fairly formal selection process, often in consultation with local health workers. Many of those selected have taken part in various primary health care or community development activities in the past, and have demonstrated their interest, commitment and ability. BRAC programme organisers visit villages and encourage

development of a village organization (1 for every 40-50 households) that then selects the community health worker for training. Duties of the community health workers typically include health education, immunisation, treatment of simple diseases, referral of complicated cases, and safe delivery. In the ACT project in Chennai, the patients, in consultation with private medical practitioners and NGO social workers, identify DOT volunteers.

Training community-based health workers

The level of training provided varies substantially from seven weeks formal training for BRAC CHWs, to no formal training for DOT supervisors in the ACT project in Chennai. In between these 2 extremes, TB workers may receive 2-5 days initial training with occasional refreshers and on the job support and supervision. The amount and level of training is largely determined by the role the health workers will play. As noted above, many play a broad role in the primary health care system, while others focus on one aspect of TB care only.

Supervision

In larger programmes, such as BRAC, there is a well-defined and well-run system of supervision at various levels, which includes BRAC and government officers. Other programmes such as SEWA use less formal systems where, for example, laboratory assistants visit selected DOT providers each afternoon to audit activity. Those projects, linked to formal health services, usually include reporting to and supervision from these services.

Incentives

Incentives and rewards also vary across the programmes and projects. Some participants in, for example, the SEWA projects receive no extra payments for involvement in TB care. Many volunteers seem to provide their time willingly and see it as their contribution to society, receiving spiritual reward. In some programmes health workers earn modest amounts from their activity, which may include a part of any amount paid as a deposit by a patient at the start of treatment. Others are paid a modest salary for their broader role that includes TB care.

TABLE 7. COMPONENTS OF COMMUNITY TB CARE PROVIDED THROUGH THE DIFFERENT NGO PROJECTS VISITED IN INDIA AND BANGLADESH

Service	Project				
	BRAC	HEED	SEWA	KHENJOHAR	ACT
Information and education relating to TB	By community workers during routine visits	By community workers/ coordinators during routine visits	By community workers during routine visits and through various meetings	By community workers during routine visits and through various meetings	N/a
Identification of people with symptoms	By community workers during routine visits, and by medical officers on referral to clinic	By community workers during routine visits	By community workers during routine visits and during various meetings and visits to clinics	By community workers during routine visits and through informal inquires with members of the community	By community workers during routine visits
Treatment initiation	By community workers at home after introduction of the patient from clinic and on execution of a bond by the patient for completion of treatment with community members as witness and payment of deposit	By community workers soon after the diagnosis at the health centre	At the residence of the DOT volunteer after formal introduction by SEWA staff	At the residence of the community workers after communication of diagnosis and treatment prescribed at health clinic or by health worker	At the residence or work place of the DOT volunteer after formal introduction and brief training by the ACT social worker
DOT	At the community workers residence with flexible timings	At the health centre with no flexibility regarding time and place	Mostly at the residence of the DOT volunteer	Mostly at the community workers residence or work place with flexible timing and option to administer at the patients residence	Strictly at the residence or work place of the DOT volunteer with set times if at work place
Default retrieval	Counselling by BRAC health staff	Counselling of patient and family members	Counselling of patient and family members	Counselling of patient and family members; mobilisation of community; informal sanctions	Counselling of patient and family members

4.3.3 Case-finding and treatment outcome results

BRAC

Community health worker activity seems largely acceptable to community members, patients and public health workers, despite some early resistance especially from elderly people, related to gender and religious issues. Coverage has extended to 11 Thanas covering 1.8 million people in 1992. Cure rates of 85-90% are regularly achieved in BRAC project areas, compared with around 80% for the NTP outside these areas. The default rate is substantially lower in BRAC areas.

(Mushtaque A, Chowdhury R, Chowdhury S, Nazrul Islam M, Islam A, Vaughan JP. Control of TB by community health workers in Bangladesh. Lancet 1997; 350: 169-172).

SEWA

While similar numbers of patients have chosen supervision from health units and from community workers, it seems that several patients prefer not to be supervised locally. This seems to be related to a desire (particularly among women) to keep their illness secret, belief that health workers at the health centre are more qualified and educated and so will be able to provide better services, assumption that they have to adjust to the convenience of the DOT provider, and conviction that community volunteers have less accountability and problems of social access linked to local dialects. Case detection and cure rates have gradually increased with the defaulter rate less than 10% during 1993-96.

Initially there seemed to be some resistance to the role played by community health workers among some government health workers. Concerns raised seemed to be more potential (lack of education about how to identify side effects) than real. Community members are generally accepting of community based TB care and many believe it encourages adherence. Cure rates are around 40-50%.

HEED

Cure and treatment success rates of about 80% are achieved in the HEED project areas and in NTP areas outside these areas.

Khenjohar

Services rendered by the Anganwadi workers seem generally acceptable to patients as costs are reduced, and they may be more understanding and flexible than health unit staff. However not all the services were acceptable to health staff. About 40% believe that Anganwadi workers do not possess the minimum education and skills needed for record keeping and recognition of side effects. Some thought that Anganwadi workers

would be under pressure (as local people) to allow too many concessions, reducing the impact of DOT. However, cure rates of 85-90% are reported.

ACT

Acceptability is high as patients identify volunteers. The project has enlisted 37 private doctors as DOT providers, and has created several links with local hospitals, laboratories and private industry. In all, ACT has registered 230 patients for DOT.

4.3.4 Summary and key messages

The review reported a high level of community involvement in TB care in India and Bangladesh. This seems to be built upon the high levels of direct community involvement in community development and primary health care in these settings. The extension of this activity into TB care is logical. There is a wide range of types of involvement. At one extreme, large NGOs provide all TB care (under franchise from the NTP) in a large geographical area and for a large population, utilising a community-based approach to delivery of TB care. At the other extreme, there are smaller, innovative projects seeking to establish new ways of delivering TB care in the community. As documented here, several of these programmes are achieving high quality outcomes.

Key messages

- There is a high level of community involvement in TB care in India and Bangladesh
- There is a wide range of types of involvement ranging from providing all TB care under franchise from the NTP in a large area to small, innovative projects
- This involvement builds on historically high levels of direct community involvement in community development and primary health care in these settings
- Several community care programmes and initiatives are achieving very high quality outcomes

Further reading

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REVIEW OF COMMUNITY CONTRIBUTION TO TB CARE IN LATIN AMERICA

This chapter summarises a review of community contribution to TB care in Latin America. WHO commissioned reviews of community contribution to TB care in Latin America and Asia, to complement the experience of community contribution to TB care in sub-Saharan Africa. WHO will revise and expand the documentation of experiences of community contribution to TB care as these and other regions report further experience.

5.1 Background

This review of community contribution to TB care in Latin America comprised a literature search and visits to selected community TB care projects in Bolivia and Colombia.

Latin America comprises 21 countries, and most share the same religion (Roman Catholic) and language (Spanish), with exceptions such as Brazil where Portuguese is spoken, and small indigenous communities where local dialects are spoken. The ethnic background of most people in the region is the result of the mixing between indigenous people, Africans, and Europeans. The economy remains largely dependent on agriculture and exports of natural resources, with some countries (e.g. Mexico, Brazil, Venezuela, Peru, Chile, Argentina and Colombia) also undergoing substantial industrialisation. Parliamentary democracy has become more common in the last decade. The health care system infrastructure varies substantially across the region. Whilst many countries have relatively good public health care infrastructure and some boast modern health care technology, others are relatively underdeveloped.

The Americas Region contributes 9% of the estimated global caseload of new sputum smear-positive pulmonary TB. High prevalence countries include Haiti, Peru and Bolivia, with notification rates of up to 111 per 100,000 population per year. DOTS is being implemented progressively across the region, with well-documented and successful programmes in Peru, for example. In Latin America HIV prevalence is comparatively low and has not led to an increased TB caseload that threatens NTP performance, as it has in Africa.

There is substantial evidence of effective community participation in health care in general, in several countries of this region, particularly in the control of diseases transmitted by vectors. It seems that such community involvement has been driven both by the need to supplement relatively weak governmental responses to diseases, and by the arrival of foreign-supported NGOs that promote community participation in health care as a core principle, as, for example, in Bolivia.

5.1.1 Bolivia

The two sites visited in Bolivia were Montero and Oruro. Montero, in the Department of Santa Cruz, is a town of 61,000 people. The region has a booming economy and there has been an influx of immigrants recently. Around 60% of the population is urban and of low income. Oruro, the capital of the Department of Oruro, has around 390,000 people and mining is the main economic activity. Around 55% of the population is urban, with the rural population widely spread across a large area, and with access to heath care difficult.

5.1.2 Colombia

The three sites visited in Colombia were Barranquilla, Popayan, and Toribio. Barranquilla is a city of 1 million people, the capital of the Department of Atlantico. Approximately 30% of Colombian imports and exports go through this port situated in the Colombian Caribbean. Around 90% of the population is urban, and a third is of low income. Popayan is a city of 221,000 people and is capital of the Department of Cauca. The economy is based on agriculture and related services and 90% of the population is urban. Toribio is a town of 28,000 people, in the Department of Cauca. Approximately 90% of the population consists of indigenous people living in very poor conditions with many basic needs unmet.

5.2 Literature review

A literature search with key words "community AND Tuberculosis" was done in 2000 using MEDLINE and LILACS-BIREME (a database specializing in health literature produced in the Americas) and databases held by national science and technology offices. NTP officers were also contacted and asked about relevant publications and unpublished reports. Published literature on community based DOTS in Latin America is scanty: only two studies were identified. Both reported on experience in Chiapas, Mexico. A project implemented in Los Altos, Chiapas, comprised training peasants in strategies for case finding, and diagnosis by microscopy. Evaluation suggested that the peasants were able to case-find and diagnose with high efficiency. A project in Chicomuselo, Chiapas demonstrated the potential for peasants to case-find, diagnose, supervise treatment, and contact trace: 82% (24/29) of patients enrolled in this programme finished treatment and were cured.

5.3 Site visits

Visits were made to sites selected in consultation with local Pan American Health Organization (PAHO) officials. Only sites where DOTS is being implemented and those known to have a community-based TB care project were considered, following approval from the chief national officer responsible for TB control. Methods used to collect data in the sites visited included observation, interviews with key informants (community project leaders and health officers in charge of TB programmes) using a semi-structured interview guide, and review of NTP records.

5.3.1 Bolivia

Montero

TB control in Montero is based on the DOTS strategy and is fully integrated into the 11 health care areas of the province. Montero is a demonstration and training site for DOTS, and cure rates are 80-90%. There are 2 community-based TB care projects in Montero, one led by the local public health care authorities and the other led by the Andean Rural Health Council (this NGO provides primary health care services). In both, community-based case finding, community-based DOT, and defaulter tracing all occur. There are monthly TB club meetings and regular support visits at home to encourage adherence, especially early in treatment. Activities are coordinated and supervised by a TB health worker.

Patients living far from the nearest health post have the option of community-based DOT. In the case of the NGO project the community member providing TB care also plays the role of guarantor of treatment adherence. Typically the patient is asked to leave a personal belonging with the guarantor to encourage adherence. This article is returned on successful completion of treatment. Community volunteers are not paid, but they do receive incentives such as free medical consultations and discounts on prescribed drugs and building materials. Local staff believe the community-based TB strategies have contributed to the high cure rates achieved but unfortunately there is little objective data available and managers of the NGO and local NTP estimate that less than 6% of patients are supervised in the community.

Oruro

TB control in Oruro is also based on DOTS and is fully integrated into 6 of 7 health areas. Apparently, during the late 1980s community volunteers provided 30% of TB care, but there are no written records of this. Cure rates are above 80%. The community-based TB care project is lead by the Association of Health Promoters of the Rural Area of Oruro (APROSAR). The association is linked to Project Concern, a United States-based NGO that promotes the role of community volunteers in primary health care. Volunteers are selected by the community, trained in primary health care, and do not receive any payment. Community-based TB activities include case-finding, defaulter tracing, and home-based DOT. Health professionals employed by APROSAR closely supervise and support the volunteers. Project staff estimate that community volunteers have supervised less than 5% of all patients, but they are keen to increase this.

5.3.2 Colombia

Barranquilla

TB control is based on DOTS and, while centralised in hospital until 1995 care is now integrated into public and private health units. The cure rate for the 2000 cohort was

77%. There are 2 community based-TB care projects in Barranquilla, both led by associations of female volunteers, the Colombian League Against TB and Lung Diseases (LAC), and the Maria Rafols Association. LAC is a local chapter of a national NGO that aims to provide social support to TB patients and was created 50 years ago. Members are from well-to-do families and volunteers do not have a direct relationship with the patient, but with the health care workers in charge of case-finding and case-holding.

The María Rafols Association was created 10 years ago by middle class residents and Roman Catholic nuns, and is resourced by donations from members and local companies. Community-based TB care given by the LAC includes drugs, food packs, and money to pay for transport to the health post every day for DOT. LAC also employs a social worker to assist this effort. The Maria Rafols Association provides drugs, food and transport to patients in need, and arranges visits to patients to encourage adherence. Care given by the Maria Rafols Association is delivered directly by the Association's volunteers. Neither of these organizations supervises treatment, but the Maria Rafols Association does help to trace defaulters at the request of the NTP.

Popayan

TB control in Popayan is based on DOTS and is fully integrated into the 19 public health care units, with a cure rate of 78% in 2000. Community-based care includes active case finding, defaulter tracing, community-based DOT, lobbying of the local government, and the creation of vegetable gardens for patients. Activities are coordinated and directly supervised by a group of interested academics from the region's medical school that reports to the chief officer of the local NTP. Three different groups of community members are involved in direct delivery of TB care: 1) a group of 40 volunteers belonging to the Support Team for Popayan, 2) a community group from formal associations of neighbours, and 3) members of the judicial authority in the rural areas. There are no objective data on outcomes attributable to community care, but according to the leader of the groups, community volunteers supervise fewer than 5% of patients (most are rural patients living far from health posts).

Toribio

TB control is based on DOTS, is fully integrated into the 2 health units of the municipality, and the cure rate in 2000 was 78%. Community based TB care in Toribio was initiated in 1997 by the director of the local hospital in response to poor adherence and low cure rates. Community care activities include case finding, contact tracing, community-based DOT, participation in monthly patient meetings, and lobbying. Community members who provide TB care are selected by the community on the basis of leadership potential rather than willingness to volunteer. The hospital has no records which can be used to measure the impact of community contribution to TB care.

5.4 SUMMARY AND KEY MESSAGES

Three sites in Colombia and two in Bolivia, where the DOTS strategy for TB control is already being implemented, were visited. Features of the projects in these sites are a strong foundation of community involvement in primary health care, the existence of established NGOs, and charismatic leaders in the area. Community participation in these TB programmes includes case finding, community-based DOT, contact tracing, social support, and lobbying the local government. There are variable levels of integration with the NTP but in all sites the levels of community-based DOT are low, and lack of good records meant that the impact of community contribution on treatment outcomes could not be measured. The high level of community participation in civil society in general in Latin America, and in primary health care in particular, together with the experiences described here, suggests the potential for substantially enhanced community contribution to TB care, including community-based DOT by volunteers. What seems to be needed is improved recording and reporting systems.

KEY MESSAGES

- There is a strong foundation of community involvement in primary health care often through established NGOs in parts of Latin America
- Community participation in TB programmes includes case-finding, community-based DOT, contact tracing, social support, and lobbying local governments
- There are variable levels of integration with the NTP and levels of community-based DOT are low
- Although there seems to be limited evidence of impact of community contribution on treatment outcomes, the high level of community participation in civil society in general and in primary health care in particular suggest the potential for substantially enhanced community contribution to TB care

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POLICY RECOMMENDATIONS

The intention in promoting and supporting operational research undertaken by NTPs is to ensure national policy development based on the results of the individual projects in each country, and international policy development based on the collective lessons learned from all the projects. The local PIs from the "Community TB care in Africa" project presented their results at a "lessons learned" workshop held in Harare, Zimbabwe, in September 2000, and formulated policy recommendations based on their collective experience. This chapter sets out the policy recommendations which reflect experience gained from several sources: the "Community TB care in Africa" project; the overall review of community contribution to TB care described in Chapter 2; and the reviews of community contribution to tuberculosis programme service delivery in Asia and Latin America.

The policy recommendations address the following issues: the settings in which community contribution to TB care is relevant; the necessary steps in planning to increase community contribution to TB care; the integration of community TB care with local NTP activities; identifying suitable community groups or organizations; financing; selection, training and motivation of community TB treatment supporters; auditing and reporting of results; anti-TB drug regimens and logistics; and sustainability and expansion of the community TB care approach.

1. NTPs, health services, HIV/AIDS care and support NGOs, and communities should take steps towards increasing the community contribution to TB care in their settings.

- This is especially so for settings where the TB case load is overwhelming currently available resources.
- Even in those settings not currently experiencing an overwhelming case load, increasing community contribution, including community based DOT, may expand access to treatment for underserved patient groups, and may further improve treatment outcomes.

