

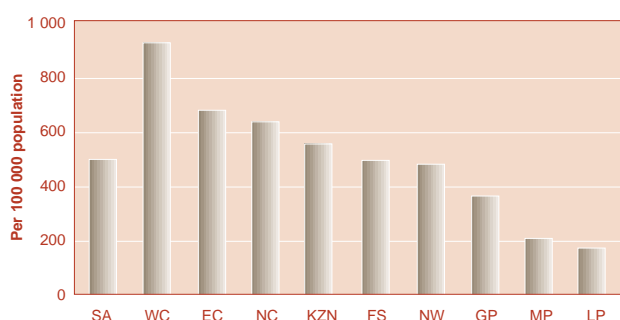
TUBERCULOSIS



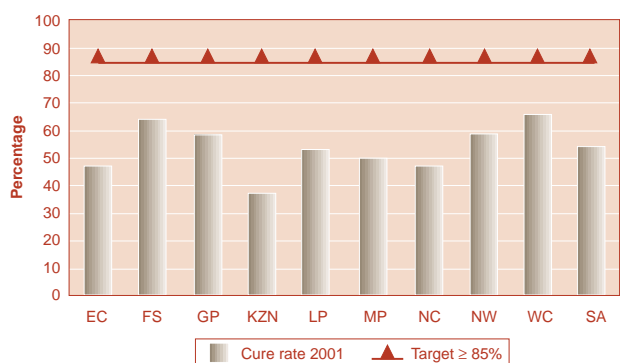
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Health Systems Trust

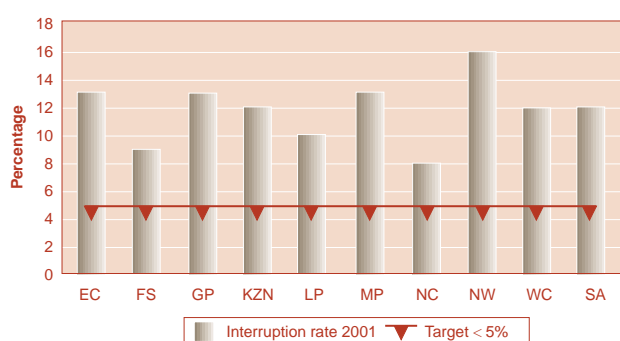
Incidence (all TB), 2002



Cure rate, 2001



Interruption rate, 2001



Key Messages

- ◇ Globally only six countries have more cases of TB than South Africa.
- ◇ HIV infection is the greatest individual risk factor for TB and over half Sm+ patients are HIV+.
- ◇ DOTS coverage has increased to 182 out of 183 sub-districts.
- ◇ Policies, guidelines, indicators and monitoring tools are in place, but are inconsistently applied.
- ◇ Cure rates remain unacceptably low.
- ◇ Management capacity and systems at district and PHC facility level will need to be strengthened if treatment outcomes are to be improved.

Framework for Monitoring and Evaluation

Global:

- ◇ Amsterdam Declaration to Stop TB
- ◇ WHO standard reporting forms
- ◇ WHO DOTS Strategic Framework

South Africa:

- ◇ TB Medium Term Development Plan (MTDP)
- ◇ TB Recording and Reporting system
- ◇ Health Goals, Objectives and Indicators 2001-2005

Key Indicators

Case Finding

- Incidence of TB
- Case detection rate (new Sm+)
- Smear positivity
- Retreatment Ratio

Case holding

- Cure rate (new Sm+)
- Interruption rate (new Sm+)

Programme Management

- DOTS Coverage

Key References and Data Sources

- ◇ National TB Control Programme, NDoH
- ◇ WHO Global Tuberculosis Control reports

Introduction

Tuberculosis (TB) poses an enormous threat to the health of South Africans. In 2002, only six countries were estimated by the World Health Organization to have more cases of TB than South Africa (SA). The estimated incidence of 556 cases per 100 000 population is also one of the highest in the world.

The HIV epidemic in SA fuels the TB epidemic, with both predominantly affecting young people. A recent study showed that 55% of patients with smear or culture positive TB in SA were HIV-positive.¹ This underscores the need for collaboration and integration of HIV and TB services, as well as the key role of HIV prevention in controlling the TB epidemic.

