

**Report on the Integration of TB and HIV
Services in *Ubuntu* clinic (Site B), Khayelitsha**

November 2007

City of Cape Town Health Services

Médecins Sans Frontières

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Acknowledgements

The process of integration of TB and HIV services in *Ubuntu* Clinic started in 2003. Over the last four years integration has posed numerous challenges given the magnitude of both epidemics in Khayelitsha and the high co-infection rate. With limited resources and increasing demand for services, the work in the clinic has required constant revision and adjustment, and this only been possible thanks to the cooperation, goodwill and perseverance of a number of individuals.

All those involved in the integration effort are most indebted to the patients attending *Ubuntu*. Patients continue to “vote with their feet” by keeping *Ubuntu* clinic the biggest and busiest TB/HIV clinic in the Metro Region.

Ubuntu Clinic is run by City of Cape Town and Provincial Government of the Western Cape. Other partners (listed below) contribute to different aspects of the functioning of the clinic. Given the multiple-partnership, overall management of the clinic is only possible with good communication, commitment and compromise.

Partners of *Ubuntu* clinic include: the City of Cape Town Health Services, the Department of Health of the Provincial Government of the Western Cape (PGWC); the Infectious Diseases and Epidemiology Unit of the School of Public Health, University of Cape Town (UCT); the Epidemiology Unit of the Institute of Tropical Medicine of Antwerp (Belgium); the Treatment Action Campaign (TAC); TB Care; Lifeline; and Médecins Sans Frontières (MSF).

Table of Contents

3	
HIV and TB: Southern Africa ravaged by two overlapping epidemics.....	5
The HIV epidemic in Khayelitsha	6
The TB epidemic in Khayelitsha.....	7
Drug resistant TB in Khayelitsha.....	7
Integration of TB and HIV services at <i>Ubuntu</i> clinic.....	8
1) Increasing VCT amongst TB clients as an entry point to HIV care	8
2) Diagnosing TB disease earlier in HIV-infected persons	9
1) Facilitating an integrated approach to the management of co-infected persons.....	10
2) Increased service efficiency through more rational staff deployment and increased competence in the management of co-infected patients	10
3) Improved cure rates for both co-infected and TB patients through a patient- centered approach to adherence.....	12
4) Benefiting from the experience of the TB programme to standardize the monitoring of ARV patients.....	12
Conclusions and challenges	13
Annex 1. Analysis of TB caseload in <i>Ubuntu</i> clinic	15

Integration of HIV and TB Services in *Ubuntu* Clinic

HIV and TB: Southern Africa ravaged by two overlapping epidemics

According to the last Global Tuberculosis Control Report from the World Health Organisation (WHO), southern Africa is the only region in the world where TB incidence is still rising,¹ principally due to the HIV epidemic.

South Africa is ranked fifth in the world in terms of countries worst affected by TB. The Western Cape Province has the highest incidence of TB in the country and one of the highest in the world, with incidence above 900 per 100,000 population per year (Figure 1).

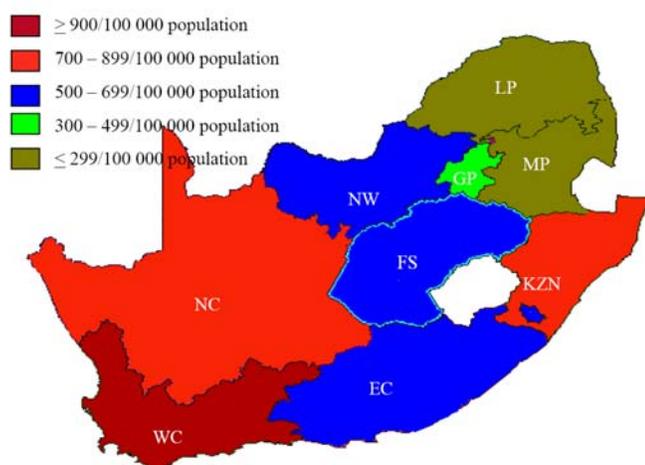


Figure 1. TB incidence (all cases) in South Africa by province (data as of end of 2004). Source: Provincial Government of the Western Cape.