NTPs should extend TB care to the community in settings where health services are providing the basic elements of the DOTS strategy (the internationally recommended TB control strategy). Extension to the community improves the scope for increasing access to services that are currently of acceptable quality, but are under some strain (e.g. services are costly or TB wards are congested). Extension to the community also offers the potential to increase access to TB services under difficult circumstances (e.g. community poverty, long distances to health facilities, civil disruption and insecurity).

Steps to be taken when planning to increase the community contribution to TB care include:

- Obtain political commitment from local leaders (endorsement of support for approach) and Ministry of Health (responsibility for financing to provide start-up and recurrent costs, either directly or by brokering funding from partners).

- Conduct a situation analysis that includes all TB services and community contributions to TB care.
- Identify all relevant partners that might play a role in enabling community contribution to TB care.
- Specify the roles and functions of each partner.
- Establish the relationship between the partner and functions in the context of the existing health delivery system, in order to build upon and develop current strengths before seeking to develop new systems.
- Develop a training plan to cater for all the relevant partners and functions.
- Design and produce training tools (e.g. technical and operational manuals/guidelines, training manuals) tailored to the roles and tasks of the partners.
- Prepare for training (identify funds, identify relevant facilitators, conduct "training the trainer" sessions, schedule training).
- Conduct the training.
- Monitor and evaluate to identify new needs for training and retraining.

2. Community contribution to TB care should be closely linked to, or integrated with, local NTP activity.

- Community contribution to TB care should be seen as complementing and extending NTP capacity, not replacing NTP activity.
- Effective community contributions to TB care, especially community-based DOT, require a strong reporting system, access to laboratory facilities and a secure drug supply, through the NTP.
- Roles of community volunteers need clear and careful definition.

The community and the government should identify TB as a priority public health problem and agree to take shared responsibility. The NTP should be strong, with all the necessary components in place, particularly an effective recording and reporting system. Tasks of the community TB treatment supporter may vary but could include the following: support to TB patients to ensure adherence to treatment (including DOT); promotion of information and education about TB; referral of TB suspects for sputum examination; referral of TB patients on treatment for sputum checks; recording necessary information in DOT cards; referral of patients who have adverse drug reactions; feedback of information about treatment outcomes to the TB team; and involvement in early planning about community contribution to TB care. They may also provide counselling and support, and may help de-stigmatise the disease.

3. Existing community groups and organizations should be approached to determine how they might be able to make a contribution to community TB care, rather than setting up new systems, groups and organizations. For example, HIV/AIDS community organizations and groups represent an opportunity for collaboration with NTPs.

4. While community-based DOT is lower cost and more cost-effective than health facility-based care, new resources are needed for training and supervising community TB treatment supporters.

Ministries of Health need to ensure adequate financing for the community contribution to TB care on account of the new costs involved in harnessing this resource while recognising that this is a cost-effective approach.

KEY FINANCING ISSUES INCLUDE:

- Community contribution to TB care is associated with cost savings but also with new costs which require new investment.
- Community-based care should not replace government commitment or funding, but should be regarded as complementary and supplementary.
- Budgets should not be cut because of perceived cost savings – on the contrary, there is a need to manage more patients and to finance new costs.
- There are urban and rural differences in programmes, which may need different approaches to financing and budget levels.

New costs for community contribution to TB care include one-time start-up costs e.g. situational analysis, community mobilisation, and supervision. On-going recurrent costs include training, incentives, supervision and management at district, regional and central levels. Options for sourcing funds include government, NGOs, and donors. However, government has the primary responsibility for financing and it needs to identify the new costs, put them in a national budget and seek partners for help with financing. As a general principle, patients should not be asked to fund their own care.

5. The selection of community volunteers and the way in which they contribute to TB care should involve collaboration among the NTP, TB patients, community representatives and community group leaders.

Identification of suitable community TB treatment supporters requires consultation with the community and consideration of the benefits for sustainability of using a well-established, rather than a recently established, community group. It is necessary to ensure the selection of volunteers who can be trained to develop good practices, who can maintain confidentiality and who will fit into the relevant team structure specific to the local situation.

6. Training requirements may vary depending on the setting, ranging from short, repeated "on the job instruction" by NTP staff to more formal short courses of instruction supported by regular updates.

Training of community TB treatment supporters requires clear definition of roles and core tasks to ensure an effective working relationship with health workers. Training of different categories of health workers at the various levels of the health system as well as training of community members as TB treatment supporters have been important components in each of the pilot projects. Requirements include definition of the tasks

and roles of the community TB treatment supporters, identification of relevant groups and categories to perform the identified tasks, and steps to be taken in management. Booklets to support the community TB treatment supporter have been developed together with more comprehensive training materials.

Systematic training of CHWs usually takes place prior to delivery of the relevant community-based health care activity, e.g. provision of oral rehydration solution for childhood diarrhoea. However, in the case of TB, an alternative to training community members in advance is to train someone at the time of identification of the TB patient. This may help to build motivation since the community immediately perceives the problem and thus feels more ownership of the programme.

7. Community volunteers need regular support, motivation, instruction and supervision by NTP staff to ensure quality outcomes are maintained.

Health service support to community TB treatment supporters, including supervision, requires a system of regular contact between the community TB treatment supporters and general health service and NTP staff. Regular review meetings and a link person between the peripheral health unit and the community TB treatment supporters help to foster effective communication.

8. NTPs should consider what incentives for community volunteers, if any, are needed or appropriate.

Preventing "drop-out" of community TB treatment supporters requires ensuring that they continue to receive whatever is the perceived benefit in a specific setting. Some community TB supporters may require direct incentives, others act in a purely voluntary capacity, while others may receive incentives "in kind". Local communities and programmes will decide cooperatively what is most appropriate and effective.

9. Regular audit and reporting of results is important to monitor and evaluate the community contribution to TB care in each programme.

NTPs should ensure an effective recording and reporting system is extended into the community, with registers active beyond the peripheral health units. Records need to indicate the treatment supporter responsible for directly observing treatment for each TB patient and for recording TB drug administration on the patient treatment card. The patient needs to keep an identity card with information including type of TB, type of treatment, type of DOT supervision and sputum results.

NTPs should actively monitor community contribution to TB care using the standard NTP performance indicators (case finding and treatment outcomes), information on the numbers of patients choosing different DOT options, and, as they are developed, quality of care indicators.

10. NTPs should ensure an effective, secure and safe system of supply of anti-TB drugs to TB patients and their treatment supporters. The regimens used should be consistent with national guidelines. Drugs should be provided and packaged in ways to promote adherence e.g. as fixed-dose combinations and in calendar blister packs.

Drug regimens: NTPs should choose drug regimens which are consistent with national policy and which facilitate community-based DOT. For example, all the "Community TB care in Africa" projects used oral regimens, with ethambutol instead of streptomycin in the initial phase. Intermittent regimens can also increase TB patient convenience and acceptability, without reducing effectiveness.

Drug formulation and packaging: Drugs should preferably be provided in fixed-dose combinations and in calendar blister packs. The use of rifampicin in the continuation phase as well as in the initial phase depends on the availability of financial resources and the ability to ensure DOT throughout the full length of treatment.

Drug stock-keeping: There should be an established system of recording drug stocks at all levels. When drugs are provided to health units or sub-health units a designated person should record the amounts received. Standardised forms may be needed for this purpose. Similarly DOT forms will be needed for community-based workers to record drugs given to patients.

Drug supplies: The central level should procure anti-TB drugs. Proper and secure storage needs to be assured for all anti-TB drugs. Security of drugs is important. All attempts must be made to ensure that drugs are not stolen from health units and do not appear in the "black market". Periodic drug resistance surveillance will be important to monitor drug security procedures.

Drug distribution: There must be a regular drug supply. This should be quarterly from central level and regional level to the districts. It should be monthly from districts to health units, and possibly twice weekly from health units to community health workers. However, there needs to be flexibility in this approach, and the system adapted to the local situation. The important principle is that the patient has an uninterrupted supply of drugs and that drugs do not leak out of the system.

11. NTPs need to consider the key issues of sustainability and expansion of the community contribution to TB care, and collaboration with HIV/AIDS programmes (leading to integration where demonstrably beneficial).

It is generally not sustainable to load community members with successive additional responsibilities. It is necessary to provide additional support commensurate with additional responsibilities. Obtaining the commitment of Ministries of Health, NTPs, donors and NGOs to ensure the sustainability of the community approach requires advocacy and policy development based on results. NTPs should develop costed plans for expansion of the community approach. NTPs should develop clear criteria for choosing the districts targeted for expansion (e.g. NTP performance, problems of

access). Ministries of Health should consider opportunities for collaboration between NTPs and HIV/AIDS programmes (leading to integration where demonstrably beneficial), e.g. community health worker provision of integrated HIV/AIDS and TB care (provided that the stigma commonly attached to HIV/AIDS does not deter TB patients from obtaining care from HIV/AIDS groups).

Further reading

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COMMUNITY CONTRIBUTION TO TB CARE – THE FUTURE

Expanding implementation of community contribution to TB care in a wide variety of settings is crucial as part of the global expansion of the DOTS strategy. Learning lessons from the experience of expanding implementation requires rigorous evaluation. It is also important to promote further relevant operational research. The main focus of the community contribution to TB care has so far been on community support for TB patients to promote adherence to treatment, including through directly observed treatment. This chapter explores the current priority operational research questions and potential for expanded scope of community contribution to TB care in future.

7.1 Expansion beyond project sites

Several host countries have started a process of expanded implementation beyond the pilot districts, as described in Chapter 3. The "Community TB Care in Africa" project has yielded clear policy recommendations for mainstreaming community contribution to TB care as part of routine NTP operations. The WHO document "Treatment of TB: guidelines for national programmes" incorporates guidance on harnessing the community contribution to supporting TB patients during their treatment and ensuring treatment success. WHO coordinates a global network of technical assistance to support national level implementation of the DOTS strategy. Mainstreaming community contribution to TB care as part of routine NTP operations requires incorporation of community TB care policy recommendations in national level TB policy recommendations, and implementation with the assistance of the technical support agencies. National plans for improving coverage by the DOTS strategy should include budgeted plans for community TB care activities.

7.2 Operational research

Community contribution to TB care raises several specific operational research questions, including the following:

- How and why does the community contribution to TB care work better in some settings than others?
- How can we best harness the potential of HIV/AIDS community organizations to provide effective TB care in the community?
- How can community-based TB programmes effectively integrate with local HIV/AIDS prevention and care efforts?
- How can the lessons learned about combating AIDS-related stigma be applied to TB?
- Which TB treatment regimens and anti-TB drug formulations are most practical and effective for use when community members support patients to ensure treatment success?

7.3 The expanded scope of community contribution to TB care

Although the DOTS strategy is currently the most effective strategy available to control TB, there are technical and political challenges in expanding DOTS implementation. One of the most compelling technical challenges is ensuring that patients adhere to treatment. One of the most compelling political challenges is sustaining the political will to mobilise the resources needed in the medium and long term for the DOTS strategy to effectively control TB.

The operational research findings presented here strongly suggest that the community can contribute very effectively to addressing the first challenge, by supporting TB patients to complete their treatment, through DOT. This community contribution is not limited to those settings where the health system capacity to deliver services is threatened or overrun by the HIV epidemic, as is the case in much of sub-Saharan Africa. Indeed, community participation in the creation and operation of effective social support networks (providing material, emotional and information support) can help NTPs develop the appropriate conditions needed to achieve the TB control goals. Enablers and incentives are the most common form of social support reported in the literature and they are usually provided by the NTPs themselves, either with or without the support of external donors. However, this need not be so everywhere. NTPs can stimulate and help communities, either as loose partnerships of individuals or as more organized groups, to coordinate the provision of social support that helps patients maintain adherence. Providing transport, food supplements, and the promotion of community development opportunities such as vegetable gardens are examples of how communities can further contribute to effective case management beyond the actual delivery of DOT. To be successful in this, NTPs need to work with patients and communities to identify and overcome the barriers to adherence that patients face.

Community participation is a dynamic and intricate concept comprising a range of activities including the "rowing" and the "steering" of the social development process. Local social and political complexities, as well as levels of community maturity and capacity to respond, determine the type of participation that occurs. "Steering", that is, the community being part of those leading the development process, is a more complex and difficult task dealing with how power is distributed and used in the territory by the political actors. "Steering" is far more difficult to deploy, as it requires from the community and the facilitators some specific skills, in a supportive environment, for its full deployment. Thus, it is not uncommon that "rowing" (i.e. provision of specific free services by the community) is the most common and "successful" example of community participation. "Rowing" has been traditionally the most easy and effective way for getting the community involved in health care issues, usually under the leadership of local authorities. While this approach may be very useful in many settings, especially those where resources are limited, it should not be seen as the only approach.

The future of TB control depends to a great extent on sustained political will. Lobbying, advocacy and social mobilization, led by community organizations, can contribute to having TB control high in the local and national public health agenda. Thus, the scope for community participation in TB control goes beyond DOT. Moreover, although in many

settings where the TB burden is severe there is not very much opportunity for community "steering", the health care reform ongoing in many of them does create opportunities for this form of community participation. Decentralisation, for example, entails devolution of some power and resources to local level, and the creation of mechanisms that enable the participation of the community in the allocation of resources and in local decision-making.

Community "steering'" can be a tool to counteract the lack of political willingness to address TB control; however, a strong negotiating capacity is required. Yet it is precisely in those settings where the community participation is most needed, that capacity in community organizations may be particularly limited. This is where more organized and structured community groups, such as NGOs, and the NTP itself, can provide important support.

Representation of community groups on the board of the Global Fund for AIDS, TB and Malaria provides an encouraging example of progress in ensuring that the voice of communities is heard not only locally but also nationally, regionally and globally.

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ECONOMIC METHODOLOGY

Costs were assessed from a societal perspective in 1997 or 1998 US$, using standard methods. For provider costs, the average costs of each component of treatment (e.g. a day in hospital, drugs, a DOT visit, supervision by CHWs, community mobilisation, training) were calculated individually. Wherever possible, this was done by combining data on the quantity of resources used with their unit prices. The one exception was non-personnel recurrent expenditure in hospitals and clinics, for which only aggregated expenditure data were available. Joint hospital costs were allocated between outpatient and inpatient care according to the fraction of total clinical and nursing staff costs for which they accounted. Costs allocated to inpatient care were allocated to general medical or TB wards, according to the fraction of total hospital patient days for which the general medical or TB wards accounted. It was assumed that a day in hospital for a TB patient was the same as for any other general medical patient, and that a visit to a clinic by a TB patient was the same as the cost for any other type of visit. Capital costs were annualised using a discount rate of 3% (the internationally recommended rate) and locally appropriate assumptions about the expected years of useful life of buildings, vehicles and equipment.

The main sources of data were budget and expenditure files for hospitals and the district as a whole, hospital payrolls, published drug prices, standard salary scales for established positions, vehicle logbooks, district reports, hospital midnight bed-state statistics, laboratory workload records, the Planning Unit at the Ministry of Health, and interviews with NTP staff.

Patient costs were estimated using structured interviews among a random sample of patients. Patients were asked about travel and time costs associated with days in hospital, visits to volunteers for DOT, and visits to the nearest health facility from which they could collect drugs during the continuation phase of treatment. Time costs were converted to a monetary value based on the average reported hourly income among interviewed patients.

Volunteer costs were assessed using a structured questionnaire which was administered to all volunteers involved in TB care at the time fieldwork was being undertaken. Volunteers were asked about the time and travel costs involved in directly observing treatment, motivating patients, collecting drugs and receiving training, as well as any additional expenditure that was associated with their role in observing treatment. Time costs were valued according to reported average incomes.

For each strategy, average costs were multiplied by the number of times each cost was incurred to calculate the cost per patient treated. Cost-effectiveness was calculated as the cost per patient successfully treated for new smear-positive and retreatment patients, as the cost per patient completing treatment for new smear-negative and extrapulmonary patients, and as the cost per patient compliant with treatment for chronic patients. Effectiveness was based on routinely collected treatment outcome

data for the cohort of patients treated by the conventional approach and the community-based care approach. Sensitivity analyses were undertaken to explore the implications of plausible alternative assumptions regarding the costs that most influenced results.

