

## High uptake of HIV testing for tuberculosis patients in an integrated primary health care HIV/TB programme in rural KwaZulu-Natal

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Tuberculosis (TB) is the leading cause of morbidity and mortality in the HIV-infected African population. The need for improved integration of HIV and TB services was highlighted by the World Health Organization (WHO) several years ago, but implementation of recommendations has been slow.<sup>1,2</sup> HIV testing for TB patients is the gateway for combined HIV and TB treatment, care and prevention yet, in 2007, only 37% of TB patients in the WHO African region were tested for HIV.<sup>3</sup> While some countries reported testing rates above 75%, a testing rate of only 39% was reported in South Africa, the country with the largest burden of HIV/TB co-infection.<sup>3</sup> We describe our efforts to ensure high HIV testing rates in TB patients via an integrated programme at primary health care level in rural KwaZulu-Natal.

### Methods

Hlabisa Hospital is a 300-bed district hospital in northern KwaZulu-Natal. The hospital and its 17 primary health care clinics serve a population of 228 000. In 2008, the TB notification rate was approximately 1 700/100 000 population. Antenatal HIV seroprevalence was 37.7% in 2005.<sup>4</sup> In the peripheral clinics, TB nurses identify TB suspects, send sputum for acid-fast bacilli (AFB) smear testing, and initiate treatment for uncomplicated smear-positive cases. In each clinic, the HIV Treatment and Care Programme team is responsible for HIV testing, CD4 count measurement, and initiation and monitoring of antiretroviral therapy (ART). HIV-infected individuals undergo standardised TB screening prior to initiation of ART.

A TB/HIV integration plan was implemented in March 2008, with four key components:

1. Close physical proximity of the TB and HIV teams in the hospital and local clinics (through facilities shared by HIV and TB programme staff) to facilitate patient flow (Fig. 1).

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Fig. 1. Park homes shared by TB and HIV services in peripheral primary health care clinics. Waiting areas are in the shaded open air to reduce TB transmission risk.

2. Introduction of a central TB clinic on the hospital premises for referral of smear-negative and extrapulmonary TB suspects. The protocol for this clinic included clinical evaluation by the TB nurse, TB culture (as appropriate), chest X-ray, ultrasound, HIV counselling and testing, and assessment by a physician with diagnosis based on clinical and radiological features.
3. A programme of training for TB health care workers in HIV-related topics and for HIV staff in TB-related topics (covering the essentials of clinical presentation, diagnosis, and treatment of HIV and TB).
4. Development of a Microsoft Access database to store basic demographic and clinical data relating to TB and HIV. All data were extracted from the National Tuberculosis Control Programme patient cards. The database was used for monitoring and evaluation, a critical aspect of which was regular feedback to each clinic on HIV testing uptake.

The analysis includes all patient data entered into the database from March 2008 to February 2009 (pilot period with incomplete data March - May 2008). Statistical analyses were performed using SPSS 15.0 (SPSS Inc., Chicago). Ethical approval for retrospective analysis of data was granted by the Hlabisa Hospital ethics committee.

### Results

Included in the analysis were 2 953 patients (53% female) who received treatment in the TB programme between March 2008 and February 2009. Seventy-one per cent (95% confidence interval (CI) 69 - 73%) started regimen 1 (rifampicin (R), isoniazid (H), pyrazinamide (Z), and ethambutol (E) for 2 months followed by 4 months RH; for adult patients with newly diagnosed TB); 13% (95% CI 12 - 14%) were placed on regimen 2 (RHZE + streptomycin (S) for 2 months, RHZE for 1 month, then RHE for 5 months; for adult re-treatment cases);

2% (95% CI 1 - 3%) received multidrug-resistant (MDR) TB treatment; and 15% (95% CI 14 - 16%) were children <8 years old (treated with RHZ for 2 months followed by RH for 4 months). Cases were categorised as follows: pulmonary TB (PTB) for 2 805 patients (95% (95% CI 94 - 96%)), of whom 454 (16% (95% CI 15 - 17%)) were recorded as sputum smear-positive, and 2 351 (84% (95% CI 83 - 85%)) were smear-negative. Extrapulmonary TB (EPTB) was recorded in only 148 patients (5% (95% CI 4 - 6%)).

HIV testing uptake was analysed monthly. After the initial training period, the proportion of patients with known HIV status at all clinics combined was 81% and, from additional training and feedback, this rate had increased to 88% by February 2009. In total, there were 2 596 patients with known HIV status (88% (95% CI 87 - 89%)). Overall HIV prevalence was 76% (1973/2 596 (95% CI 74 - 78%)). HIV prevalence was higher for females than males (81% v. 71%,  $p<0.001$ ). HIV prevalence was also significantly higher among re-treatment than new patients (88% v. 78%,  $p<0.001$ ). CD4 counts were recorded for 1 610 patients (81% of HIV-infected): 83% (95% CI 81 - 85%) had CD4 counts <350 cells/ $\mu$ l, 62% (95% CI 60 - 64%) <200 cells/ $\mu$ l, and 20% (95% CI 18 - 22%) <50 cells/ $\mu$ l.

## Discussion

Our finding that the majority of patients seeking treatment in a public sector TB programme are HIV-infected highlights the close connection between the two epidemics in South Africa. Sustainable solutions for the integration of decentralised TB and HIV services at primary health care level are necessary, not only to deal with the overwhelming burden of co-infected individuals but also to implement HIV and TB prevention interventions. Our experience suggests that high rates of HIV testing and enrolment in HIV care can be achieved by relatively simple measures. Physical proximity of TB and HIV services facilitates patient flow, reduces loss of patients, and improves communication between staff members. Training for nurses and counsellors in the TB and HIV programmes, with performance monitoring and regular feedback, should ensure high rates of HIV testing.

Some sub-Saharan African countries have reported similarly high rates of HIV testing in TB patients<sup>5</sup> but, in South Africa, even in research settings, testing rates have generally been reported to be lower.<sup>6</sup> We have demonstrated that there is no specific barrier to achieving high testing rates, and that relatively simple but sustainable solutions can be implemented within the existing primary health care system in rural South Africa. We have also shown relatively high rates of CD4 testing in co-infected individuals, with the majority eligible for ART under WHO guidelines. Future analyses will be directed at determining ART uptake and long-term retention of co-infected individuals.

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