TB diagnosis based on the traditional sputum test has proven to be highly inaccurate in areas of high HIV infection. WHO estimated that globally in 2004 there were 8.9 million new cases of TB (140/100,000 population/year) of which 3.9 million (62/100,000 population/year) were smear positive. This global estimate includes regions where the HIV prevalence is very low, which dilutes the rate for areas of high HIV-prevalence where rates of smear-negative TB can be expected to be much higher. In South Africa, the incidence of TB in 2004 was 718/100,000 population/year of which only 40% (293/100,000 population/year) were smear-positive. TB control programmes based on a sputum test leave large numbers of undiagnosed and untreated TB in areas with high HIV-infection. This jeopardizes the entire TB control effort.

According to WHO, the TB/HIV co-infection rate is above 50% in the southern Africa region, the highest co-infection rate in the world (figure 2). The clinical presentations of TB are affected by patients' immune-competence, which leads to higher rates of extra-pulmonary TB in people at an advanced stage of HIV infection.

¹ Global Tuberculosis Control Report 2007. http://www.who.int/tb/publications/global_report/en

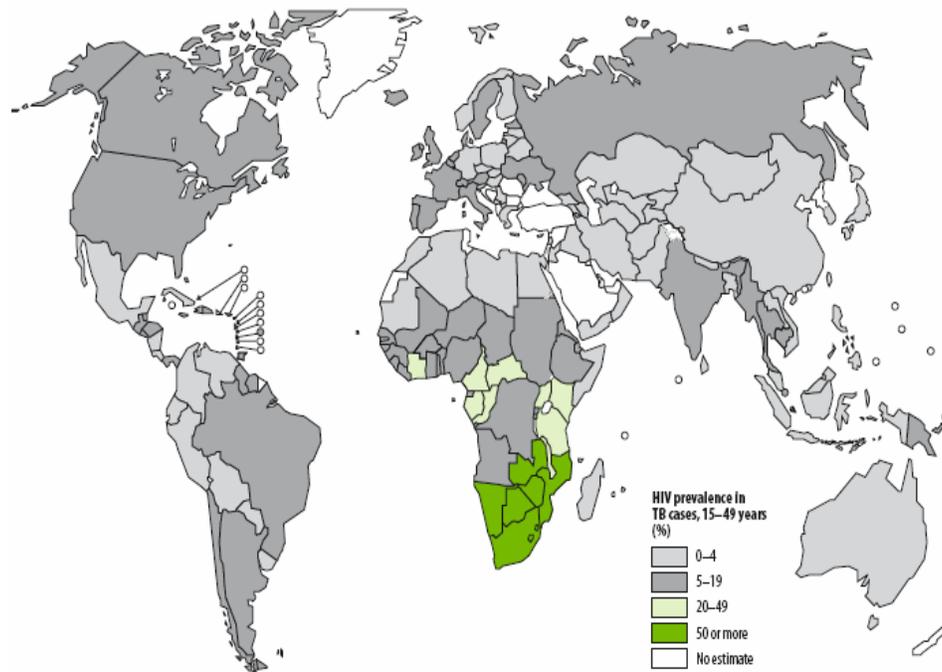


Figure 2. Estimated HIV prevalence in new adult TB-cases by the end of 2005. Source: Global TB Control Report, WHO, 2007.

HIV has also fuelled the emergence of drug resistant (DR) TB in the region. While the magnitude of the problem is not well established since the availability of drug sensitivity testing is scarce, it is estimated that there are 6,000 new cases of multi-drug resistant TB (MDR-TB) cases in South Africa each year.

The HIV epidemic in Khayelitsha

In Khayelitsha township (population c. 500,000) the prevalence of HIV infection measured at antenatal care has increased from 15% in 1999 to over 30% in 2006. Prevention of mother-to-child transmission (PMTCT) strategies are well accepted by the community, with a transmission rate in 2006 of just 4.7% - the lowest in the whole Cape Town metro area. As part of the PMTCT protocol, women with low immunity (CD4<200) are fast tracked onto ARV therapy during pregnancy. Those with higher CD4 counts are given a short course of nevirapine and lamivudine.