Drummond, M. F., O'Brien B, Stoddart GL. 1997. Methods for the Economic Evaluation of Health Care Programmes. Oxford University Press. Second Edition.
Gold MR, Siegel JE, Russell LB and Weinstein MC (eds). 1996. Cost-effectiveness in health and medicine. Oxford University Press. New York.
World Health Organization. Guidelines for cost and cost-effectiveness analysis of tuberculosis control (3 documents). WHO/CDS/TB/2002.305a-305c

DETAILED DATA FROM "COMMUNITY TB CARE IN AFRICA" PROJECTS

Francistown, Botswana

TABLE 1 OUTCOMES OF TB PATIENTS ON HOME-BASED CARE COMPARED WITH OTHER TB PATIENTS IN FRANCISTOWN, 1997

Outcome	Home-based Care TB Patients (n = 50)	Other TB patients (n = 583)
Died on treatment	19 (38%)	79 (14%)
Completed treatment	19 (38%)	306 (52%)
Defaulted	2 (4%)	80 (14%)
Transferred out	1 (2%)	117 (20%)
No record	9 (18%)	0
Compliance (%)	96%	92%

TABLE 2 AVERAGE HEALTH SYSTEM COSTS ASSOCIATED WITH TB TREATMENT, 1998 US$, FRANCISTOWN, BOTSWANA

Cost Item	Cost
Day in hospital on TB ward	24
Visit to health clinic	8
Drug regimen	18
Supervision/support provided by home-based care team (per patient)	176

TABLE 3 AVERAGE CAREGIVER COSTS ASSOCIATED WITH TB TREATMENT, CHRONICALLY-ILL TB PATIENTS, FRANCISTOWN, BOTSWANA, 1998 US$

Cost item (n=50)	Travel cost	Time cost (quantity of time)	Total cost
Day in hospital	2	1.0 (2.5 hours)	3.0
Clinic visit to collect drugs	0.1	0.1 (20 minutes)	0.2
Care provided at home, per day	0	0.5 (1.2 hours)	0.5
Miscellaneous items	N/A[a]	N/A[a]	441

[a] N/A = Not applicable

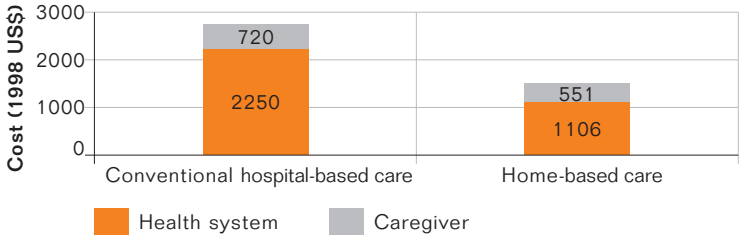
TABLE 4 AVERAGE COST PER PATIENT TREATED, HOME-BASED CARE STRATEGY, 1998 US$ (% COLUMN TOTAL), IN FRANCISTOWN

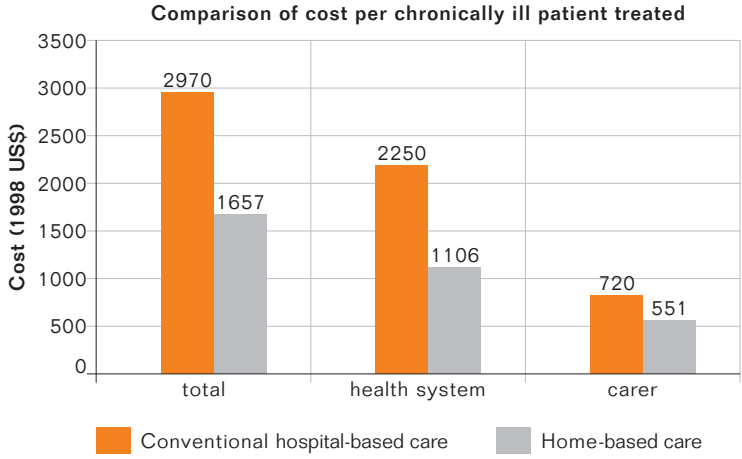
Cost item	Health system	Caregiver	Total
21 days in hospital	504 (46)	63 (11)	567 (34)
51 visits to collect drugs	408 (37)	10 (2)	418 (25)
Home-based care team	176 (16)	0	176 (11)
Drugs	18 (2)	0	18 (1)
Care provided at home	0	37 (7)	37 (2)
Miscellaneous items	0	441 (80)	441 (27)
Total	**1,106**	**551**	**1,657**

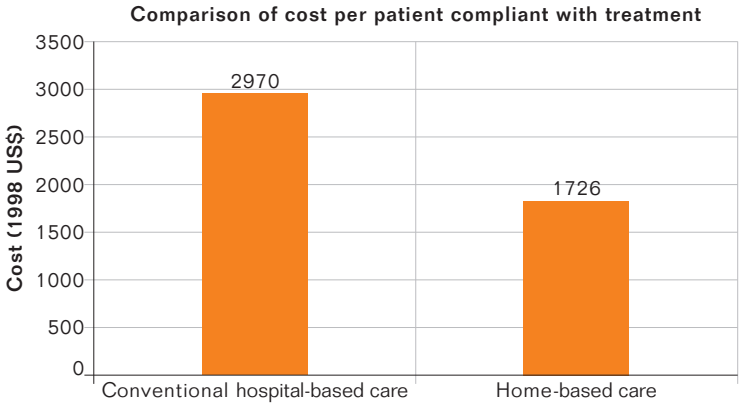
TABLE 5 AVERAGE COST PER PATIENT TREATED, HOSPITAL-BASED CARE STRATEGY, 1998 US$ (% COLUMN TOTAL), IN FRANCISTOWN

Cost item	Health system	Caregiver	Total
93 days in hospital	2,232 (99)	186 (26)	2,418 (81)
Drugs	18 (1)	93 (13)	111 (4)
Miscellaneous items	0	441 (61)	441 (15)
Total	**2,250**	**720**	**2,970**

FIGURE 1 THE TOTAL COST OF TREATMENT OF THE HOSPITALISED CHRONICALLY ILL TB PATIENT COMPARED WITH TREATMENT OF A TB PATIENT ON HOME-BASED CARE IN FRANCISTOWN







Machakos, Kenya

TABLE 1 TREATMENT OUTCOMES FOR NEW SPUTUM SMEAR-POSITIVE PULMONARY TB PATIENTS.

Year	Quarter	Cured n (%)	Treatment Completed	Failure n (%)	Died n (%)	Treatment interrupted (defaulted) n (%)	Transfer n (%)	Total n (%)
Control period (options for DOT do not include decentralised ambulatory supervision)								
1996	1	86 (61)	37 (26)	2 (1)	9 (6)	2 (1)	6 (4)	142 (100)
	2	87 (60)	21 (14)	12 (8)	16 (11)	5 (3)	5 (3)	146 (100)
	3	150 (78)	15 (8)	6 (3)	9 (5)	8 (4)	5 (3)	193 (100)
	4	98 (82)	15 (13)	1 (1)	3 (3)	0	2 (2)	119 (100)
	Total	**421 (70)**	**88 (15)**	**21 (4)**	**37 (6)**	**15 (3)**	**18 (3)**	**600 (100)**
Run-in period (preparations for decentralised ambulatory supervision options for DOT)								
1997	4	91 (73)	20 (16)	1 (1)	9 (7)	1 (1)	3 (2)	125 (100)
Intervention period (options for DOT include decentralised ambulatory supervision)								
1998	1	159 (85)	13 (7)	1 (1)	5 (3)	2 (1)	8 (4)	188 (100)
	2	186 (86)	4 (2)	0 (0)	6 (3)	13 (6)	8 (4)	217 (100)
	3	143 (68)	29 (14)	4 (2)	15 (7)	18 (9)	1 (1)	210 (100)
	4	207 (84)	12 (5)	2 (1)	8 (3)	19 (8)	0 (0)	248 (100)
	Total	**695 (81)**	**58 (7)**	**7 (1)**	**34 (4)**	**52 (6)**	**17 (2)**	**863 (100)**
1999	1	156 (83)	9 (5)	1 (1)	6 (3)	13 (7)	3 (2)	188 (100)
	2	148 (76)	10 (5)	9 (5)	8 (4)	16 (8)	3 (2)	194 (100)
	3	209 (85)	7 (3)	0 (0)	8 (3)	18 (7)	4 (2)	246 (100)
	4	182 (94)	2 (1)	0 (0)	9 (5)	0 (0)	0 (0)	193 (100)
	Total	**695 (85)**	**28 (3)**	**10 (1)**	**31 (4)**	**47 (6)**	**10 (1)**	**821 (100)**

TABLE 2 COMPARISON OF TREATMENT OUTCOMES (NEW SMEAR POSITIVE PULMONARY TB): INTERVENTION (1998 AND 1999) VERSUS CONTROL (1996) PERIOD

Outcome of treatment	Control period (1996)	Intervention period (1998 and 1999)
Treatment success[#]	509 (85%)	1476 (88%)
Failed	21 (4%)	17 (1%)
Died	37 (6%)	65 (4%)
Defaulted	15 (3%)	99 (6%)
Transfer	18 (3%)	27 (2%)
Total	**600 (100%)**	**1684 (100%)**

[#]Treatment success = cured + treatment completed

TABLE 3 TREATMENT OUTCOMES FOR NEW SPUTUM SMEAR-NEGATIVE PULMONARY AND EXTRAPULMONARY TB PATIENTS, MACHAKOS

Year	Quarter	Cured n (%)	Treatment Completed	Failure n (%)	Died n (%)	Treatment interrupted (defaulted) n (%)	Transfer n (%)	Total n (%)
Control period (options for DOT do not include decentralised ambulatory supervision)								
1996	1		61 (53)		16 (14)	33 (28)	6 (5)	116 (100)
	2		47 (40)		6 (5)	67 (56)	0 (0)	120 (100)
	3		67 (55)		9 (7)	43 (35)	4 (3)	123 (100)
	4		67 (48)		21 (15)	42 (30)	10 (7)	140 (100)
	Total		**242 (49)**		**52 (10)**	**185 (37)**	**20 (4)**	**499 (100)**
Run-in period (preparations for decentralised ambulatory supervision options for DOT)								
1997	4		63 (68)		16 (17)	5 (5)	9 (10)	93 (100)
Intervention period (options for DOT include decentralised ambulatory supervision)								
1998	1		65 (74)		8 (9)	2 (2)	13 (15)	88 (100)
	2		125 (74)		11 (7)	20 (12)	14 (8)	170 (100)
	3		110 (74)		7 (5)	14 (9)	18 (12)	149 (100)
	4		178 (80)		18 (8)	23 (10)	3 (1)	222 (100)
	Total		**478 (76)**		**44 (7)**	**59 (9)**	**48 (8)**	**629 (100)**
1999	1		149 (85)		22 (13)	4 (2)	1 (1)	176 (100)
	2		166 (81)		11 (5)	24 (12)	3 (2)	204 (100)
	3		110 (73)		9 (6)	29 (19)	3 (2)	151 (100)
	4		115 (88)		11(8)	4 (3)	1 (1)	131 (100)
	Total		**540 (82)**		**53 (8)**	**61 (9)**	**8 (1)**	**662 (100)**

TABLE 4 COMPARISON OF TREATMENT OUTCOMES (NEW SMEAR-NEGATIVE PULMONARY AND EXTRAPULMONARY TB): INTERVENTION (1998 AND 1999) VERSUS CONTROL PERIOD (1996) , MACHAKOS

Outcome of treatment	Control period (1996)	Intervention period (1998 and 1999)
Completed	242 (49)	1018 (79)
Died	52 (10)	97 (8)
Defaulted	185 (37)	120 (9)
Transfer	20 (4)	56 (4)
Total	**499 (100)**	**1291 (100)**

TABLE 5 OPTIONS FOR DOT DURING THE INTENSIVE PHASE, MACHAKOS

Option for DOT supervision Number (%)	Before 1998	1998	1999	Total 1998+1999	2000	Total 1998, 1999+2000
Hospital admission	all	15 (1)	138 (8)	153 (4)	173 (10)	326 (7)
Chest clinic in hospital	nil	791 (52)	827 (48)	1618 (50)	846 (49)	2464 (50)
Peripheral health units	nil	457 (30)	447 (26)	904 (28)	483 (28)	1387 (28)
Community volunteers	nil	259 (17)	310 (18)	569 (18)	224 (13)	793 (16)
Total	**n/r**	**1522 (100)**	**1722 (100)**	**3244 (100)**	**1726 (100)**	**4970 (100)**

FIGURE 1 CHOICE OF SUPERVISION SITES, MACHAKOS

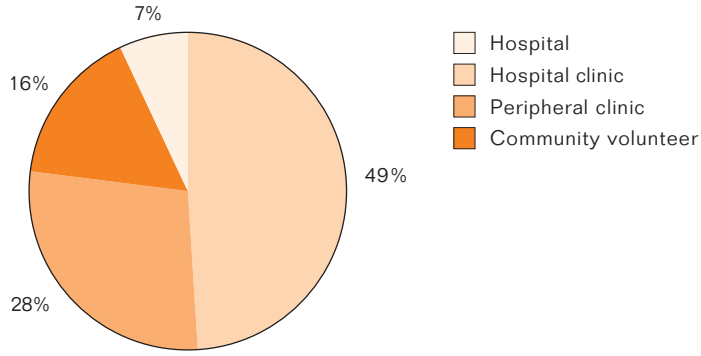


TABLE 6 AVERAGE COST OF INDIVIDUAL COMPONENTS OF TB DIAGNOSIS AND TREATMENT IN MACHAKOS, KENYA, 1998 US$ [95% CONFIDENCE INTERVAL]

Cost item	Health system		Patient		Family (n=30)
	Conventional approach	Decentralised and community-based approach	New smear positive (n=57)	New smear negative/EP* (n=30)	
Day in hospital on TB ward	4.0	N.A. (TB wards closed)	1.8 [1.0,2.6]	1.4 [0.8,2.1]	3.0 [1.8,4.2]
Day in hospital on general medical ward	N.A.	7.7	1.8 [1.0,2.6]	1.4 [0.8,2.1]	3.0 [1.8,4.2]
TB clinic visit	1.4	1.5	1.9 [1.4,2.3]	1.9 [1.1,2.7]	N.A.
Peripheral health unit (health centre, dispensary, Bamako Initiative centre)	2.4	2.3	N.A.	N.A.	N.A.
Outpatient DOT visit	N.A.	1.4**	1.1 [0.6,1.6]	1.2 [0.5,1.9]	0.8 [0.5,1.1]
Drug regimen, sm+ patients	43	25	N.A.	N.A.	N.A.
Drug regimen, sm- and EP* patients	25	17	N.A.	N.A.	N.A.
Sputum smear (monitoring)	0.9	0.9	N.A.	N.A.	N.A.
Training, introduction of decentralised/community-based care	N.A.	4.0	N.A.	N.A.	N.A.
District supervision (per patient)	1.1	1.5	N.A.	N.A.	N.A.
Provincial supervision (per patient)	0.1	0.6	N.A.	N.A.	N.A.