The National TB Directorate has achieved considerable success in developing and implementing the National TB Control Programme (NTCP). DOTS coverage has increased substantially, and 182 of the country's 183 sub-districts now implement the strategy. In line with the Global DOTS Expansion Plan, SA has developed a Medium Term Development Plan (MTDP). The plan provides the template for mobilisation of human and financial resources needed to expand TB control efforts, and has been supplemented by provincial implementation plans.

Clear TB policies and guidelines are in place. Key indicators have been identified and clear targets set. Registers and other key monitoring tools have been developed and implemented. However lack of management capacity, poor management systems, and inadequately trained and motivated staff at a district level have often been cited as the reasons contributing to the failure of the NTCP.^{2,3}

This chapter identifies key frameworks for monitoring and evaluation of TB control efforts and provides an overview of the current situation based on available data. Constraints to effective TB control efforts are identified and illustrated using two case studies. The final section contains recommendations for improving the overall performance of national TB control efforts.

Framework for Monitoring and Evaluation

Four frameworks for monitoring and evaluation of TB control in SA are identified and discussed below. These are:

- ◆ The International Framework for TB control
- ◆ The National Strategic Health Plan - Health Goals, Objectives and Indicators (HGOI)
- ◆ The TB Medium Term Development Plan (MTDP)
- ◆ The TB Recording and Reporting System (based on data collected through TB registers).

International Framework for TB control

SA is a signatory to the Amsterdam Declaration to Stop TB of March 2000,^a which commits the country to accelerated action against TB through:

- ◆ Expanding DOTS to ensure case detection rates of at least 70% of infections (smear positive) TB cases by 2005;
- ◆ Ensuring sufficient and sustainable resources to meet the challenge of stopping TB;
- ◆ Ensuring adequate capacity to absorb and utilise resources effectively;
- ◆ Implementing, monitoring and evaluating a NTCP in line with WHO standards;
- ◆ Improving systems of procurement and distribution of TB drugs in order to ensure quality, access, transparency and timely supply;
- ◆ Incorporating TB performance indicators into overall health sector performance measurement;
- ◆ Promoting the development of national and international partnerships to stop TB with all stakeholders in society, including government departments and organisations, private health sector, industry, non-governmental organisations and the community; and
- ◆ Participating actively in the global partnership to Stop TB.

Global progress in implementing effective TB control efforts is monitored by WHO on an annual basis. WHO collects information on national TB control programmes from 210 countries and territories using a standard data collection form, and compiles an annual Global TB Control Report.⁴

^a Available from <http://www.stoptb.org/conference/Decla.access.html>

Table 1: Selected International Indicators of TB control

Indicator	Definition	Comments
Global rank	Ranking of countries reporting TB data to WHO by estimated number of all TB cases	
Estimated incidence	Estimates of incidence for each country are derived by WHO from several sources of data using various methods	This differs from the incidence calculated by the NTCP which is based on the number of reported cases.
Estimated % of adult (15-49 yrs) TB cases HIV+	Estimated % of adults (15 -49 yrs) with TB who are HIV infected	
Estimated % of new cases which are multidrug resistant (MDR)	Estimated % of new cases which are multidrug resistant i.e. resistant to isoniazid and rifampicin	
DOTS population coverage (%)	Percentage of population falling within administrative areas where the DOTS TB control strategy is used.	Reported DOTS population coverage is defined according to each Ministry of Health's classification of the catchment areas of health facilities, and is an approximate measure of access.
Case detection rate (Sm+, %)	Proportion of new smear positive notifications divided by estimated new smear positive incidence	This is an indicator of TB control programmes' ability to detect and identify smear positive cases. The estimated new smear positive incidence is calculated by WHO using modelling techniques.

Source: Global TB Control Report 2003⁴

National Framework for TB control

National Health Strategy

The Health Goals, Objectives and Indicators⁵ include a number of indicators related to TB, and the co-management of TB and HIV.

