

# Integrating tuberculosis and HIV care in the primary care setting in South Africa

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## Summary

**BACKGROUND** In many countries including South Africa, the increasing human immunodeficiency virus (HIV) and tuberculosis (TB) epidemics have impacted significantly on already weakened public health services. This paper reviews the scope, process and performance of the HIV and TB services in a primary care setting where antiretroviral therapy is provided, in Khayelitsha, South Africa, in order to assess whether there is a need for some form of integration.

**METHODS** The scope and process of both services were assessed through observations of the service and individual and group interviews with key persons. The performance was assessed by examining the 2001–2002 reports from the health information system and clinical data.

**RESULTS** The TB service is programme oriented to the attainment of an 85% cure rate amongst smear-positive patients while the HIV service has a more holistic approach to the patient with HIV. The TB service is part of a well-established programme that is highly standardized. The HIV service is in the pilot phase. There is a heavy load at both services and there is large degree of cross-referral between the two services. There are lessons that can be learnt from each service. There is an overlap of activities, duplication of services and under-utilization of staff. There are missed opportunities for TB and HIV prevention, diagnosis and management.

**CONCLUSIONS** The study suggests that there may be benefits to integrating HIV and TB services. Constraints to this process are discussed.

**keywords** HIV, tuberculosis, integration, health policy, disease control, South Africa

## Introduction

In many parts of sub-Saharan Africa, tuberculosis (TB) has been endemic for many decades and transmission has been enhanced by overcrowding and poor living conditions. The advent of the human immunodeficiency virus (HIV) epidemic has increased the burden of TB significantly, as untreated HIV infection leads to progressive immune deficiency and increased susceptibility to infections such as TB. In southern Africa, TB is the leading cause of mortality in HIV-infected persons and HIV is driving the TB epidemic.

Human immunodeficiency virus is the strongest factor capable of promoting progression of *Mycobacterium tuberculosis* (MTB) infection to active tuberculosis (Rieder *et al.* 1989) both in people with recently acquired and latent MTB infections (Maher *et al.* 2002). The life-time risk for active TB in an HIV-negative person is 5–10%, while the annual risk in HIV-infected persons is 5–15% (Von Reyn 1999).

Research shows that even in areas where there is a good TB control programme, when the sero-prevalence of HIV is >20%, the annual percentage increase in TB will be high at over 10% (Cantwell and Binkin 1996). However, TB accelerates HIV disease progression and is associated with decreased survival. TB specific mortality is fourfold higher among HIV-infected patients than amongst the uninfected (17.8 and 4.4 deaths per 100 per year for HIV-infected and uninfected patients, respectively) (Connolly *et al.* 1999). In addition, the TB epidemic in persons infected with HIV increases the infectious pool and the risk of TB transmission in the community, whether or not HIV-infected (Maher *et al.* 2002).

Clinical interventions have demonstrated that the burden of TB can be reduced in persons infected with HIV (Anderson & Maher 2001). The World Health Organization (WHO) has formulated guidelines for collaborating TB and HIV services or activities (WHO 2003).

One such initiative, ProTest, was started in 1999 and facilitates HIV/AIDS/STI/TB care. It uses Voluntary Counselling and Testing (VCT) as an entry point to HIV

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care in persons infected with TB. It also aims to improve TB prevention and management. It should strengthen HIV management by providing cotrimoxazole prophylaxis and treatment for opportunistic infections (Godfrey-Faussett *et al.* 2002). Recently it was suggested, following on lessons learnt with ProTest in Zambia, that ProTest services could be extended to provide antiretroviral therapy (ART) (Ayles and Ginwala 2003).

Mahendradhata (personal communication) has reviewed interventions to promote collaboration between HIV and TB services and they conclude that practical ways to deliver these interventions are not clear nor the benefits and constraints involved.

In many countries, including South Africa, the increasing HIV and TB epidemics have impacted significantly on already weakened public health services. As new models for HIV care are being developed, and ART is provided, every effort should be made to determine the optimal model for TB and HIV care.

In 2000, a pilot project was launched in Khayelitsha, South Africa to provide a comprehensive continuum of care for HIV-infected persons, including ART. However it was soon realised that a comprehensive TB/HIV service may be more advantageous due to the large numbers of co-infected patients. The purpose of this paper is to present the initial findings from a review of the HIV and TB services in this primary care setting where ART is provided, in order to assess whether they should be integrated.

## Material and methods

### Study site

Khayelitsha is a poor township in the metropolitan area of Cape Town with 500 000 inhabitants. Approximately 30% of the population live in informal housing while over 45% are unemployed. Most residents rely on public primary health care services. The services are limited by a lack of staff and resources. Three primary care centres or Community Health Centres (CHCs) provide curative care including HIV care, and 10 other services provide TB, sexually transmitted infections (STI) and Child Health care. Two of the TB services are at the same site as the CHC. At both the curative and TB services, the patient load is usually high.