* EP = extra-pulmonary
** based on pattern of DOT supervision 1998-2000 (6.6% in hospital, 49.6% at the Machakos hospital TB clinic, 27.9% at peripheral health units, and 16.0% by community volunteers)

Table 7 Average cost per patient treated for new smear-positive pulmonary TB patients, alternative approaches, 1998 US$ (% column total*), Machakos

Conventional approach used until October 1997					New decentralised/community-based care approach				
Cost item	**Health system**	**Patient**	**Family**	**Total**	**Cost item**	**Health system**	**Patient**	**Family**	**Total**
60 days in hospital	240 (82)	108 (92)	180 (100)	528 (89)	4 days in hospital	31 (26)	7 (14)	12 (32)	50 (24)
Outpatient DOT visits	N.A.	N.A.	N.A.	N.A.	32 outpatient DOT visits	45 (37)	35 (69)	26 (68)	106 (48)
5 visits to collect drugs	7 (2)	9 (8)	N.A.	16 (3)	5 visits to collect drugs	7 (6)	9 (18)	N.A.	16 (8)
Drugs	43 (15)	N.A.	N.A.	43 (7)	Drugs	28 (23)	N.A.	N.A.	28 (13)
Sputum smears	3 (1)	N.A.	N.A.	3 (0.5)	Sputum smears	3 (2)	N.A.	N.A.	3 (1)
District supervision	1 (0.3)	N.A.	N.A.	1 (0.2)	District supervision	1.5 (1)	N.A.	N.A.	1.5 (1)
Provincial supervision	0.1 (0.03)	N.A.	N.A.	0.1 (0.02)	Provincial supervision	0.6 (0.5)	N.A.	N.A.	0.6 (0.3)
Training	N.A.	N.A.	N.A.	N.A.	Training	4 (3)	N.A.	N.A.	4 (2)
ALL	**294**	**117**	**180**	**591**	**ALL**	**120**	**51**	**38**	**209**

* numbers do not always sum to 100 due to rounding errors

TABLE 8 AVERAGE COST PER PATIENT TREATED FOR NEW SMEAR-NEGATIVE PULMONARY AND EXTRA-PULMONARY TB PATIENTS, ALTERNATIVE APPROACHES, 1998 US$ (% COLUMN TOTAL*), MACHAKOS

Conventional approach used until October 1997					New decentralised/community-based care approach				
Cost item	**Health system**	**Patient**	**Family**	**Total**	**Cost item**	**Health system**	**Patient**	**Family**	**Total**
30 days in hospital	120 (75)	42 (69)	90 (100)	252 (81)	4 days in hospital	31 (26)	6 (10)	12 (32)	49 (23)
Outpatient DOT visits	N.A.	N.A.	N.A.	N.A.	32 outpatient DOT visits	45 (38)	38 (62)	26 (68)	109 (47)
10 visits to collect drugs	14 (9)	19 (31)	N.A.	33 (11)	9 visits to collect drugs	13 (11)	17 (28)	N.A.	30 (13)
Drugs	25 (16)	N.A.	N.A.	25 (8)	Drugs	17 (15)	N.A.	N.A.	17 (8)
District supervision	1 (0.7)	N.A.	N.A.	1 (0.3)	District supervision	1.5 (1)	N.A.	N.A.	1 (0.5)
Provincial supervision	0.1 (0.06)	N.A.	N.A.	0.1 (0.03)	Provincial supervision	0.6 (0.5)	N.A.	N.A.	1 (0.5)
Training	N.A.	N.A.	N.A.	N.A.	Training	4 (3)	N.A.	N.A.	4 (2)
ALL	**160**	**61**	**90**	**311**	**ALL**	**112**	**61**	**38**	**211**

*numbers do not always sum to 100 due to rounding errors

FIGURE 2 COMPARISON OF COSTS PER PATIENT TREATED, NEW SMEAR-POSITIVE PULMONARY TB PATIENTS, MACHAKOS

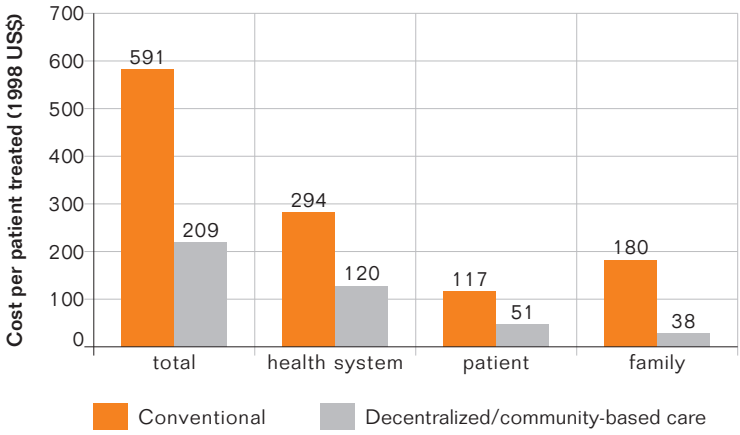


FIGURE 3 COMPARISON OF COST PER PATIENT TREATED, NEW SMEAR-NEGATIVE AND EXTRA-PULMONARY TB PATIENTS, MACHAKOS

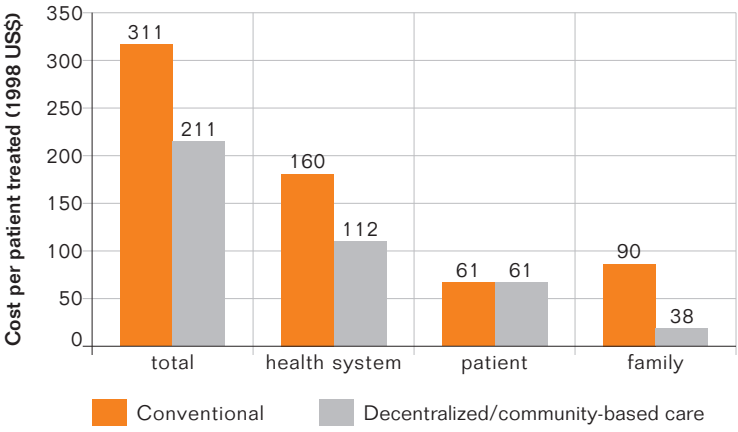
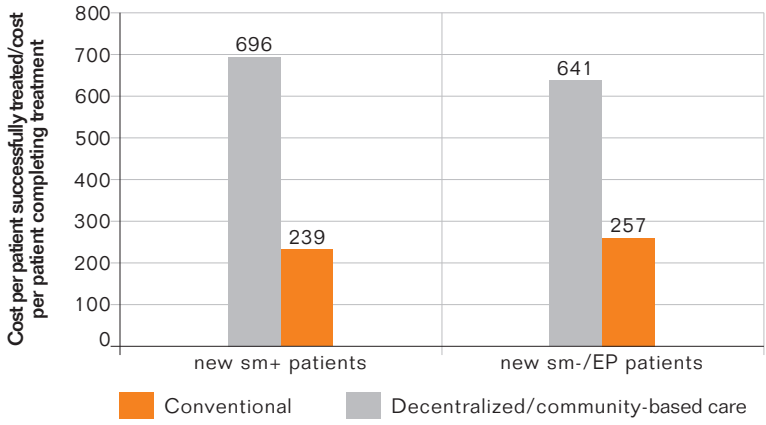


FIGURE 4 COST-EFFECTIVENESS OF CONVENTIONAL AND DECENTRALISED/ COMMUNITY-BASED TREATMENT STRATEGIES, MACHAKOS



EP= extra-pulmonary

Lilongwe, Malawi

TABLE 1 TREATMENT OUTCOME OF NEWLY REGISTERED TB PATIENTS IN LILONGWE IN 1998, BY TYPE OF TB.

	Smear positive PTB	Smear negative PTB	EPTB
	Number (%)		
Number	**1492 (40)**	**1329 (35)**	**940 (25)**
2-months outcome:			
Smear negative	1202 (81)	-	-
Smear positive	26 (2)	-	-
Smear not done	78 (5)	948 (71)	665 (71)
Dead	125 (8)	82 (6)	93 (10)
Defaulted	16 (1)	40 (3)	36 (4)
Transfer out	28 (2)	61 (5)	50 (5)
Stopped treatment[a]	0	1	5
Unknown[b]	17 (1)	197 (15)	91 (10)
8-months outcome:			
Cured	958 (64) -	-	
Treatment completed	55 (4)	608 (46)	502 (54)
Died	302 (20)	195 (15)	132 (14)
Defaulted	69 (5)	100 (7)	115 (12)
Transfer out	84 (6)	101 (8)	78 (8)
Failure	6	-	-
Stopped treatment[a]	0	1	7 (1)
Unknown[b]	18 (1)	324 (24)	106 (11)

[a] treatment stopped because diagnosis of TB considered incorrect
[b] unknown outcome because treatment cards lost and no record in register

TABLE 2 COMPARISON OF TREATMENT OUTCOME OF PATIENTS WITH NEW SMEAR POSITIVE PTB REGISTERED IN 1997 WITH THOSE REGISTERED IN 1998 IN LILONGWE DISTRICT.

	Jan – Sept 1997[a] (2SRHZ/6HE)	Jan – Dec 1998 ($2R_3H_3Z_3E_3$/6HE)
Registered Patients	653	1492
Number (%)		
Cured	368 (56)	958 (64)
Completed treatment	12 (2)	55 (4)
Died	113 (17)	302 (20)
Defaulted	121 (19)	69 (5)
Transferred out	37 (6)	84 (6)
Failed	2	6
Outcome unknown[b]		18 (1)

[a] patients registered in fourth quarter are excluded because new (study) treatment regimens were used for most of this period
[b] unknown outcome because treatment cards lost and no records in register

TABLE 3 COMPARISON OF TREATMENT OUTCOME OF NEW SMEAR NEGATIVE PTB PATIENTS REGISTERED IN THE FIRST 6 MONTHS OF 1997 AND 1998 UNDER CENTRALISED AND DECENTRALISED CARE RESPECTIVELY, LILONGWE

	1997 ($2R_3H_3Z_3$/2HE/4H)	1998 ($2R_3H_3Z_3$/6HE)
Registered Patients	554	581
Number (%)		
Completed treatment	185 (33)	293 (50)
Died	23 (4)	97 (17)
Defaulted (includes no information)	305 (55)	136 (23)
Transferred out	41 (8)	54 (10)
Stopped treatment[a]	0	1

[a] treatment stopped because diagnosis of TB considered incorrect

FIGURE 1 CHOICE OF SUPERVISION SITES, LILONGWE

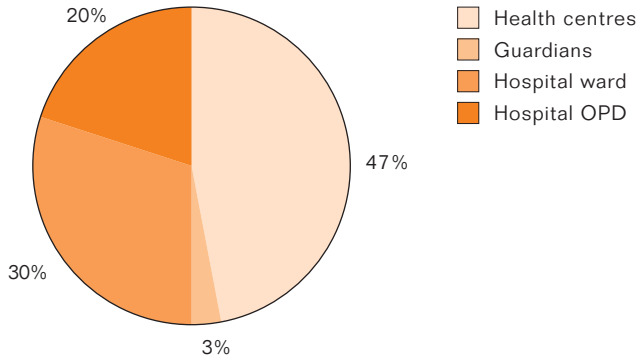


FIGURE 2 CHOICE OF SUPERVISION SITES, MALAWI (5 DISTRICTS)

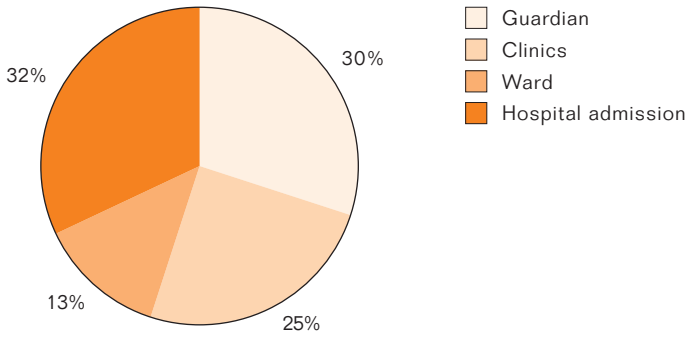


TABLE 4 AVERAGE COST OF INDIVIDUAL COMPONENTS OF TB DIAGNOSIS AND TREATMENT IN LILONGWE DISTRICT, MALAWI, 1998 US$

Cost item	Health system		Patient[1] (time taken in minutes)		Guardian (n=27)
	Conventional hospital-based care	Decentralised care	New smear positive n=74	New smear negative n=107	
Day in hospital[2]	3.2	4.0	3.8	N.A.	N.A.
Day in hospital[2]	3.0	3.9	N.A.	1.8	N.A.
Visit to health centre for collection of drugs	0.6	0.6	1.6 (95)	1.5 (116)	2.3
Outpatient DOT visit, new smear-positive patients[3]	N.A.	0.5	1.6 (95)	N.A.	N.A.
Outpatient DOT visit, new smear-negative patients[3]	N.A.	0.2	N.A.	0.7 (63)	N.A.
Drug regimen, sm+ patients	34.6	20.7	N.A.	N.A.	N.A.
Drug regimen, sm- patients	11.7	18.2	N.A.	N.A.	N.A.
Sputum smear (monitoring)	0.6	0.4	N.A.	N.A.	N.A.
Training, introduction of decentralised/community-based care	N.A.	3.0	N.A.	N.A.	N.A.
District supervision (per patient)	1.7	5.0	N.A.	N.A.	N.A.
Miscellaneous items[4]	N.A.	N.A.	N.A.	N.A.	2.8

1 *Time valued at 0.008 per minute for smear-positive patients, based on reported average monthly income (US$84) and assumption people work 22 days a month and 8 hours a day; and at 0.004 for smear-negative patients, based on similar assumptions and an average reported monthly income of US$41*

2 *weighted according to the number of patients treated and the average length of stay in the mission and government sectors*

3 *based on pattern of outpatient DOT supervision in 1998 (for smear-positive patients, 67% used a health centre, 4% used a guardian, and 29% used a hospital outpatient department (OPD); for smear-negative patients, 69% used a guardian, 19% used a health centre and 12% used a hospital OPD. Cost of a visit to a hospital OPD was US$0.3)*

4 *main item = purchase of special foods*

TABLE 5 AVERAGE COST PER PATIENT TREATED FOR NEW SMEAR-POSITIVE PULMONARY TB PATIENTS, ALTERNATIVE STRATEGIES, 1998 US$ (% COLUMN TOTAL*), LILONGWE

Conventional hospital-based care				Decentralised care			
Cost item	**Health system**	**Patient**	**Total**	**Cost item**	**Health system**	**Patient**	**Total**
58 days in hospital	186 (81)	220 (96)	406 (89)	16 days in hospital	64 (60)	61 (64)	125 (62)
Outpatient DOT visits	N.A.	N.A.	0	16 outpatient DOT visits	8 (8)	26 (27)	34 (17)
5 visits to collect drugs	3 (1)	8 (4)	11 (2)	5 visits to collect drugs	3 (3)	8 (8)	11 (5)
Drugs	35 (15)	0	35 (8)	Drugs	21 (20)	0 (0)	21 (10)
Sputum smears	2 (1)	0	2 (0.5)	Sputum smears	2 (2)	0 (0)	2 (1)
District supervision	2 (1)	0	2 (0.5)	District supervision	5 (5)	0 (0)	5 (2)
Training for introduction of new approach	N.A.	N.A.	0 (0)	Training for introduction of new approach	3 (3)	0 (0)	3 (1)
All	228	228	456	All	106	95	201

*percentage totals do not always sum to 100 due to rounding errors

TABLE 6 AVERAGE COST PER PATIENT TREATED, FOR NEW SMEAR-NEGATIVE PULMONARY TB PATIENTS, ALTERNATIVE STRATEGIES, 1998 US$ (% COLUMN TOTAL*), LILONGWE

Conventional unsupervised approach				Decentralised/community-based care				
Cost item	Health system	Patient	Total	Cost item	Health system	Patient	Guardian	Total
8 days in hospital	24 (57)	14 (56)	38 (57)	8 days in hospital	31 (49)	14 (42)	0 (0)	45 (45)
Outpatient DOT visits	N.A.	N.A.	0 (0)	16 outpatient DOT visits	3 (5)	11 (33)	0 (0)	14 (14)
7 visits to collect drugs	4 (10)	11 (44)	15 (22)	5 visits to collect drugs	3 (5)	8 (24)	0 (0)	11 (11)
Drugs	12 (29)	0 (0)	12 (18)	Drugs	18 (29)	0 (0)	0 (0)	18 (18)
District supervision	2 (5)	0 (0)	2 (3)	District supervision	5 (8)	0 (0)	0 (0)	5 (5)
Training for introduction of new approach	N.A.	N.A.	0 (0)	Training for introduction of new approach	3 (5)	0 (0)	0 (0)	3 (3)
Miscellaneous	N.A.	N.A.	0 (0)	Miscellaneous	0 (0)	0 (0)	5 (100)	5 (5)
All	42	25	67	All	63	33	5	101

*percentage totals do not always sum to 100 due to rounding errors

FIGURE 3 COMPARISON OF COST PER NEW SMEAR-POSITIVE PULMONARY TB PATIENT TREATED, ALTERNATIVE APPROACHES, LILONGWE

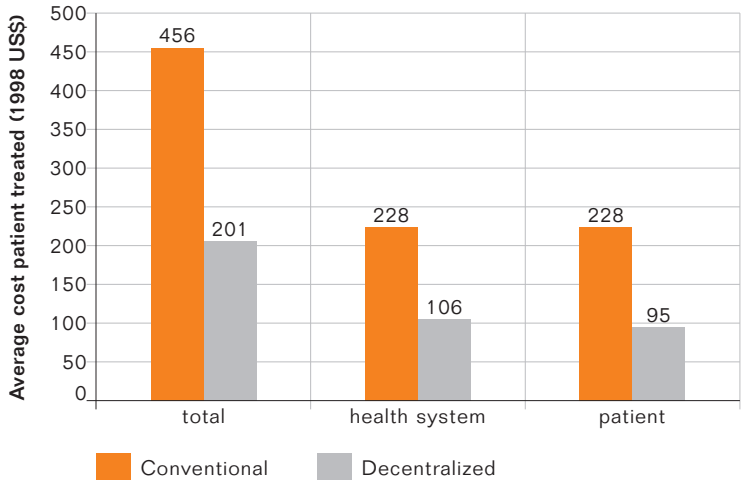


FIGURE 4 COMPARISON OF COST PER NEW SMEAR-NEGATIVE PULMONARY TB PATIENT TREATED, ALTERNATIVE APPROACHES, LILONGWE

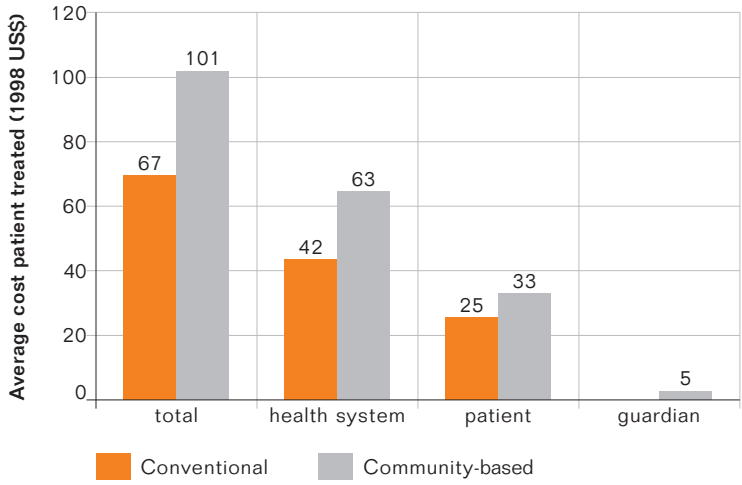
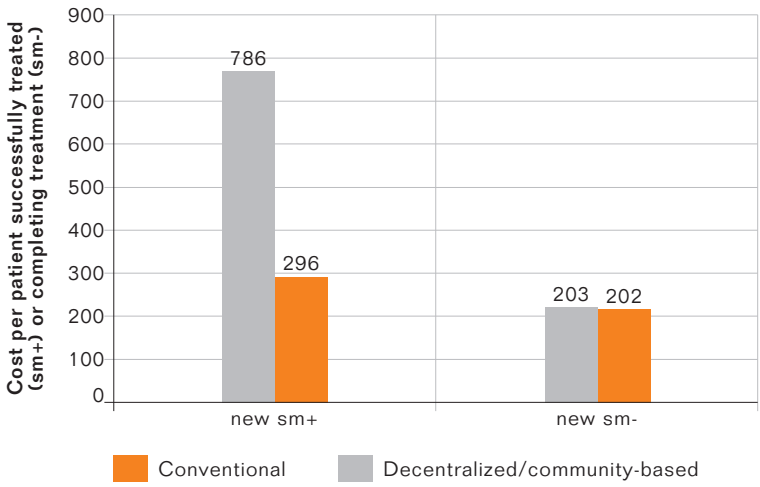