In December 2006, 5,930 patients were on ARV therapy of which 4931 adults and 459 children. On average, 200 new patients are started on ARV therapy every month.

The TB epidemic in Khayelitsha

In 2006, 5,884 new cases of TB were diagnosed in Khayelitsha alone. This translates to an incidence of 1,596/100,000 person/year – more than two times higher than the national average and one of the highest in the world. The TB/HIV co-infection rate in 2006 was 67%.

The TB control programme run by the City of Cape Town achieved remarkable outcomes in 2006, with a 76% cure rate and 82% completion rate on new smear positive cases. Despite these achievements, the number of yearly TB cases has steadily risen since 2002 (Figures 3). This appears to have stabilized in 2006, which coincides with a decrease in diagnosis of extra-pulmonary TB (EPTB). The reasons behind this trend are hard to establish. One possible explanation is that the TB control programme, which is still largely based on cure rates diagnosed via sputum tests, may well be failing to identify an increasing number of smear-negative and EPTB cases. This explanation is supported by the dramatic increase in the incidence of smear-negative TB in Khayelitsha – from 27 per 100,000 population/year in 2003 to 200 per 100,000 population/year in 2006² (figure 4). In the same period the incidence in smear-positive TB rose from 400 to 550 per 100,000 population.

Drug resistant TB in Khayelitsha

Increasing numbers of MDR-TB are diagnosed every year in Khayelitsha. In 2004, 9 cases were diagnosed. This rose to 53 cases in 2005, 109 in 2006, and 65 by mid 2007. It is not clear to what extent this increase is a reflection of increasing drug-resistance or better case-detection through systematic screening. Nevertheless, Khayelitsha today has one of the highest reported caseload of MDR-TB in the Cape Peninsula. A third (30%) of the diagnosed MDR-TB cases never had TB before.

Second-line drug sensitivity testing has been available since January 2007. Since then, six XDR cases have been diagnosed.

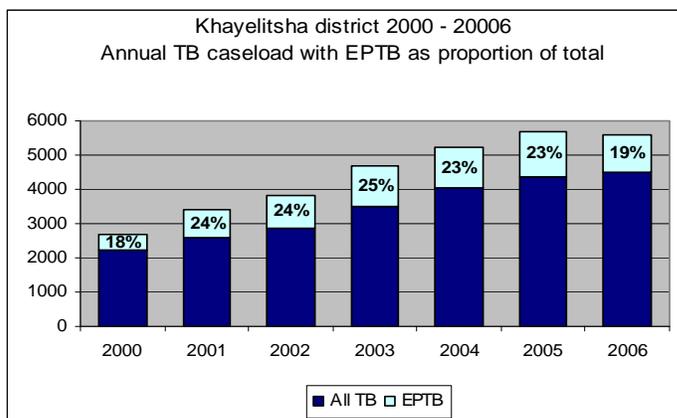


Figure 3. Evolution in TB incidence and proportion of EPTB in Khayelitsha between 2000 and 2006. Source: Ubuntu clinic database, 2007.

² This figure represents only people who were diagnosed by the TB programme so the rate of smear-negative TB is likely to be underestimated.