The annual sero-prevalence study at ante-natal services conducted in 2001 showed that 25% of pregnant mothers were HIV-infected. Khayelitsha had the highest annual TB case detection rate in the Western Cape Province at 1031 per 100 000 population in 2001.

In January 1999, the Health Department of the Provincial Administration of the Western Cape (PAWC) introduced a programme for the Prevention of Mother To Child

Transmission at the two midwife-run Obstetric Units. HIV prevalence amongst pregnant women increased from 15% in 1999 to 21% in 2001 and 25% in 2002. In April 2000, PAWC and Médecins Sans Frontières (MSF) opened services for patients with HIV-related problems within the three CHCs.

## Methods

The scope and process of the TB and HIV services were assessed through observations of the service and individual and group interviews with key persons in both the HIV and TB services, carried out in January 2003 by a clinician/researcher.

The performance of the services was assessed by examining the 2001–2002 reports from the health information system related to TB and HIV and the clinical data of the patients registered in both services from January 2000 to December 2002. At the TB service, rates of TB and HIV co-infection and clinical outcomes are recorded while the HIV services prospectively monitor outcomes including adherence to therapy, survival and the incidence of opportunistic infections such as TB.

## Results

### Scope of the services

In January 2003 in Khayelitsha TB is diagnosed and managed strictly according to World Health Organization and national TB guidelines. The services are well established and organised and concentrate on the diagnosis of pulmonary TB through direct sputum microscopy, Directly Observed Therapy Short Course (DOTS) and the attainment of a cure rate of 85% in sputum smear positive cases. TB staff are not confident in identifying extra-pulmonary TB and TB in patients with negative smears.

VCT is offered to patients with TB. Although most patients who are identified as HIV-infected are referred to the HIV service, many do not attend. Cotrimoxazole is often not provided at TB services.

In Khayelitsha the HIV pilot projects provide counselling, support, prophylaxis, treatment, screening and when necessary referral for conditions related to HIV, for patients in WHO stage III and IV (WHO Classification). Patients with bacteriological confirmation of TB are referred to the TB service. Where the diagnosis is not confirmed by smear the TB service is very reluctant to start TB treatment. Cultures are only done for re-treatment patients.

Patients can access the HIV service directly, but most are referred from other services where VCT services operate. Patients in stage I and II should be seen at the general

**Table 1** Comparison of features of TB and HIV services in primary care setting, prior to 2003 in Khayelitsha

	TB service	HIV service
Scope	<p>Emphasis on finding and curing sputum smear positive pulmonary TB.</p> <p>No emphasis on identifying extra-pulmonary TB or smear negative TB.</p> <p>VCT is offered (VCT) and, if positive, referred to HIV clinic. Cotrimoxazole prophylaxis rarely provided.</p>	<p>Holistic approach to patient with HIV – TB part of realm of opportunistic infections seen.</p> <p>Attempt to identify extra-pulmonary and smear negative TB.</p> <p>More comprehensive care: Cotrimoxazole prophylaxis, treatment of opportunistic infections and antiretroviral therapy given for those in need.</p>
Process	<p>Programmatic towards TB only.</p> <p>Well established national programme (DOTS).</p> <p>Highly standardised.</p> <p>Supervise treatment.</p> <p>Qualified staff tend to do administrative and support work.</p>	<p>Patient-centred and attempt to identify all opportunistic infections.</p> <p>Lack of models, pilot project stage.</p> <p>Standardised.</p> <p>Support treatment.</p> <p>Counsellors and volunteers do most administrative and support work.</p>
Performance	<p>&gt;2000 patients on treatment.</p> <p>VCT accepted by 26% of whom 43% are HIV-infected.</p> <p>Cure rate 67%.</p>	<p>&gt;4000 patients registered.</p> <p>13% of patients referred from TB.</p> <p>36% of patients with CD4 cell counts below 200 cells/<math>\mu</math>l develop TB disease in the following year.</p> <p>93% undetectable HIV RNA at 6 months on ART.</p>

curative services. ART has been offered since May 2001. The features of each of the services are presented in Table 1.

### Process of the services

The TB service concentrates on its programmatic target of achieving high cure rates in pulmonary smear positive patients through the DOTS approach. Procedures are highly standardised. Qualified nurses tend to conduct much of the administrative work such as completion of the register, checking for defaulters, pill checking and counting.

The HIV services have a more patient-centred approach with TB seen as part of the realm of opportunistic infections. Procedures are standardised. However an attempt is made to identify extra-pulmonary TB and TB in persons with negative sputum smears. HIV caregivers attempt to support patients and an individual and group support system is in place. Antiretroviral drugs are given on a monthly basis. Qualified nurses mostly do clinical work and counsellors promote adherence and do administrative work.