FIGURE 5 COST-EFFECTIVENESS OF TREATMENT, ALTERNATIVE APPROACHES, LILONGWE



Kiboga, Uganda

TABLE 1 TREATMENT OUTCOMES FOR NEW SMEAR POSITIVE PULMONARY TB CASES BEFORE AND AFTER THE INTRODUCTION OF COMMUNITY BASED DOTS (CB-DOTS)

	Pre-CB-DOTS (1995-7)	Post CB-DOTS (1998-9)
	N (%)	
Cured	149 (45)	183 (62)
Treatment completed	36 (11)	34 (12)
Failure	3 (1)	0
Died	50 (15)	40 (14)
Treatment interrupted	74 (23)	4 (1)
Transfer	17 (5)	33 (11)
Total	329	294
Treatment success[a]	185 (56)	217 (74)

[a]treatment success = cured plus treatment completed

TABLE 2 AVERAGE COST OF INDIVIDUAL COMPONENTS OF TB DIAGNOSIS AND TREATMENT FROM THE PERSPECTIVE OF HEALTH SERVICES IN KIBOGA DISTRICT, UGANDA, 1998 US$

Cost Item	Average cost
Costs relevant pre- and post-community DOT	
Day in hospital (range of costs found in Masindi District)	6.0 (6.0-9.6)
Day in hospital if 100% bed occupancy assumed and only non-personnel expenditure items that clearly increase in line with patient numbers included	1.7*
Outpatient visit to hospital or health centre	0.7
Drug regimen, smear-positive patients	32.0
Sputum smear	0.5
Costs relevant pre-community DOT	
District supervision (per patient)	16.2
Zonal supervision (per patient)	7.0
Costs relevant to community DOT	
Initial contact, district health team (per patient)	1.6
Situational analysis (per patient)	3.3
District review manual (per patient)	0.02
Training health workers (per patient)	7.1
Training, community volunteers (per patient)	2.0
Community mobilisation (per patient)	2.7
Evaluation, referral system (per patient)	0.9
Implementation of community DOT	
Outpatient DOT visit to volunteer	0
Supervision by sub-county health workers (SCHWs), per patient	9.3
District supervision (per patient)	19.3
Zonal supervision (per patient)	12.6
National supervision (per patient)	17.7

*of this total, US$ 0.5 is for food

TABLE 3 PATIENT COSTS ASSOCIATED WITH TB TREATMENT, NEW SMEAR-POSITIVE PATIENTS, KIBOGA DISTRICT, 1998 US$ [95% CONFIDENCE INTERVAL]

Cost item (n=94)	Average travel cost	Average time cost (average time taken)	Average total cost
Day in hospital	N.A.	One day	1.3*
Outpatient DOT visit to volunteer, where volunteer chosen for supervision	0	0.08** [0,0.15] (22 minutes)	0.1 [0,0.15]
Outpatient visit to nearest health facility	2.1 [1.8,2.4]	0.5 [0.4,0.6] (110)	2.6 [2.2,3.0]

* based on average income of US$32.7 per month and assumption people work 26 days per month
** based on assumption people work 6 hours per day

TABLE 4 VOLUNTEER COSTS IN KIBOGA DISTRICT, 1998 US$ [95% CONFIDENCE INTERVAL]

Cost item (n=94)	Average Cost (time taken unless specified)
Time taken to observe treatment	79 minutes per patient per week [68,90] for 30 weeks
Motivating patients	340 minutes per patient [298,382]
Time spent receiving training per volunteer	1 day
Time spent receiving training per patient	One third of one day*
Average monetary expenditure to observe treatment per patient	Negligible at US$0.03 per patient [0.005,0.055]
All per patient	US$11**

* each volunteer supports an average of 3 patients per year
** time valued at US$0.22 per hour, based on reported average incomes

Table 5 Average cost per patient treated for new smear-positive pulmonary TB patients in Kiboga district, alternative strategies, 1998 US$ (% column total[1])

Conventional hospital-based care					Community-based care					
Cost item	Health system Hospital	DHS[2]	Patient	Total	Cost item	Health system Hospital	DHS[2]	Patient	Volunteer[3]	Total
60 days in hospital	360 (99)	0 (0)	78 (86)	438 (86)	19 days in hospital	114 (100)	0 (0)	25 (47)	0 (0)	139 (48)
Outpatient DOT visits	N.A.	0 (0)	N.A.	0 (0)	184 outpatient DOT visits[4]	0 (0)	0 (0)	15 (28)	7 (78)	22 (8)
5 visits to collect drugs	4 (1)	0 (0)	13 (14)	17 (3)	5 visits to collect drugs	0 (0)	4 (4)	13 (25)	0 (0)	17 (6)
Drugs	0 (0)	32 (58)	0 (0)	32 (6)	Drugs	0 (0)	32 (28)	0 (0)	0 (0)	32 (11)
District supervision	0 (0)	16 (29)	0 (0)	16 (3)	District supervision	0 (0)	19 (17)	0 (0)	0 (0)	19 (7)
Zonal supervision	0 (0)	7 (13)	0 (0)	7 (1)	Zonal supervision	0 (0)	13 (12)	0 (0)	0 (0)	13 (4)
NTLP staff supervision	0 (0)	N.A.	N.A.	0 (0)	NTLP staff supervision	0 (0)	18 (16)	0 (0)	0 (0)	18 (6)
Supervision, by SCHWs	0 (0)	N.A.	N.A.	0 (0)	Supervision by SCHWs	0 (0)	9 (8)	0 (0)	0 (0)	9 (3)
Training associated with community-based care	0 (0)	N.A.	N.A.	0 (0)	Training associated with community-based care	0 (0)	9 (8)	0 (0)	2 (22)	11 (4)
Miscellaneous[5]	0 (0)	N.A.	N.A.	0 (0)	Miscellaneous[5]	0 (0)	9 (8)	0 (0)	0 (0)	9 (3)
All	364	55	91	510	All	114	113	53	9	289

1 *percentage totals do not always sum to 100 due to rounding errors*
2 *District Health Services*
3 *total cost US$9 (rather than US$11) because average cost per patient multiplied by the proportion of patients who chose community-based care (81% during the years 1998 and 19991)*
4 *i.e. 226 visits for those patients selecting community-based care (CBC) multiplied by the proportion of all patients choosing CBC*
5 *includes initial contact with district health team, situational analysis, community mobilisation, new TB register, evaluation of referral system*

FIGURE 1 COMPARISON OF COSTS PER PATIENT TREATED FOR ALTERNATIVE STRATEGIES, NEW SMEAR-POSITIVE PULMONARY TB PATIENTS, KIBOGA DISTRICT.

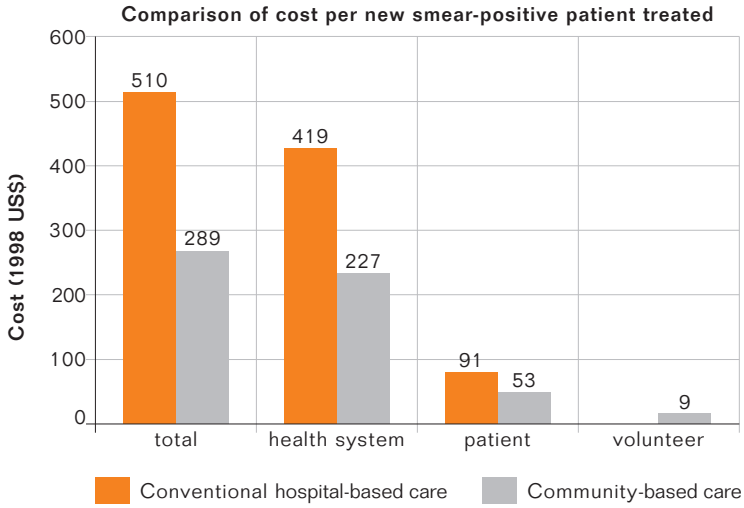
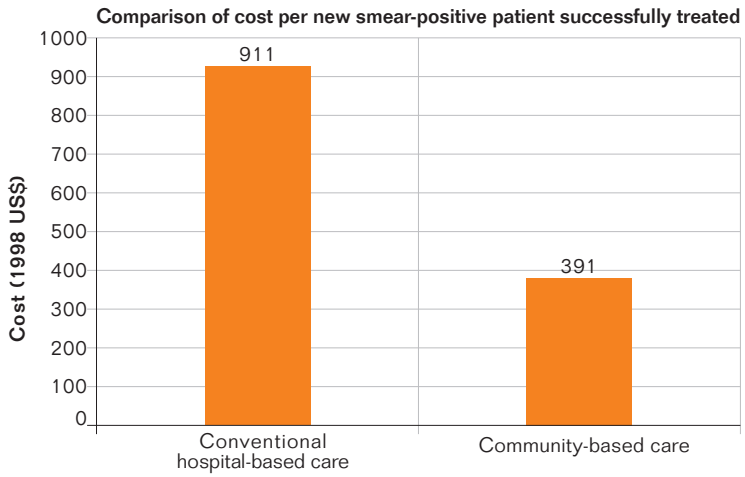


FIGURE 2 COST-EFFECTIVENESS OF TREATMENT, ALTERNATIVE STRATEGIES, KIBOGA DISTRICT.



Ndola, Zambia

TABLE 1 CASE FINDING OF ADULT PATIENTS (15 YEARS AND OLDER) BY QUARTER FROM FEBRUARY 1998 TO SEPTEMBER 1999

		Intervention population: Chipulukusu				Control population: Twapia			
Year	Quarter	New smear positive (%)	New smear negative cases (%)	New extra -pulmonary cases (%)	Total	New smear positive (%)	New smear negative cases (%)	New extra-pulmonary cases (%)	Total
1998	1	3 (100%)	0	0	3	13 (50%)	12 (48%)	0	25
1998	2	6 (85%)	0	1 (14%)	7	21 (61%)	12 (35%)	1 (2%)	34
1998	3	17 (85%)	2 (10%)	1 (5%)	20	11 (39%)	14 (50%)	3 (10%)	28
1998	4	14 (56%)	0	11 (44%)	25	16 (52%)	10 (37%)	1 (3%)	27
	Total 1998	**40 (72%)**	**2 (3%)**	**13 (23%)**	**55**	**61 (53%)**	**48 (42%)**	**5 (4%)**	**114**
1999	1	9 (64%)	1 (7%)	4 (28%)	14	7 (41%)	8 (47%)	2 (11%)	17
1999	2	11 (68%)	1 (6%)	4 (25%)	16	8 (44%)	9 (50%)	1 (5%)	18
1999	3	12 (63%)	0 (6%)	7 (36%)	19	20 (74%)	7 (25%)	0	27
1999	4								
	Total 1999	**32 (65%)**	**2 (4%)**	**15 (30%)**	**49**	**35 (56%)**	**24 (38%)**	**3 (4%)**	**62**
	Overall total	**72 (69%)**	**4 (3%)**	**28 (26%)**	**104**	**96 (54%)**	**72 (40%)**	**8 (4%)**	**176**

TABLE 2 TREATMENT OUTCOMES FOR NEW SMEAR POSITIVE TB CASES INTERVENTION POPULATION (CHIPULUKUSU) CONTROL POPULATION (TWAPIA), NDOLA

		Intervention population: Guguletu (DOT options include community supervision)							Control population: Nyanga (DOT options do not include community supervision)						
Year	Quarter	Cured (%)	Treatment completed (%)	Died (%)	Failure (%)	Treatment interrupted (defaulted) (%)	Transfer (%)	Total	Cured (%)	Treatment completed (%)	Died (%)	Failure (%)	Treatment interrupted (defaulted) (%)	Transfer (%)	Total
1998	1	2	0	0	0	0	1	3	2	5	2	0	2	2	13
1998	2	6	0	0	0	0	0	6	7	4	7	0	3	0	21
1998	3	8	1	4	0	1	3	17	4	0	1	0	3	3	11
1998	4	5	1	6	0	1	1	14	4	4	2	0	4	2	16
	Total	**21 (52%)**	**2 (5%)**	**10 (25%)**	**0**	**2 (5%)**	**5 (12%)**	**40**	**17 (27%)**	**13 (21%)**	**12(19%)**	**0**	**12 (19%)**	**7 (11%)**	**61**
1999	1	3	1	3	0	1	1	9	1	4	1	0	1	0	7
1999	2	8	0	1	0	2	0	11	2	2	3	0	1	0	8
1999	3	7	2	2	0	1	0	12	0	8	2	0	8	2	20
	Total	**18 (56%)**	**3 (9%)**	**6 (18%)**	**0**	**4 (12%)**	**1 (3%)**	**32**	**3 (8%)**	**14 (40%)**	**6 (17%)**	**0**	**10 (28)**	**2 (5%)**	**35**
	Overall total	**39 (54%)**	**5 (6%)**	**16 (22%)**	**0**	**6 (8%)**	**6 (8%)**	**72**	**20 (20%)**	**27 (28%)**	**18 (18%)**	**0**	**22 (22%)**	**9 (9%)**	**96**

Guguletu, Cape Town, South Africa

TABLE 1 TREATMENT OUTCOMES FOR NEW SMEAR POSITIVE PATIENTS

Year	Quarter	Intervention population: Guguletu (DOT options include community supervision)							Control population: Nyanga (DOT options do not include community supervision)						
		Cured (%)	Treatment completed (%)	Failure (%)	Died (%)	Treatment interrupted (%)	Transfer (%)	Total	Cured (%)	Treatment completed (%)	Failure (%)	Died (%)	Treatment interrupted (%)	Transfer (%)	Total
1998	1	76 (68)	7 (6)	0	0	18 (16)	11 (10)	112	36 (47)	14 (18)	0	4 (5)	17 (22)	5 (7)	76
	2	43 (63)	5 (7)	0	4 (6)	10 (15)	6 (9)	68	19 (38)	9 (18)	0	2 (4)	16 (32)	4 (8)	50
	3	50 (50)	10 (10)	0	3 (3)	22 (22)	15 (15)	100	29 (48)	10 (17)	0	2 (3)	15 (25)	4 (7)	60
	4	51 (55)	9 (10)	0	1 (1)	17 (19)	14 (15)	92	34 (44)	14 (18)	1 (1)	6 (8)	15 (20)	7 (9)	77
	Total	**220**	**31**	**0**	**8**	**67**	**46**	**372**	**118**	**47**	**1**	**14**	**63**	**20**	**263**
1999	1	56 (58)	15 (16)	0	3 (3)	9 (9)	13 (14)	96	26 (48)	8 (15)	0	4 (7)	8 (15)	8 (15)	54
	2	40 (52)	6 (8)	1 (1)	3 (4)	17 (22)	10 (13)	77	30 (60)	6 (12)	1 (2)	1 (2)	8 (16)	4 (8)	50
	3	79 (67)	8 (7)	0	2 (2)	25 (21)	4 (3)	118	33 (53)	6 (10)	0	5 (8)	10 (16)	8 (13)	62
	4	64 (52)	8 (7)	0	6 (5)	28 (23)	18 (14)	124	38 (58)	10 (15)	0	1 (2)	13 (20)	4 (6)	66
	Total	**239**	**37**	**1**	**14**	**79**	**45**	**415**	**127**	**30**	**1**	**11**	**39**	**24**	**232**
	TOTAL	**459 (58)**	**68 (9)**	**1 .1**	**22 (3)**	**146 (19)**	**91 (12)**	**787**	**245 (50)**	**77 (12)**	**2 (0.4)**	**25 (5)**	**102 (21)**	**44 (9)**	**495**