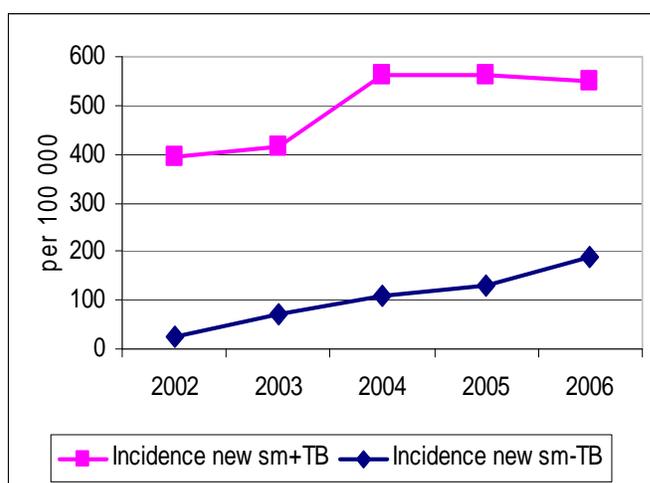


Figure 4. Evolution in the incidence of smear positive (sm+) and smear negative (sm-) TB in Khayelitsha between 2002 and 2006. Source: Ubuntu clinic database, 2007.

Integration of TB and HIV services at *Ubuntu* clinic

The process of integration of TB and HIV services at *Ubuntu* clinic started in 2003 with the overall aim of improving efficiency of service delivery for both conditions. The following specific objectives were defined:

- 1) Increasing VCT amongst TB clients as an entry point to HIV care
- 2) Diagnosing TB disease earlier in HIV-infected persons
- 3) Facilitating an integrated approach to the management of co-infected persons, creating a “one stop” service
- 4) Increasing service efficiency through more rational staff deployment and increased competence in the management of co-infected patients
- 5) Improving cure rates for both co-infected and TB patients through a more patient-centered approach to adherence
- 6) Benefiting from the experience of the TB programme to standardize the approach and the monitoring of ARV patients

The integrated model and initial outcomes were described in an earlier progress report³. This report provides an update to achievements and challenges in the implementation of each of the objectives described above.

1) **Increasing VCT amongst TB clients as an entry point to HIV care**

In the last few years City of Cape Town Health Services prioritized the promotion of HIV counseling and testing for all new TB cases presenting at the Khayelitsha clinics who have not recently been tested. The rationale was to make TB and entry point for HIV care, given the high level of co-infection. This has met with considerable success (Table 1). In 2002, less than 50% of adults diagnosed with TB were offered HIV counselling; by 2006 this figure had risen to 91%, and as of mid-2007 97% of adults diagnosed with TB were offered counselling. The higher access to

³ Report on the Integration of TB and HIV services in Site B, Khayelitsha. MSF and UCT, February 2005. www.msf.org.za.

counselling initially resulted in a drop in the proportion of people accepting to be tested for HIV but by mid-2007 the acceptance rate for testing had reaching similar levels compared to previous years.

In *Ubuntu* clinic about 31% of new TB cases already knew their positive HIV status at the time of TB diagnosis.

Khayelitsha: VCT in TB services			
	Proportion TB patients counselled	Proportion accepting testing	Proportion testing positive
	49%	89%	26%
	62%	84%	45%
	62%	87%	73%
	72%	91%	76%
	91%	94%	67%
	97%	96%	66%

Table 1. Proportion of new TB cases presenting in the Khayelitsha clinics who are counseled and tested for HIV, and positivity rate (2002 - September 2007). Source: City of Cape Town.

2) Diagnosing TB disease earlier in HIV-infected persons

Early diagnoses of TB in areas of high HIV-infection such as Khayelitsha remains a difficult challenge. In 2003, a retrospective analysis of 109 pulmonary TB episodes amongst regular HIV clinic attendees in Khayelitsha showed that only 15% had been diagnosed by sputum test (table 2). Of these 53 (49%) were diagnosed by a culture test. Based on these outcomes, the sensitivity of the smear test for Khayelitsha HIV positive population is 16%, while the sensitivity of the culture test for the same population is 63%.

	Smear (+ve)	Smear (-ve)	Total
Culture (+ve)	53	16	69
Culture (-ve)	38	2	40
	91	18	109

Table 2. Sensitivity analysis based on retrospective folder review for TB diagnosis of HIV patients based on smear and culture tests. Source: MSF, 2003.

A similar folder review done during the first quarter of 2006 showed that among 224 pulmonary TB cases notified in *Ubuntu* clinic, 94 had a positive smear while 103 had a negative result and were identified by culture test. The sensitivity of the smear test increased to 48%.