### Performance of the services

The overall TB detection rate in Khayelitsha is 1031/100 000 in 2001. At any one moment a minimum of

2000 patients are on TB therapy. 23% of patients with TB have extra-pulmonary TB.

The TB service shows a cure rate of 67% for new smear positive patients in 2001, although 76% of patients completed treatment. The cure rate for re-treatment cases for the same period is 53% and 72% completed treatment. The increasing burden of TB is limiting the ability of services to perform daily directly observed treatment (both in the community and at the clinic) and a small proportion of patients are not supervised and are given treatment for one or two weeks at a time.

The HIV status of 26% of TB patients is known and of these 43% are HIV-infected. The uptake of VCT is better at two and six months on treatment than at diagnosis.

During the period under observation over 4000 HIV-infected patients received care at the HIV services. At the HIV services 13% of all patients were referred from the Khayelitsha TB services during the period under observation.

By the end of 2002 there were 350 patients on ART and 23% of these patients were referred from TB services. TB patients have lower CD4 counts and are in more urgent need of antiretroviral therapy.

TB is the commonest opportunistic infection at the HIV service with pulmonary TB accounting for 21% and

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extra-pulmonary TB for 4% of all opportunistic infections. 36% of patients with CD4 cell counts below 200 cells/ $\mu$ l develop TB disease in the following year. Even though there is a 66% reduction in TB incidence in patients on antiretroviral therapy, 11% of these patients acquire TB each year. Less than 5% of HIV-infected patients receive Isoniazid prophylaxis for TB prevention.

93% and 84% of patients on ART have an undetectable HIV RNA level after 6 and 12 months of therapy respectively. The cumulative mortality at one year is 13%.

A review of a consecutive sample of 109 HIV-positive patients with TB showed that 49% of them had negative direct microscopy sputum smears but the culture of their sputum was positive for MTB.

### Discussion

The increasing burden of HIV and TB will place constraints on the ability of public health services to respond in Khayelitsha. The load at both services is high. These results show that although there is a strong overlap of activities and relationship between TB and HIV services, there is duplication of services and under-utilisation of staff.

Apart from the referral of patients between TB and HIV services, they function independently of each other. Separate patient folders are kept in each service, without exchange between caregivers. The clinicians in the different services are unaware of other treatments. Dually infected patients are seen at two services and by different health staff, at different times and places. There are missed opportunities for Cotrimoxazole prophylaxis.

There are lessons that can be learnt from each service. The pilot HIV service could learn from the more established, organised and standardised TB service. Although there are advantages to a very standardised and directed approach to TB control, the rate of extra-pulmonary TB and smear negative pulmonary TB is high and indicates the need to expand the service to actively identify these conditions in HIV infected persons. The current paradigm of the TB programmes to focus on the detection and cure of new smear positive pulmonary TB is challenged by HIV. Yet many of the TB staff do not have the confidence to identify extra-pulmonary or smear negative TB. The development of new guidelines together with training may be necessary.

The performance levels, especially relating to TB are inadequate. The high rate of adherence to ART, as indicated by the high proportion with an undetectable HIV RNA level, may suggest that there are lessons for the TB services in supporting patients on chronic treatment and promoting adherence.

The rate of VCT uptake at TB services is very low and more emphasis should be placed on identifying HIV-infected persons when patients attend the consultation after 2 and 6 months of treatment.

This study suggests that there may be benefits to integrating HIV and TB services. However there may be a number of constraints to this process. An often quoted disadvantage of the integration of TB and HIV services is the potential for the nosocomial spread of TB in areas where patients with active TB (awaiting the confirmation of diagnosis) and highly susceptible HIV-infected patients interact such as in waiting rooms. Although the high prevalence of TB and studies on TB transmission in endemic areas such as Khayelitsha suggest that exposure to TB infection is ubiquitous, every attempt should be made to separate patients coughing up sputum from HIV-infected patients.

There may be resistance from policy makers who do not recognise the benefits. There may also be resistance from staff who see any integration as extra work. This study shows that because of duplication this should not be so. By integrating TB and HIV care, the available human and financial resources can be optimally used. Efficiency gains can also be anticipated by the use of a common information system and a single set of records. A single venue and a comprehensive consultation should result in less waiting time for patients. In addition there is usually more donor support for HIV programmes and this should benefit the TB programme.

For these reasons a pilot project has been initiated to examine the feasibility of combining HIV and TB services in Khayelitsha. This is being done in a stepped-wise process, first using each others records, then developing standardised guidelines and training, followed by the integration of clinical records and management.

### Conclusion

Some form of integration of HIV and TB services is required in order to respond to the urgent needs of these two epidemics. An integrated HIV/TB service may have many benefits for the programmes, services and patients. These benefits and constraints will be monitored as the pilot project proceeds.

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