TABLE 2 TREATMENT OUTCOMES FOR RE-TREATMENT SMEAR POSITIVE PATIENTS, CAPE TOWN

		Intervention population: Guguletu (DOT options include community supervision)							Control population: Nyanga (DOT options do not include community supervision)						
Year	Quarter	Cured (%)	Treatment completed (%)	Failure (%)	Died (%)	Treatment interrupted (%)	Transfer (%)	Total	Cured (%)	Treatment completed (%)	Failure (%)	Died (%)	Treatment interrupted (%)	Transfer (%)	Total
1998	1	22 (49)	8 (18)	0	2 (4)	10 (22)	3 (7)	45	10 (35)	2 (7)	1 (3)	1 (3)	13 (45)	2 (7)	29
	2	19 (54)	3 (9)	0	1 (3)	9 (26)	3 (9)	35	10 (29)	10 (29)	0	3 (9)	10 (29)	2 (6)	35
	3	13 (30)	6 (14)	0	7 (16)	12 (27)	6 (14)	44	13 (35)	5 (14)	0	3 (8)	13 (35)	3 (8)	37
	4	28 (46)	7 (12)	1 (2)	7 (12)	16 (26)	2 (3)	61	13 (45)	10 (35)	0	1 (3)	4 (14)	1 (3)	29
	Total	**82**	**24**	**1**	**17**	**47**	**14**	**185**	**46**	**27**	**1**	**8**	**40**	**8**	**130**
1999	1	21 (57)	2 (5)	0	1 (3)	10 (27)	3 (8)	37	5 (20)	2 (8)	0	0	11 (44)	7 (28)	25
	2	15 (47)	2 (6)	0	3 (9)	7 (33)	5 (16)	32	6 (29)	6 (29)	0	1 (5)	7 (33)	1 (5)	21
	3	21 (40)	7 (13)	1 (2)	5 (9)	13 (25)	6 (11)	53	12 (50)	3 (13)	0	0	6 (25)	3 (13)	24
	4	18 (43)	5 (12)	0	3 (7)	11 (26)	5 (12)	42	9 (43)	5 (24)	0	1 (5)	3 (14)	3 (14)	21
Total	**75**	**16**	**1**	**12**	**41**	**19**	**164**	**32**	**16**	**0**	**2**	**27**	**14**	**91**	
TOTAL		**157 (47)**	**40 (11)**	**2 (.4)**	**29 (8)**	**88 (25)**	**33 (9)**	**349**	**78 (35)**	**43 (20)**	**1 (1)**	**10 (5)**	**67 (30)**	**22 (10)**	**221**

TABLE 3 Treatment outcomes for smear negative and extra-pulmonary patients, Cape Town

		Intervention population: Guguletu (DOT options include community supervision)					Control population: Nyanga (DOT options do not include community supervision)				
Year	Quarter	Treatment completed (%)	Died (%)	Treatment interrupted (%)	Transfer (%)	Total	Treatment completed (%)	Died (%)	Treatment interrupted (%)	Transfer (%)	Total
1998	1	34 (68)	2 (4)	8 (16)	6 (12)	50	21 (68)	2 (7)	4 (13)	4 (13)	31
	2	42 (71)	6 (10)	5 (9)	6 (10)	59	13 (52)	0	7 (28)	5 (20)	25
	3	38 (66)	3 (5)	13 (22)	4 (7)	58	9 (39)	3 (13)	7 (30)	4 (17)	23
	4	41 (63)	7 (11)	13 (20)	4 (6)	65	20 (65)	3 (10)	6 (19)	2 (7)	31
	Total	**155**	**18**	**39**	**20**	**232**	**63**	**8**	**24**	**15**	**110**
1999	1	35 (67)	6 (12)	7 (14)	4 (8)	52	19 (63)	5 (17)	4 (13)	2 (7)	30
	2	38 (62)	4 (7)	9 (15)	10 (16)	61	19 (73)	2 (8)	2 (8)	3 (12)	26
	3	45 (61)	8 (11)	15 (21)	6 (8)	74	10 (44)	3 (13)	7 (30)	3 (13)	23
	4	58 (60)	11 (12)	16 (17)	9 (9)	96	28 (88)	1 (3)	3 (9)	0	32
	Total	**176**	**29**	**47**	**29**	**281**	**76**	**11**	**16**	**8**	**111**
	TOTAL	**331 (65)**	**47 (9)**	**86 (17)**	**49 (10)**	**513**	**139 (63)**	**19 (9)**	**40 (18)**	**23 (10)**	**221**

TABLE 4 SUMMARY TABLE OF TREATMENT OUTCOMES FOR ALL PATIENTS, CAPE TOWN

	Intervention population: Guguletu (DOT options include community supervision)							Control population: Nyanga (DOT options do not include community supervision)						
	Cured (%)	Treatment completed (%)	Failure (%)	Died (%)	Treatment interrupted (%)	Transfer (%)	Total	Cured (%)	Treatment completed (%)	Failure (%)	Died (%)	Treatment interrupted (%)	Transfer (%)	Total
Smear positive (new)	459 (58)	68 (9)	1 (0.1)	22 (3)	146 (19)	91 (12)	787	245 (50)	77 (12)	2 (0.4)	25 (5)	102 (21)	44 (9)	495
Smear positive (retreatment)	157 (47)	40 (11)	2 (0.4)	29 (8)	88 (25)	33 (9)	349	78 (35)	43 (20)	1 (1)	10 (5)	67 (30)	22 (10)	221
Smear negative and EPTB	-	331 (65)	-	47 (9)	86 (17)	49 (10)	513	-	139 (63)	-	19 (9)	40 (18)	23 (10)	221

Table 5 Site of treatment supervision, Cape Town

		Intervention population: Guguletu (DOT options include community supervision)						Control population: Nyanga (DOT options do not include community supervision)					
Year	TB Type	Hospital inpatient	Hospital outpatient	Health Centre	Community	Other	Total	Hospital inpatient	Hospital outpatient	Health Centre	Community	Other **	Total
1998	New smear positive	1		179	173	9	372			263			263
	New smear negative	0		37	14	5	56			23			23
	New EPTB	0		71	15	9	95			49			49
	Smear Positive ReRx	8		144	60	3	185			130			130
	Other	6		91	31	17	145			98			98
	Total	**15 (2)**	**0**	**492 (58)**	**293 (34)**	**53 (6)**	**853**	**0**	**0**	**563**	**0**	**0**	**563**
1999	New smear positive	8		181	196	30	415			232			232
	New smear negative	0		19	32	10	61			21			21
	New EPTB	0		48	67	14	130			59			59
	Smear Positive ReRx	7		89	63	5	164			91			91
	Other *	6		86	81	9	182			103			103
	Total	**21 (2)**	**0**	**423 (44)**	**439 (46)**	**68 (7)**	**951**	**0**	**0**	**506**	**0**	**0**	**506**
	TOTAL	**36 (2)**	**0**	**915 (51)**	**732 (41)**	**80 (4)**	**1804**	**0**	**0**	**1069**	**0**	**0**	**1069**

* Other = Patients transferred in; retreatment smear negative; other extra-pulmonary TB, PTB with no pretreatment smear result
** Workplace, school, home

TABLE 6 COMPARISON OF TREATMENT OUTCOMES BETWEEN CLINIC AND COMMUNITY DOT IN GUGULETU: NEW SMEAR-POSITIVE PULMONARY TB PATIENTS, JANUARY 1998 – DECEMBER 1999

DOT option	Cured (%)	Treatment completed (%)	Failure (%)	Died (%)	Treatment interrupted (%)	Transfer (%)	Total
Clinic	164 (46)	26 (7)	0	11 (3)	90 (25)	69 (19)	360 (49)
Community	265 (72)	34 (9)	1 (0.3)	3 (1)	48 (13)	18 (5)	369 (51)
Total	**429 (59)**	**60 (8)**	**1 (0.1)**	**14 (2)**	**138 (19)**	**87 (12)**	**729**

TABLE 7 COMPARISON OF TREATMENT OUTCOMES BETWEEN CLINIC AND COMMUNITY DOT IN GUGULETU: RETREATMENT SMEAR-POSITIVE PULMONARY TB PATIENTS, JANUARY 1998 – DECEMBER 1999

DOT option	Cured (%)	Treatment completed (%)	Failure (%)	Died (%)	Treatment interrupted (%)	Transfer (%)	Total
Clinic	71 (35)	24 (12)	1 (1)	20 (10)	61 (30)	26 (13)	203 (62)
Community	78 (63)	13 (11)	1 (1)	3 (2)	22 (18)	6 (5)	123 (38)
Total	**149 (46)**	**37 (11)**	**2 (1)**	**23 (7)**	**83 (26)**	**32 (10)**	**326**

TABLE 8 COSTS OF MANAGING A NEW SMEAR-POSITIVE PULMONARY TB PATIENT FROM DIAGNOSIS TO COMPLETION OF TREATMENT, ALTERNATIVE STRATEGIES, 1997US$ (% COLUMN TOTAL*), CAPE TOWN

Cost Component	GUGULETU (intervention)			NYANGA (control)
	Clinic (n=248)	Community supervision by lay-person "treatment supporter" (n=261)	Workplace-based supervision (n=16)	Clinic (n=367)
Health services				
1 clinic visit, initial diagnosis	7 (1)	7 (2)	7 (3)	8 (1)
10 clinic DOT visits, first 10 days	37 (5)	37 (12)	37 (17)	41 (5)
120 DOT visits (when clinic used for DOT)	444 (63)	N.A.	N.A.	496 (64)
3 clinic visits for monitoring	21 (3)	21 (7)	21 (10)	24 (3)
Drugs	52 (7)	52 (17)	52 (24)	52 (7)
3 sputum smears	8 (1)	8 (3)	8 (4)	8 (1)
2 X-rays	24 (3)	24 (8)	24 (11)	24 (3)
Training on revised NTP	1 (0.1)	1 (0.1)	1 (0.5)	1 (0.1)
Sub-total, health services	594	150	150	654
NGO				
120 DOT visits (when community supervision chosen)	N.A.	52 (17)	0 (0)	N.A.
Overall organization/supervision of community-based treatment	N.A.	65 (21)	51 (23)	N.A.
Training of treatment supporters (US$5.2 per treatment supporter trained)	N.A.	1 (0.3)	1 (0.5)	N.A.
Sub-total, NGO		118	52	
Patient				
14 clinic visits	11 (2)	11 (4)	11 (5)	12 (2)
120 DOTS visits	94 (13)	31 (10)	0 (0)	99 (13)
Sub-total, patients	105	42	11	111
Department of Social Welfare				
Disability grant (average per patient)	4 (0.5)	4 (1)	4 (2)	4 (0.5)
TOTAL, all costs	703	314	217	769
Average, across all sites used for DOTS in Guguletu	495			769

* Percentages do not always add up to 100 due to counting errors.

TABLE 9 COSTS OF MANAGING A RETREATMENT SMEAR-POSITIVE PULMONARY TB PATIENT FROM DIAGNOSIS TO TREATMENT COMPLETION, ALTERNATIVE STRATEGIES, 1997 US$ (% TOTAL*) CAPE TOWN

Cost Component	GUGULETU			NYANGA
	Clinic (n=150)	Community supervision by lay-person "treatment supporter" (n=86)	Workplace-based supervision (n=4)	Clinic (n=176)
Health services				
1 clinic visit, initial diagnosis	7 (1)	7 (1)	7 (2)	8 (1)
44 clinic DOT visits, first 2 months	163 (17)	163 (23)	163 (36)	182 (17)
30 DOT visits (when clinic used for DOT)	480 (49)	N.A.	N.A.	537 (50)
4 clinic visits for monitoring	29 (3)	29 (5)	29 (6)	31 (3)
Drugs	111 (11)	111 (20)	111 (24)	111 (10)
3 sputum smears	8 (1)	8 (1)	8 (2)	8 (1)
2 X-rays	24 (2)	24 (4)	24 (5)	24 (2)
1.3 culture tests	7 (1)	7 (1)	7 (2)	7 (1)
1.3 drug sensitivity tests	10 (1)	10 (2)	10 (2)	10 (1)
Training on revised NTP	1 (0.1)	1 (0.2)	1 (0.2)	1 (0.5)
Sub-total, health services	840	360	360	919
NGO				
130 DOT visits (when community supervision chosen)	N.A.	57 (10)	0 (0)	N.A.
Overall organization/supervision of community-based treatment	N.A.	66 (12)	51 (11)	N.A.
Training of treatment supporters (US$5.2 per treatment supporter trained)	N.A.	1 (0.2)	1 (0.2)	N.A.
Sub-total, NGO		123	52	
Patient				
49 clinic visits	38 (4)	38 (7)	38 (8)	40 (4)
130 DOTS visits	102 (10)	34 (6)	0	107 (10)
Sub-total, patients	140	72	38	148
Department of Social Welfare				
Disability grant (average per patient)	4 (0.4)	4 (1)	4 (1)	4 (0.3)
TOTAL, all costs	984	559	454	1 070
Average, across all sites used for DOTS in Guguletu	823			1 070

* Percentages do not always sum to 100 due to rounding errors.

TABLE 10 COST-EFFECTIVENESS OF CARE FOR NEW SMEAR-POSITIVE PULMONARY TB PATIENTS, ALTERNATIVE SUPERVISION STRATEGIES (1997 US$), CAPE TOWN

Supervision strategy	Cost to manage a patient from diagnosis to treatment completion (a)	Successful treatment rate (b)	Cost per patient successfully treated (c)**
Clinic-based care, Guguletu (n = 248)	703	54	1302
Community-based care using lay-person "treatment supporter" (n = 261)	314	80	392
Workplace-based care (n = 16)	217	81	268
Guguletu, overall* (n = 525)	495	68	726
Clinic-based care, Nyanga (n = 367)	769	64	1201

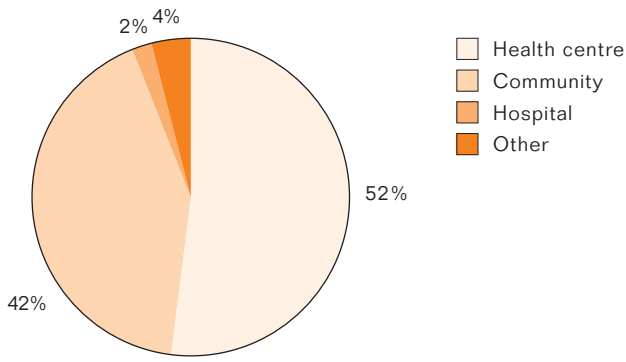
* i.e. costs and successful treatment rates are averages for the Guguletu area as a whole, based on the numbers of patients using each treatment strategy and the cure and treatment success rates achieved with them
** (c) calculated as (a x 100) ÷ (b)

TABLE 11 COST-EFFECTIVENESS OF CARE FOR RETREATMENT TB PATIENTS, ALTERNATIVE SUPERVISION STRATEGIES (1997 US$), CAPE TOWN

Supervision strategy	Cost to manage a patient from diagnosis to treatment completion (a)	Successful treatment rate (b)	Cost per patient successfully treated (c)**
Clinic-based care, Guguletu (n = 150)	984	49	2008
Community-based care using lay-person "treatment supporter" (n = 86)	559	73	766
Workplace-based care (n = 4)	454	75	605
Guguletu, overall* (n = 240)	823	58	1 419
Clinic-based care, Nyanga (n = 176)	1070	52	2058

* i.e. costs and successful treatment rates are averages for the Guguletu area as a whole, based on the numbers of patients using each treatment strategy and the cure and treatment success rates achieved with them
** (c) calculated as (a x 100) ÷ b

FIGURE 1 CHOICE OF SITES FOR DOT, CAPE TOWN



Hlabisa, South Africa

TABLE 1 COMPARISON OF OUTCOMES FOR TB PATIENTS BEING TREATED BY TRADITIONAL HEALERS WITH OUTCOMES FOR PATIENTS BEING TREATED BY ALL OTHER CATEGORIES OF DOTS SUPERVISORS.