The poor sensitivity of smear diagnosis was partially explained by the advanced stages of HIV disease amongst people consulting in the HIV clinics in 2003 compared to later years. Progression of HIV disease diversifies the presentation of TB, making diagnosis by microscopy less sensitive. As ARV therapy has become more widely available in Khayelitsha, patients are started onto ARV therapy earlier. The CD4 count at the time of ARV treatment initiation has risen from 72 cells/ μ l in 2003 to 100 cells/ μ l in 2005.

Another explanation for the increased sensitivity of the sputum test between 2003 and 2006 is the drop in the notification rate observed in *Ubuntu* clinic. This may have been due to increased efforts to improve the cure rate, although further follow-up is required.

In the last three years, TB management has achieved remarkable improvements in TB cure rate in *Ubuntu* clinic, increasing from 26% in the third quarter of 2004 to 67% in the second quarter of

2006 (figure 5). Nevertheless, the increase in cure rate went in parallel with a drop in TB caseload since 2004 (figure 6).

Similarly, while the general tendency for Khayelitsha between 2004 and 2006 was to increase the ratio of smear-negative to smear-positive notified pulmonary TB (figure 4), the contrary seems to have been observed in *Ubuntu* clinic. This hints at a potentially harmful consequence of a TB management informed by smear-based cure rate, which may lead to a gradual loss of focus on smear-negative cases, which are not properly diagnosed and followed up. Management measures are being implemented to revert this trend.

1) *Facilitating an integrated approach to the management of co-infected persons*

The high acceptance of a 'one stop' service by patients has been clearly established. Since its inception in 2003, *Ubuntu* clinic has seen an overwhelming increase in the demand of both HIV and TB services, which has required constant re-adjustments of patient flow, referrals to other clinics, and overall management.

This increased demand led to the construction of a larger facility for *Ubuntu* in 2005. The design of the new facility took into account improved infection control measures to reduce the risk of nosocomial infection, as well as a rationalization of patient flow. However, the ever workload is already putting extra strain on the new facility and further renovation is planned for late 2007. A technical assessment of infection control in the clinic took place during the first quarter of 2007, taking into account this rising patient load that includes increasing numbers of drug-resistant TB cases.

Given the large number of specimens processed in *Ubuntu* (around 60 per day), the possibility of re-opening a local sputum laboratory in Site B Community Health Centre is being considered. This would reduce the turnaround time for results, thereby facilitating clinical management.

2) *Increased service efficiency through more rational staff deployment and increased competence in the management of co-infected patients*

Capacitating *Ubuntu* clinical staff to manage both TB and HIV care has been prioritized. All TB nurses in the Khayelitsha sub-district have been trained in HIV staging and management through one-week on-site training. As a positive spin-off of this training, a qualitative increase in the interactions between TB and HIV staff in the clinics has been observed. These interactions happen both informally and through formal weekly clinics to discuss outcomes, resulting in clear benefits for patients and overall programme management.