The goals related to TB control are to:

- ◆ Provide adequate treatment for HIV/AIDS and TB related infections, and care and support services to communities
- ◆ Reduce the overall morbidity and mortality due to TB through ensuring that 85% of new smear positive (SM+) TB cases are cured on the first attempt and that fewer than 5% of TB patients interrupt their treatment.

Indicators to measure achievement of these goals (and targets) include:

- ◆ Proportion of HIV/AIDS population with access to TB treatment (no target);
- ◆ Cure rate: Percentage of new smear positive TB cases cured at the first attempt (85%);
- ◆ Interruption rate: Proportion of new smear positive cases that interrupt treatment (<5%).

Information regarding the first indicator, which would need to be measured through a national survey, is currently not available. Information on cure and interrupter rates are collected through the national TB recording and reporting system and are discussed below.

The National TB Control Programme

The overall objectives of the NTCP as outlined in the MTDP are:

- ◆ To reduce mortality, morbidity and transmission of the disease;
- ◆ To reduce human suffering and the social and economic burden that families, communities and the country bear as a consequence of the disease;
- ◆ To establish optimal coordination and coordinated action with the HIV/AIDS and STI programme; and
- ◆ To prevent the development of drug resistance.

The short term objectives of the NTCP, which should be achieved by 2005, are:

- ◆ To achieve cure rates of 80 - 85% among sputum-positive TB cases;
- ◆ To detect 70% of the estimated new smear positive TB cases; and
- ◆ To achieve DOTS coverage in all districts.

The key strategies for achieving these objectives are implementation of the WHO revised DOTS Strategic Framework (Box 1) and development and strengthening of partnerships.

Box 1: The DOTS Strategic Framework

- ◇ Sustained political commitment expressed by availing sufficient human and financial resources for achieving the international targets for TB control in the context of the national health system;
- ◇ Good quality case-detection;
- ◇ Standardised short-course chemotherapy to all cases including provision of technically sound and socially supportive direct observation of treatment (DOT);
- ◇ Uninterrupted supply of quality-assured drugs with reliable drug procurement and distribution systems; and
- ◇ Recording and reporting systems enabling outcome assessment of each patient and assessment of the overall programme performance.

Indicators for measuring progress in implementing the MTDP are listed in Table 2.

Table 2: Indicators contained in the MTDP

Indicator	Definition	Source	Current Status	Range/ Targets
Case finding indicators				
Incidence of TB (can also be calculated for PTB and Sm+ TB)	No. of cases of TB (PTB or Sm+ TB)	Recording and reporting system		
Proportion of smear positive pulmonary cases among TB suspects	No. of smear positive pulmonary cases detected divided by the total no. of suspects	Laboratory register	Not currently collected as laboratory registers have not been implemented in all laboratories	5 -10%
Case detection rate new Sm+ pulmonary cases	No. new smear positive pulmonary cases as % of expected no. of incident cases	Recording and reporting system	Calculated by WHO	70% (WHO target)
Proportion pulmonary Sm+ cases out of all pulmonary cases (smear positivity)	No. of new Sm+ pulmonary cases divided by total no. of pulmonary cases	Recording and reporting system	Available	50 - 70%
Retreatment ratio	No. of Sm+ retreatment cases divided by the no. of Sm+ cases (new and retreatment)	Recording and reporting system	Available (calculated from case-finding indicators)	6 - 8%
Proportion of extra-pulmonary TB	No. of extra-pulmonary TB cases divided by total no. of TB cases	Recording and reporting system	Available	
HIV positivity among TB patients	No. of HIV+ TB patients divided by all TB patients	Sentinel report	Available through MDR survey	
Accessibility of laboratory services	No. of laboratories with sputum smear services divided by no. of laboratories	Progress reports	Not currently collected	
Smear result turn around time	No. of days elapsed between receiving sputum specimens from the patient and receiving results	Sputum referral form Laboratory register	Collected and used at district and provincial level. Not available at national level	Less than 2 days