	Patients being supervised by people other than traditional healers				Patients being supervised by traditional healers			
	Sputum positive	Sputum negative	EPTB	All	Sputum positive	Sputum negative	EPTB	All
Completed treatment (%)	98 (68)	20 (54)	41 (71)	159 (67)	31 (91)	6 (86)	10 (83)	47 (89)
Died (%)	15 (11)	15 (41)	12 (21)	42 (18)	1 (3)	0 (0)	2 (17)	3 (6)
Defaulted (%)	22 (15)	1 (3)	2 (3)	25 (10)	2 (6)	1 (14)	0 (0)	3 (6)
Transferred (%)	9 (6)	1 (3)	3 (5)	13 (5)	0 (0)	0 (0)	0 (0)	0 (0)

TABLE 2 CASE FINDING RESULTS FOR APRIL 1999 – DEC 2000

	Non-intervention area			Intervention area		
	New Patients (%)	Previous treatment completed (%)	Previous treatment interrupted (%)	New Patients (%)	Previous treatment completed (%)	Previous treatment interrupted (%)
Sputum +	1 370	334	86	202	33	15
Sputum -	341	77	29	42	12	4
Extra-pulmonary	762	37	22	90	7	3
Total	**2 473**	**448**	**137**	**334**	**52**	**22**

FIGURE 1 CHOICE OF SUPERVISION SITES, HLABISA

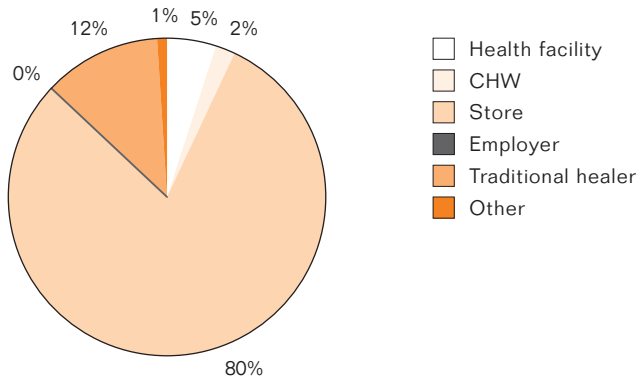


TABLE 3 COMPARISON OF TREATMENT OUTCOMES BETWEEN INTERVENTION AREAS AND THE REMAINDER OF HLABISA HEALTH DISTRICT (% COLUMN TOTAL)

	Treatment outcomes for patients being treated outside the intervention area				Treatment outcomes for patients being treated within the intervention area			
	Sputum positive	Sputum negative	EPTB	All	Sputum positive	Sputum negative	EPTB	All
Completed treatment (%)	668 (54)	119 (42)	305 (57)	1092 (53)	129 (74)	27 (60)	53 (74)	209 (72)
Died (%)	183 (15)	76 (27)	73 (14)	332 (16)	16 (9)	15 (33)	14 (19)	45 (15)
Defaulted (%)	97 (8)	26 (9)	66 (12)	189 (9)	22 (13)	2 (4)	2 (3)	26 (9)
Transferred (%)	295 (24)	66 (23)	94 (18)	455 (22)	8 (4)	1 (2)	3 (4)	12 (4)

Known outcomes for non-intervention subdistricts = 2068 out of 2442 patients (84.68%)
Known outcomes for intervention subdistricts = 292 out of 374 patients (78.07%)

TABLE 4 NUMBER (%) OF SUPERVISORS USED IN THE STUDY AREAS BETWEEN APRIL 1999 – DEC 2000, HLABISA DISTRICT

Type of supervisor	Non-intervention sub-districts (N, %)	Intervention sub-districts (N, %)
Health facilities	599 (25)	17 (5)
Community Health Worker	625 (26)	8 (2)
Store	981 (40)	298 (80)
Employer	65 (3)	1 (0.3)
Other lay person	72 (3)	0 (0)
Traditional Healer	6 (0.2)	45 (12)
Other	94 (4)	5 (1)

Five districts, Malawi

TABLE 1 TREATMENT OUTCOME OF NEW PATIENTS ON ORAL AMBULATORY TREATMENT BY TYPE OF TB.

	Smear+ve PTB	Smear-ve PTB	EPTB	Total
Number Registered	2671	2211	1453	6335
Outcome at 2 months				
Alive	2322 (87%)	1670 (76%)	1102 (76%)	5094 (80%)
Died	274 (10%)	222 (10%)	157 (11%)	653 (10%)
Defaulted	25 (1%)	50 (2%)	40 (3%)	115 (2%)
Transfer out	33 (1%)	70 (3%)	55 (4%)	158 (3%)
Stopped[a]	0	2	7	9
Unknown[b]	17 (1%)	197 (9%)	92 (6%)	306 (5%)
Outcome at 8 months				
Completed treatment[c]	1785 (67%)	1124 (51%)	813 (56%)	3722 (59%)
Died	614 (23%)	432 (20%)	259 (18%)	1305 (21%)
Defaulted	106 (4%)	189 (9%)	165 (11%)	460 (7%)
Transfer out	121 (4%)	136 (6%)	100 (7%)	357 (6%)
Failure	26			
Stopped[a]	0	3	9	12
Unknown[b]	19 (1%)	327 (14%)	107 (8%)	453 (7%)

[a] treatment stopped because diagnosis of TB considered incorrect
[b] unknown outcome because treatment cards lost and no record in register
[c] includes 1672 smear+ve PTB patients who were cured (ie whose sputum smears were negative at 8 months) and 113 smear+ve PTB patients who completed treatment without a smear result at 8 months.

TABLE 2 2-MONTH TREATMENT OUTCOME OF NEW PATIENTS ACCORDING TO SITE OF INITIAL PHASE OF TREATMENT, 5 DISTRICTS, MALAWI

	Guardian	Health Centre	Hospital Out-patient	Hospital In-patient
All types of TB Number	1759	1465	753	1813
2-month outcome:				
Alive	1644 (94%)	1360 (93%)	686 (91%)	1177 (65%)
Dead	57 (3%)	71 (5%)	47 (6%)	473 (26%)
Defaulted	37 (2%)	17 (1%)	13 (2%)	44 (2%)
Transfer out	21 (1%)	17 (1%)	7 (1%)	110 (6%)
Stopped[a]	0	0	0	9 (1%)
Smear+ve PTB Number	216	992	416	974
2-month outcome:				
Alive	207 (96%)	934 (94%)	395 (96%)	732 (75%)
Died	7 (3%)	39 (4%)	14 (3%)	212 (22%)
Defaulted	1	9 (1%)	5 (1%)	10 (1%)
Transfer out	1	10 (1%)	2	20 (2%)
Smear-ve PTB Number	937	284	206	493
2-month outcome:				
Alive	873 (93%)	257 (90%)	180 (87%)	270 (55%)
Died	34 (4%)	18 (6%)	18 (9%)	151 (31%)
Defaulted	20 (2%)	5 (2%)	5 (3%)	18 (4%)
Transfer out	10 (1%)	4 (2%)	3 (1%)	52 (10%)
Stopped[a]	0	0	0	2
EPTB Number	606	189	131	346
2-month outcome:				
Alive	564 (93%)	169 (89%)	111 (85%)	175 (51%)
Died	16 (3%)	14 (7%)	15 (11%)	110 (32%)
Defaulted	16 (3%)	3 (2%)	3 (2%)	16 (5%)
Transfer out	10 (1%)	3 (2%)	2 (2%)	38 (10%)
Stopped[a]	0	0	0	7 (2%)

[a] treatment stopped because diagnosis of TB considered incorrect

TABLE 3 SPUTUM SMEAR STATUS AT THE END OF THE INITIAL PHASE OF TREATMENT IN NEW SMEAR-POSITIVE PTB PATIENTS WHO WERE ALIVE AT 2 MONTHS ACCORDING TO SITE OF INITIAL PHASE OF TREATMENT, 5 DISTRICTS, MALAWI

	Guardian Based	Health Centre	Hospital Out-patient	Hospital In-patient
Alive at 2 months	207	934	395	732
Smear-results at 8 weeks				
Sputum smear -ve	156 (75%)	834 (89%)	358 (91%)	646 (88%)
Sputum smear +ve	23 (11%)	34 (4%)	15 (3%)	60 (8%)
Smears not done	28 (14%)	66 (7%)	22 (6%)	26 (4%)
Smear-results at 12 weeks in patients who were still smear+ve at 8 weeks				
Total number	23	34	15	60
Sputum smear -ve	5 (22%)	12 (35%)	12 (80%)	22 (37%)
Sputum smear +ve	1 (4%)	2 (6%)	1 (7%)	10 (17%)
Smears not done	17 (74%)	20 (59%)	2 (13%)	28 (46%)

TABLE 4 8-MONTH TREATMENT OUTCOMES FOR NEW PATIENTS ACCORDING TO SITE OF INITIAL PHASE OF TREATMENT, 5 DISTRICTS, MALAWI

	Guardian	Health Centre	Hospital Out-patient	Hospital In-patient
Smear+ve PTB Number	216	992	416	974
8-month outcome				
Treatment complete[a]	153 (71%)	740 (74%)	318 (76%)	538 (55%)
Died	39 (18%)	175 (18%)	59 (14%)	329 (34%)
Defaulted	10 (5%)	26 (3%)	24 (6%)	40 (4%)
Transfer out	12 (6%)	41 (4%)	14 (4%)	52 (5%)
Failed	1	9 (1%)	1	15 (2%)
Unknown[b]	1	1	0	0
Smear-ve PTB Number	937	284	206	493
8-month outcome				
Treatment Completed	573 (61%)	164 (58%)	133 (65%)	199 (40%)
Died	124 (13%)	58 (20%)	39 (19%)	200 (41%)
Defaulted	102 (11%)	29 (10%)	17 (8%)	27 (6%)
Transfer out	45 (5%)	11 (4%)	14 (7%)	61 (12%)
Stopped[c]	0	0	1	2
Unknown	93 (10%)	22 (8%)	2 (1%)	4 (1%)
EPTB Number	606	189	131	346
8-month outcome				
Treatment Completed	433 (71%)	123 (65%)	75 (57%)	128 (37%)
Died	57 (9%)	35 (19%)	25 (19%)	134 (39%)
Defaulted	72 (12%)	19 (10%)	21 (16%)	32 (9%)
Transfer out	36 (6%)	8 (4%)	9 (7%)	45 (13%)
Stopped	0	1	0	7 (2%)
Unknown	8 (2%)	3 (2%)	1 (1%)	0

a includes patients who were cured (ie whose sputum smears were negative at 8 months) and patients who completed treatment without a smear result
b unknown outcome because treatment cards lost and no record in register
c treatment stopped because diagnosis of TB considered incorrect

METHODOLOGY AND TOOLS FOR A REVIEW OF TB CONTROL SERVICES AT DISTRICT LEVEL PRIOR TO THE INTRODUCTION OF COMMUNITY-BASED DOTS (UGANDA NATIONAL TB AND LEPROSY PROGRAMME)

CONTENTS

**ASK GOOD QUESTIONS ABOUT ESSENTIAL ASPECTS OF TB CONTROL,
COLLECT GOOD DATA TO ANSWER THE QUESTIONS,
USE FINDINGS TO PLAN IMPROVEMENTS.**

1. Introduction and rationale

The National TB and Leprosy Programme (NTLP) achieved full operational coverage of all Districts in Uganda in 1995. In order to build adequate technical capacity, the NTLP trained personnel from District Health Teams, from District Hospitals and from Rural Health Units. Anti-TB drugs, laboratory equipment and reagents, logistics for training, support and supervision were also made available. With annual notifications quickly approaching 30,000 TB cases, the NTLP needed to establish an effective process for the diagnosis and the management of all TB cases, as well as an accurate monitoring system for the evaluation of treatment outcomes.

"TB is a public health emergency". This was not a slogan but was evident, based on daily practice, for all health staff. All medical and public health personnel have given a decisive contribution to establishing modern TB control practices all over Uganda. However, the NTLP quickly realised that an extremely relevant problem hadn't been tackled: the task of making effective anti-TB treatment not only available but actually easily accessible to all patients.

Being treated for TB still means, for most patients, two-months hospitalisation, with all the related negative socio-economic implications. This is followed by treatment at home for six more months, when patients must report regularly to the treatment centre, which is often very far from home, incurring further expenditures (travel, accommodation, etc) and absences from the family.

As a result, many patients do not complete their treatment, exposing themselves to the risk of complications and reactivation of the disease. Meanwhile, health services cannot evaluate treatment outcomes, as they lose contact with patients before treatment completion. And here comes the scenario we must avoid at all costs: the patient is still at risk, health services don't know how effectively TB is controlled, the public doesn't know how well its resources were spent, while TB still poses a threat to thousands of families in Uganda. The risk of multidrug resistant TB (MDR-TB), related to improper use of anti-TB drugs, poses a further threat to everybody.

The introduction of Community-based Directly Observed Treatment with Short-course chemotherapy (CB-DOTS) in a few demonstration districts has answered these problems and concerns in several ways. Within a period of one year, the proportion of patients effectively cured has doubled, treatment has become much more acceptable for patients and their families, the district health services have spent less on hospitalisations and, therefore, more resources have become available for serious cases in need of specialised care.

The NTLP is committed to establishing the new strategy all over the country over the next two years. However, before starting the implementation of CB-DOTS, district health services, led by health and political authorities, need to meet some "pre-conditions" in terms of the quality of services provided. This is extremely important in order to ensure proper treatment of patients, proper use of drugs and to avoid the risk of developing multidrug resistant TB.

This guide provides a logical framework for the assessment of TB control activities within the district health services: the identification and timely correction of any operational pitfall is an essential step to prepare for the implementation of CB-DOTS. We offer this work particularly to the Directors of District Health Services and their colleagues in the District Health Teams (DHTs): CB-DOTS can effectively strengthen their efforts to control TB in their districts, deliver sustainable achievements and provide a valuable and measurable indicator of a successful health sector reform, geared towards the Poverty Eradication Policy of the Government of Uganda.

1.1 Main objectives of a district NTLP review:

- to estimate the TB burden in the District;
- to analyse current TB care services, achievements and problems;
- to discuss the main constraints facing TB control activities;
- to prepare a work plan for CB-DOTS implementation.

1.2 Benefits of a review:

- improved effectiveness of TB control activities;
- raised awareness of the TB situation and an opportunity to strengthen political commitment;
- community mobilization and participation in health care;
- increased problem solving and supervisory skills of participating DHT members.

1.3 The essential components of the DOTS strategy for TB control:

- DOTS is an effective strategy for controlling TB by interrupting TB transmission through correct diagnosis and curative treatment. The 5 components of DOTS provide a framework for analysing and evaluating TB control activities: 1) political commitment; 2) detecting infectious cases by standardized sputum smear microscopy; 3) standardised short-course chemotherapy under DOT; 4) regular, uninterrupted supply of anti-TB drugs; and 5) monitoring system for TB control supervision and evaluation.

1.4 The key elements of the review (based on the 5 key elements of the DOTS strategy):

- Estimating the burden of TB
- Political commitment (TB control strategy and objectives, health structures involved, coverage, financial and human resources)
- Diagnosis (case-finding policy, procedures for diagnosis, laboratory services, case-finding performance)

- Treatment (treatment policies and procedures, treatment outcome)
- Logistics (drugs and other supplies)
- Monitoring and supervision (training and supervision, recording/reporting system)
- Integration within general health services
- Health education activities
- Role of other care providers (private sector, private non-profit institutions, NGOs)
- Capacity within the community and available civil structures

2. PLANNING AND PREPARATION

The review of TB control activities at district level is led by a co-ordinator from the District Health Team and a consultant from the NTLP Central Unit. A preliminary meeting is necessary to discuss the purpose, objectives and methods of the review. The main purpose of the review is a comprehensive analysis of the TB situation. This should provide information to make recommendations, as adherent as possible to the reality of the examined district, on how to strengthen TB control services.

2.1 OBJECTIVES

The objectives are as follows:

- to review the epidemiology of TB
- to review the structure, process and outcome of current TB control activities
- to review TB control services within the current structure of health services management and financing at district level
- to prepare an action plan for CB-DOTS implementation including the review recommendations which are specific to the situation

2.2 PRELIMINARY MEETING

During the meeting the team will set review dates. A district review may typically take 4-5 days, including:

- 1 day to brief the team, review data collection tools, plan logistics and meet local authorities
- 2-3 days for field visits and brief analysis of findings
- 1 day to finalize a summary report of the main findings and recommendations to be presented at the debriefing with local authorities (if possible the same day). The debriefing should ensure wide dissemination of the findings and build consensus on the implementation of CB-DOTS.

Selection of sites for field visits should balance rural and urban locations as well as "well-functioning" or "problem" health units. The visits will involve all levels of the health services (district hospital and laboratory, diagnostic centres, TB patients) and should aim to assess the validity of data and information provided and to observe the delivery of health services.

2.3 Budget

The preliminary meeting will consider all budgetary implications of the review. The budget will include:

- per diems for team members
- transport costs during the review
- hotel costs
- secretarial costs
- equipment and supplies
- refreshments for briefing/debriefing meetings

Summaries of data from district quarterly reports should be available before the review. The last one or two quarterly reports will be validated during the field visits, and during review of the District register at the Director of District Health Services (DDHS) Office.

Standardised data collection tools and checklists are provided in the WHO training modules for TB control at district level.

The DTLS and the DDHS can make other useful background information available (e.g. Annual Reports, District Health Profile).

Briefing and de-briefing meetings during the review should involve political leaders, the District Health Committee Chairman, the DDHS, the Medical Superintendent or Medical Officer with the Laboratory Technologist from the District Hospital and similar cadres from private and mission institutions.