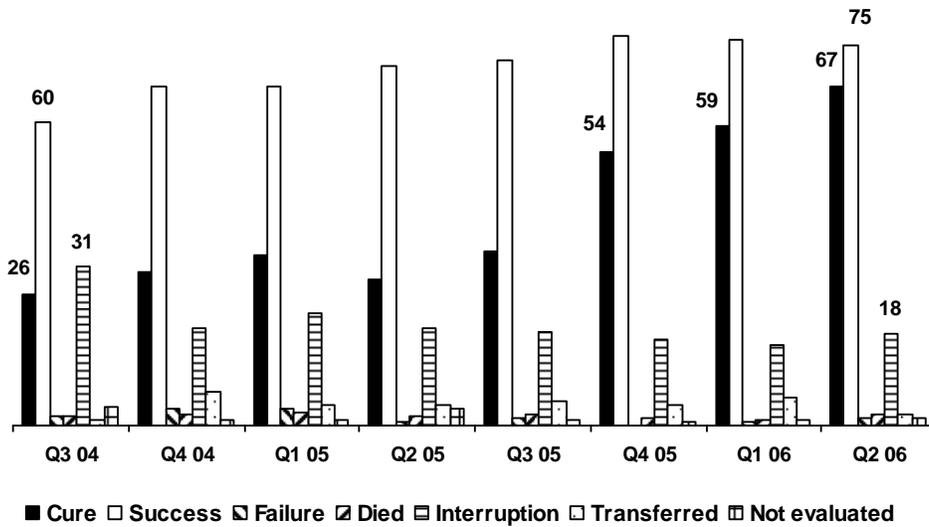


Figure 5. Evolution of basic quarterly indicators of TB in Khayelitsha (cure, success, failure, death, interruption and transfer out) between the third quarter of 2004 and the second quarter of 2006. Source: City of Cape Town.

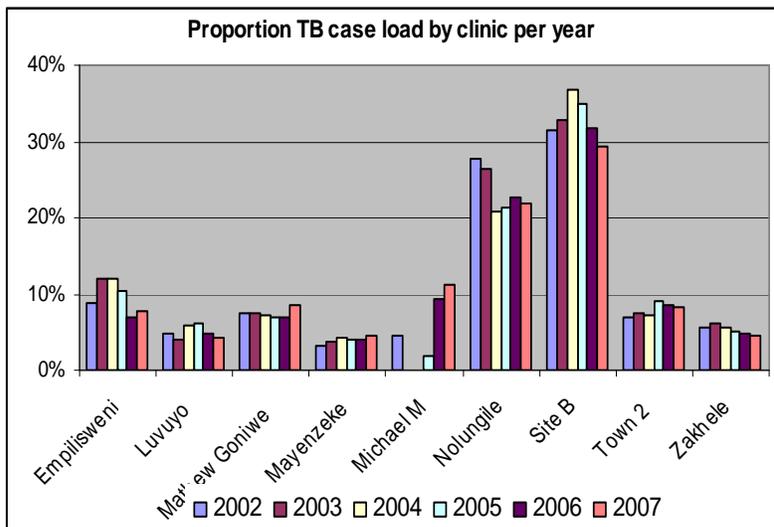


Figure 6. Evolution in the proportion of TB case load per clinic in Khayelitsha between 2002 and September 2007 (Site B = Ubuntu clinic). Source: City of Cape Town.

3) *Improved cure rates for both co-infected and TB patients through a patient-centered approach to adherence*

Several steps have been taken in *Ubuntu* clinic over the years to move the adherence-support model implemented in the TB programme to a more patient-centered approach, building from the lessons learnt in the roll out of ARV treatment. These efforts are recently being framed within an initiative called Enhanced TB Adherence, lead by the City of Cape Town. The initiative is being piloted in *Ubuntu* and some other clinics in Khayelitsha, and aims at increasing treatment literacy in TB and giving greater responsibility to TB patients for their treatment. It moves away from the hierarchical and disempowering adherence-support model of DOTs and towards self-administered therapy.

TB patients in *Ubuntu* are being thoroughly educated about the medications they take, their names, therapeutic value and possible side-effects, supported by easy-to-read materials such as drug identification charts. Patients are also taught about the importance of committing to long treatment, and on the need to undergo sputa control, and are supported by support groups, particularly during treatment initiation. New patients who have not previously defaulted or interrupted treatment and who do not have the options of workplace DOTs are offered the possibility of weekly supplies of drugs once they have understood the principles of their treatment.

This strategy has been well received by staff and above all by patients. A formal evaluation is planned.

Community-support networks still need to be built and maintained, in a similar way as exist for the ARV programme. Given the high level of HIV/TB co-infection, the development of join TB/HIV community support networks is being discussed.

4) *Benefiting from the experience of the TB programme to standardize the monitoring of ARV patients.*

Arguments about the need to standardize TB and HIV management through training of clinical staff and a comprehensive adherence support programme have been covered in the sections above.