3. Conducting the Review

3.1 Briefing of review team members

The review team usually comprises the District TB/Leprosy Supervisor (DTLS), another member of the DHT, and a member of the NTLP central unit. Depending on the number of people involved, the team may decide to split into smaller teams for the field visits. The team should pay a visit to key district authorities to clarify the purpose and objectives of the review. All team members should have a thorough orientation concerning the data collection tools and methodologies that will be used during the review.

The agenda for briefing of team members may include:

- introduction of review team members
- purpose and objectives of the review
- assignment of specific roles and responsibilities within the team
- discussion of field visits (and their logistics)
- review of data collection tools
- review of available TB/Leprosy district quarterly reports

3.2 Field visits and field visit reports

These visits are carried out in order to observe the TB control system, to interview health workers and patients and to collect quantitative data on TB control performance, gathering information on all components of the TB programme.

Therefore, the visit to a diagnostic/treatment centre will usually focus on:

- case-finding (checking registers for completeness/credibility and evaluation of case management)
- laboratory services (extract data from the laboratory register to evaluate case-finding and assess the quality of laboratory services)
- training and supervision
- logistics (e.g. inventory, storage and records in drug store)
- recording and reporting
- health education, interactions between health workers and patients
- co-ordination with general health services and other treatment providers

Team members will record findings using the data collection tools, identify strengths and weaknesses of the programme, analyse possible reasons for these weaknesses and propose solutions. Interviews with patients provide valuable information concerning the perceived quality of health services (including accessibility, acceptability of TB control services and the constraints to access to care faced by TB suspects and patients). Quantitative data extracted from district/unit registers will be useful for validation of existing quarterly reports.

3.3 Summary findings and recommendations

The team will prepare a brief written report summarising observations, interpretation, analysis, conclusions and recommendations. The team will discuss interpretation of findings with specific attention to programme achievements (case finding and cure rates) and constraints, looking at TB control targets, policies and practices, organization and resources. A **FINAL REVIEW REPORT**, combining observations from all field visits, will discuss quantitative and qualitative data collected. There should be clear recommendations about how to increase the effectiveness of TB control, including an action plan for CB-DOTS implementation.

3.4 Debriefing and dissemination of findings and recommendations

An executive summary of the final review report with the main recommendations will be presented during the debriefing to District authorities. The main messages of the review will be stated clearly.

This summary will include:

- a brief assessment of the burden of TB in the district
- a summary of the main achievements and constraints facing TB control
- a brief statement about the epidemiological, social and economic benefits to the district that will result from effective TB control
- an estimate of additional resources required

Acceptability and feasibility of final recommendations are very important. There should also be agreement on the timeframe for their implementation, with activities that are specific, achievable and time bound.

4. Follow-up and plan for introduction of community-based DOTS

The plan for the introduction of CB-DOTS should provide a guide to the logical flow of activities deemed necessary before starting actual implementation of CB-DOTS at district level. The district TB control review, or situation analysis, is an essential component at the outset. All other activities in preparation for CB-DOTS should take into account the findings and the main recommendations of this initial assessment, and will, therefore, represent the natural follow-up of the review. The whole process may take three full months before the first group of patients starts CB-DOTS. A district may determine that the process will take more or less time. What matters is to plan carefully, set deadlines and keep to them as much as possible. This will keep the momentum gained by the increased awareness of the TB situation as a result of the district TB control review.

A GUIDE FOR TUBERCULOSIS TREATMENT SUPPORTERS

Writing committee:

MONIQUE MUNZ
KARIN BERGSTROM

Stop TB Department
World Health Organization
Geneva, Switzerland

With contributions from:

FABIO LUELMO
DERMOT MAHER
MARIO RAVIGLIONE

Stop TB Department
World Health Organization
Geneva, Switzerland

Patricia Whitesell Shirey
ACT International,
Atlanta, GA, USA

Design:
Marilyn Langfeld

Illustrations:
Janet Petitpierre

1. WHAT IS TUBERCULOSIS?

TB is a disease caused by germs. It spreads most easily when it is in a person's lungs.

Tuberculosis, or TB, is a disease caused by germs. TB germs can settle anywhere in the body. We most often hear about TB of the lungs. The TB germ makes many more germs that damage parts of the person's body, such as the lungs. When the lungs are damaged the person cannot breathe easily. TB can be cured with the right treatment. People who do not get the right treatment can die from TB.

2. WHAT ARE THE SYMPTOMS OF TB?

TB symptoms depend on where the TB germs are in the body. The general symptoms of TB are:

- Fever
- Sweating at night, even when the weather is cold
- Loss of appetite and weight loss
- Tiredness

People with TB have many different symptoms.
The major symptom of TB in the lungs is coughing for more than 2 to 3 weeks.
It is best to go to a health facility for a check-up.

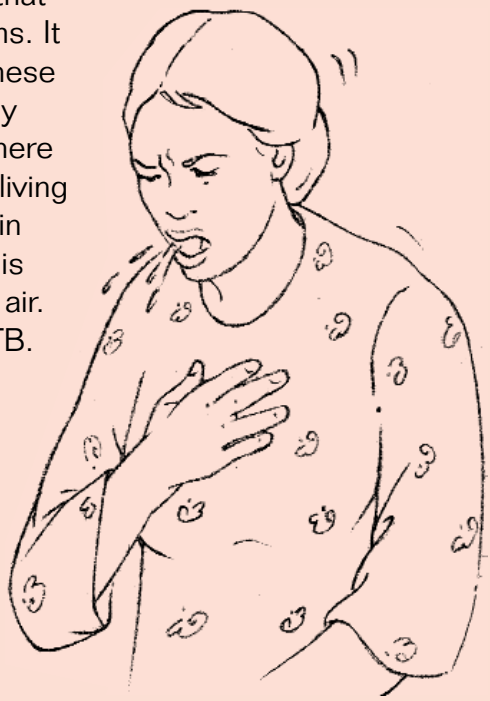
When TB is in the lungs, the major symptom is cough that continues for a long time (more than 2 to 3 weeks). The patient also produces a great deal of sputum (mucus), which may contain blood.

Some symptoms of TB are like symptoms of other illnesses, so it is important that the person gets a check-up at a health facility.

3. HOW IS TB SPREAD?

TB spreads to other people when someone with TB coughs or sneezes.

TB in the lungs is dangerous for other people because it spreads easily from person to person. When a person sick with TB coughs or sneezes, the TB germs are sprayed into the air. These germs get into the lungs of other people breathing the air that contains the germs. It is easy to pass these germs on to family members when there are many people living in a small closed-in space, and there is not enough fresh air. Anyone can get TB.

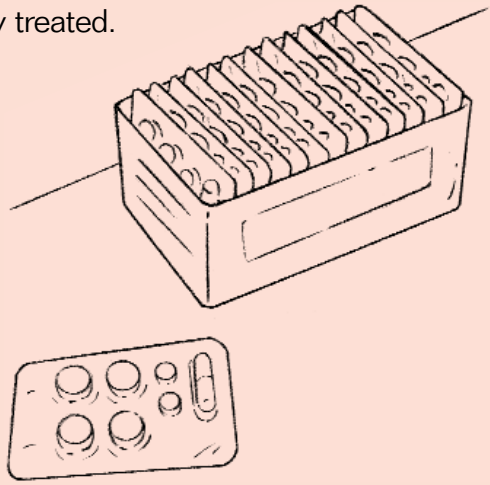


4. WHY IS IT SO IMPORTANT FOR A TB PATIENT TO TAKE THE CORRECT TB DRUGS FOR THE FULL DURATION OF THE TREATMENT?

The drugs that kill the TB germs are called TB drugs. TB can be cured if patients take the TB drugs regularly, on schedule, for the full duration of the treatment, even if they feel better after having taken treatment for some time.

It is important for the TB patient to take all the TB drugs regularly, on schedule, for the full duration of the treatment. Otherwise the disease may become incurable.

TB can cause death if it is not correctly and completely treated.



Patients will continue to transmit TB to others in the family or community if they do not take all their TB drugs.

Taking only some of the drugs or not completing the whole treatment will not cure TB.

It is dangerous not to follow the treatment correctly and take only some of the TB drugs because the disease may then become incurable.

Some people have to spend some time in hospital. Most of the treatment to cure TB can be given at home but must be taken as explained by the health care worker.

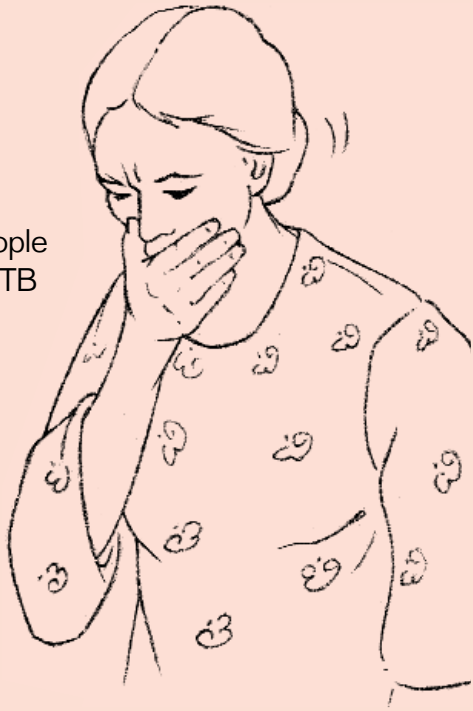
5. HOW CAN A TB PATIENT PREVENT THE SPREAD OF TB?

- By taking treatment and being cured of TB to prevent the spread of the disease to others in the family and in the community.

- By covering the mouth and nose when coughing and sneezing.

Make sure that people in contact with the TB patient, particularly children and adults who are coughing, are examined for TB.

Prevent TB by:
- **taking treatment and being cured of TB**
- **covering the mouth and nose when coughing or sneezing.**



6. WHAT IS YOUR ROLE AS A TB TREATMENT SUPPORTER?

The patient has chosen you as the TB Treatment Supporter and trusts you. Your main role is to make sure that the patient takes the TB drugs regularly, on schedule, for the full duration of the treatment. It is important that the patient feels comfortable with you and can ask questions about things that might be difficult to understand. The patient may be very ill and feel ashamed about having TB.

The TB Treatment Supporter's main role is to make sure that the patient takes the TB drugs regularly, on schedule, for the full duration of the treatment.
You will also need to listen and encourage the patient as part of this support.

You will need to provide reassurance that you will be there to help the patient follow the treatment and be completely cured of TB. Listening to and encouraging TB patients and their families is another way of supporting them.

7. WHAT ARE YOUR TASKS AS THE TB TREATMENT SUPPORTER?

Your tasks as the TB Treatment Supporter are very important. You must:

- Agree on a time and place to meet with the TB patient. Do not make the patient wait.
- Give the patient the TB drugs at each appointment according to the schedule. Look at the drugs to be sure they are correct. Watch the patient swallow all the drugs.
- Record on the TB Treatment Card each time the

As the TB Treatment Supporter, you provide ongoing support to the TB patient by:

- **watching the patient take the right TB drugs**
- **marking the TB Treatment Card after the drugs are taken**
- **encouraging the patient to continue coming for TB treatment**
- **making sure there is always a supply of drugs for the patient**
- **referring the patient to the health facility if there are problems**

patient takes the drugs. (The TB Treatment Card is explained in the next section of this booklet.)

- **making sure the patient goes to the health facility when a follow-up sputum exam is due.**

- Be aware of possible side-effects. Encourage the patient to eat food with the drugs if needed to reduce nausea. If side-effects continue, refer the patient to the health facility.

- Encourage the patient to continue coming for TB treatment.

- Respond quickly if the patient misses a scheduled treatment. When a dose is missed for more than 24 hours, visit the patient's home. Find out about the problem that caused the interruption. Give the treatment. If you cannot find the patient or persuade the patient to continue the treatment, contact the health centre for help without delay.

- Go to the health facility to collect a fresh supply of TB drugs each month. Show the patient's TB Treatment Card. Review how the patient is doing and discuss any problems.

- If you or the patient will be away for a few days, make suitable arrangements. Give the

patient enough TB drugs for a maximum of one week or refer the patient to the health facility to decide what is to be done. Someone else may be asked to help during this time.

- Be sure the patient goes to the health facility when a follow-up sputum exam is due.

8. HOW DO YOU USE THE TB TREATMENT CARD?

Mark the TB Treatment Card each time the patient takes the TB drugs.

To kill the TB germs, the patient must take the TB drugs according to the schedule. You are there to provide support and to help make sure the patient takes the drugs correctly. The TB Treatment Card will help you to ensure that you give the patient the right TB drugs at the correct time. It is important for you to **watch** the patient take the TB drugs as scheduled and then **mark** it on the TB Treatment Card.

You will take the TB Treatment Card to the health facility before all of the TB drugs are finished. The health facility staff will look at the TB Treatment Card to see whether the patient has been taking the TB drugs on schedule and will give you the patient's next supply of drugs.

Mark √ on the correct day on the TB Treatment Card each time the patient takes the TB drugs.

Month \ Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
June	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	✓	-	✓	✓	✓														
July																															
August																															

9. HOW DO YOU GIVE THE TB DRUGS?

The staff at the health facility will write on your patient's TB Treatment Card how many of each TB drug the patient should take at each appointment. When the patient comes to you:

- Have the patient's TB Treatment Card ready.
- Pour a glass of water for your patient (a patient who gets nausea can take the TB drugs with food or gruel).
- Take out all the TB drugs that the patient should have today.

- Put the tablets into the patient's hand and then watch the patient swallow them one at a time. If it is difficult to swallow them one after the other, let the patient have a short rest. The TB drugs must be taken together to make sure they work properly.

You must watch the patient swallow all the TB drugs each time.

- Record the treatment on the TB Treatment Card.

10. WHAT ARE THE POSSIBLE SIDEEFFECTS/BAD REACTIONS TO TB DRUGS?

Tell the patient that the TB drugs sometimes cause reactions or side-effects. The patient should tell you if any of these occur. Some reactions are not dangerous and all you need to do is reassure the patient. Other reactions may be dangerous and mean that you must stop the treatment and send the patient immediately to a health facility.

The TB drugs may have sideeffects. The patient should tell you when there are any so you know what to do.

Reaction	Your Response
Not dangerous:	**Continue treatment:**
• Nausea, no desire to eat, stomach-ache, gas	• Reassure the patient and give drugs with food or gruel
• Orange/red urine	• Reassure the patient
• Pain in the joints	• Refer the patient to the health centre
• Burning sensation in the feet	• Refer the patient to the health centre
Dangerous:	
• Skin rash and itching • Skin and/or eyes turn yellow • Vomiting repeatedly • Deafness • Dizziness • Eyesight problems	**STOP treatment and send the patient immediately to a health facility**

11. YOU CAN MAKE A REAL DIFFERENCE.

Making sure that the TB drugs are taken correctly will help to cure the TB patient. By listening to and encouraging the patient you help to strengthen the patient's will to complete the whole TB treatment.

The TB Treatment Supporter helps the patient get well and prevents TB from spreading to the family and community.

When the patient takes the TB drugs correctly it will also help prevent TB from spreading to other family members and to the community.

KEY MESSAGES

1. TB is a disease caused by germs. It spreads most easily when it is in a person's lungs.

2. People with TB have many different symptoms. The major symptom of TB in the lungs is coughing for more than 2 to 3 weeks. It is best to go to a health facility for a check-up.

3. TB spreads to other people when someone with TB coughs or sneezes.

4. It is important for the TB patient to take all the TB drugs regularly, on schedule, for the full duration of the treatment otherwise the disease may become incurable.

5. Prevent TB by:

   - taking treatment and being cured of TB
   - covering the mouth and nose when coughing or sneezing.

6. The TB Treatment Supporter's main role is to make sure that the patient takes the TB drugs regularly, on schedule, for the full duration of the treatment. You will also need to listen and encourage the patient as part of this support.

7. As the TB Treatment Supporter you provide ongoing support to the patient by:

   - watching the patient take the right TB drugs
   - marking the TB Treatment Card after the drugs are taken
   - encouraging the patient to continue coming for TB treatment
   - making sure there is always a supply of drugs for the patient

- referring the patient to the health facility if there are problems
- making sure the patient goes to the health facility when a follow-up sputum exam is due.

8. Mark the TB Treatment Card each time the patient takes the TB drugs.

9. You must watch the patient swallow all the TB drugs each time.

10. The TB drugs may have side-effects. The patient should tell you when there are any so you know what to do.

11. The TB Treatment Supporter helps the patient get well and prevents TB from spreading to the family and community.

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WORLD HEALTH ORGANIZATION

20, avenue Appia, CH 1211 Geneva 27
SWITZERLAND

Tel. +41 22 791 2111
Fax +41 22 791 4268

For further information about tuberculosis or other communicable diseases, please contact

Information Resource Centre
Communicable Diseases
World Health Organization
CH 1211 Geneva 27, Switzerland
cdsdoc@who.int
tel. +41 22 791 3504
Fax +41 22 791 4285

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http://www.who.int/gtb