An important effort was invested in the last years to unify the health information system. At present, all new TB cases are being introduced in an electronic TB register which is linked to the HIV database. This allows for identification of patients who do not come for their scheduled appointments or to collect their medication. A new electronic database (Ekappa II) will soon be piloted integrating monitoring of both TB and ARV programmes.

Given the increasing workload in *Ubuntu*, additional measures need to be implemented to strengthen administrative support to the clinic (folder and data management, patient flow, etc).

The *Ubuntu* Research Committee (URC) was established in 2007 to review the interest, coherence and practical impact of the many requests to conduct research at the clinic. Any research project to be conducted in *Ubuntu* needs to be approved by this Committee, to ensure that any research carried out is in the best interest of the patients. Local clinicians involved in daily patient care form part of the Committee.⁴

⁴ The Committee does not provide ethical approval for studies; this must be sought from the relevant Ethics Review Boards.

Conclusions and challenges

Four years after initiating the integration of TB and HIV services in *Ubuntu* clinic, the main achievement of the centre is to be a preferred model for both staff and patients. This is clearly illustrated by the overwhelming demand of the service by the patients and the high motivation and cohesiveness of the staff.

Based on the observations from *Ubuntu* and other integrated clinics, TB/HIV integration has been now adopted as official policy for Provincial Government of the Western Cape.

TB patients in Khayelitsha have "voted with their feet" by showing preference for a one-stop integrated service over other options at primary health care level. Because the demand of the service has increased dramatically, management support has been essential to review patient flow and standard operating procedures in the clinic to meet the ever growing demands.

Training of clinical staff at the TB clinic on HIV management has increased the interaction between the TB and the HIV team. Better communications has immediate benefits in patient management. In particular, a dramatic improvement has been observed in promoting counselling and testing for HIV amongst all new TB cases – nearly 100% of acceptance of counselling and testing.

The TB adherence support model has moved towards a patient-centred approach inspired in the model developed for ARV treatment. TB treatment literacy is provided by TB counsellors, educators and treatment assistants as part of the package offered to TB clients.

Nevertheless, current TB indicators - mainly focused on smear-positive outcomes - do not reflect this improvement and need further attention. TB diagnosis based on smear test has proven to be poorly sensitive and unreliable. An increase in TB cure rate based on smear seems to be masking a drop in notification rate in *Ubuntu*. This observation needs to be translated urgently in a management response, since it seems to be leaving many smear-negative patients untreated.

Replication of the model to other sites in Khayelitsha has been essential to release pressure from *Ubuntu*. Two new ARV clinics (Mathew Goniwe and Kuyasa) were started in Khayelitsha during 2006 and these clinics provided integrated HIV/TB care from the outset. The opening of further integrated sites is envisioned for 2008, as well as the integration of TB and HIV care in other existing sites (Nolungile and Michael Mapongwana).

Khayelitsha has one of the highest concentration of MDR-TB cases in the Cape Peninsula. The burden of drug resistance in Khayelitsha has motivated the development of a proposal to pilot the decentralization of intensive phase treatment of drug resistant TB. After exploring the feasibility of integrating TB and HIV, Khayelitsha health services have no option but to explore the integration of comprehensive MDR-TB services as well, using the community based support services developed for the ARV programme. To support this objective, an innovative adherence support model for patients with MDR-TB has been developed, which incorporates home visits for defaulters through outreach team.

It is imperative to develop integrated and context-sensitive models of TB and HIV care to contain and reverse the dramatic evolution of this dual epidemic in the southern Africa region. Integration of TB and HIV services at the primary health care level has proven successful, and must be adapted to respond to the growing burden of drug-resistant TB. This means developing a continuum of care for patients with DR TB who require isolation in small facilities at the community level during the acute phase, follow up at primary health care, patient empowerment to support adherence and home visits for patients who fall out of care. Such an approach would benefit from community-based support measures that exist within decentralized HIV programmes and hopefully reduce stigma and decrease the high defaulter rates currently experienced in DR TB programmes.

Annex 1. Analysis of the TB caseload at *Ubuntu* clinic during the first quarter of 2006.

Cape Town, November 2007