Indicator	Definition	Source	Current Status	Range/Targets
Case holding indicators				
Ratio Sm+ pulmonary patients put on treatment	No. of Sm+ pulmonary patients in TB register divided by no. in laboratory register	TB register Laboratory register	Not available as laboratory registers not used	95 - 100%
Smear conversion rate at 2 (3) months	No. of Sm+ cases that convert from smear positive to smear negative at 2 (new Sm+ patients) and 3 (retreatment patients) months	Recording and reporting system (Smear conversion rate form)	Collected and used at district and provincial level. Not available at national level	≥ 85%
Treatment outcome	Cure, completion, success, failure, death, default and transfer rates for different patient categories			
Cure rate (new Sm+) ^b	Percentage of new Sm+ patients who are smear negative at the end of treatment	Recording and reporting system (TB register)	Available	≥ 85%
Interruption rate (new Sm+) ^B	Percentage of new Sm+ patients who interrupted (defaulted) treatment (patient did not collect drugs for ≥ 2 months at any time after registration)	Recording and reporting system (TB register)	Available	< 5%
Drug resistance	Drug resistance patterns under different retreatment categories (relapse, failure, return after default)	Progress reports	Not collected routinely	
Access and acceptance of VCT	Proportion of TB patients receiving VCT out of all registered patients	Progress reports	Not collected routinely, but will be introduced in 2004/05	
Programme management				
DOT(S) coverage	No. of districts implementing DOTS strategy as a % of all districts	Progress reports	Available	100%
	No. of clinics offering DOT services, as % of all PHC clinics		Not available	100%
	No. of patients receiving community-based DOT as % of all patients		Not available	Area specific
Supervision	Proportion of supervisory visits conducted as proportion of visits programmed	Progress reports	Not available	75%
Reporting	Proportion of correct quarterly reports timely at provincial office		Collected by provinces	100%

^b Cure rate and interruption rate are two key subgroups of the indicator 'Treatment outcome'

Indicator	Definition	Source	Current Status	Range/ Targets
Drug accounting	Proportion of drugs and supplies used in a quarter compared to the estimated quantity for that quarter	Recording and reporting system	Not collected	90 - 110%
Drug stocks	Various stocks of TB drugs at facility, district and provincial levels expressed in months supplies. Stock on hand divided by average quantity used per month.	Quarterly drug stock reports	Not collected	Facility - 3 months District - 3 months Province - 6 months
Sputum smear quality control	Proportion of slides false positive and negative in QA sample	QA quarterly reports	Internal quality control is undertaken, but results are not collated	False negative: 0 - 2%
	Proportion of agreement in sputum smear quality control			False positive: 0 - 5%
Training	Proportion of training sessions conducted as a proportion of sessions programmed	Progress reports	Not collected	> 80%
Drug resistance	Prevalence and trends of drug resistance, MDR-TB in particular	Project report	Available through MDR survey	Initial Resistance: 0 - 1% Acquired Resistance: 2 - 4%

Source: Adapted from NTCP MTDP, available from <http://www.doh.gov.za/tb/docs/mtdp.pdf>

Data and Analysis

Programme Management Indicators

Implementation of DOTS

The number of sub-districts implementing the DOTS strategy has increased consistently. By 2003, 182 of 183 sub-districts were implementing the strategy.

Incidence of TB and case finding indicators

Recent global TB control efforts have been focused on the twenty-two high burden countries, which together account for approximately 80% of the world's TB cases. With an estimated 243 000 cases in 2002, SA occupied seventh position (from ninth in 2001). Only two of the high burden countries are estimated to have incidences of TB higher than the estimated figure for SA.

The number of reported cases of TB has consistently risen since inception of the NTCP in 1996 (Figure 1). This is likely to reflect a real increase in the number of cases due in part to the rising HIV prevalence, as well as improvements in case detection and reporting. A total of 224 420 cases of TB were registered during 2002, an increase of 16% from the previous year. This represents an incidence of 494 cases per 100 000 people.

WHO has consistently reported case detection rates for new smear positive cases for SA of over 85% i.e. well above the international target of 70%. However the figure is probably an overestimate.^c Accurate prevalence figures for the country are currently unavailable, and prevalence surveys will be required if more accurate estimates are to be developed.

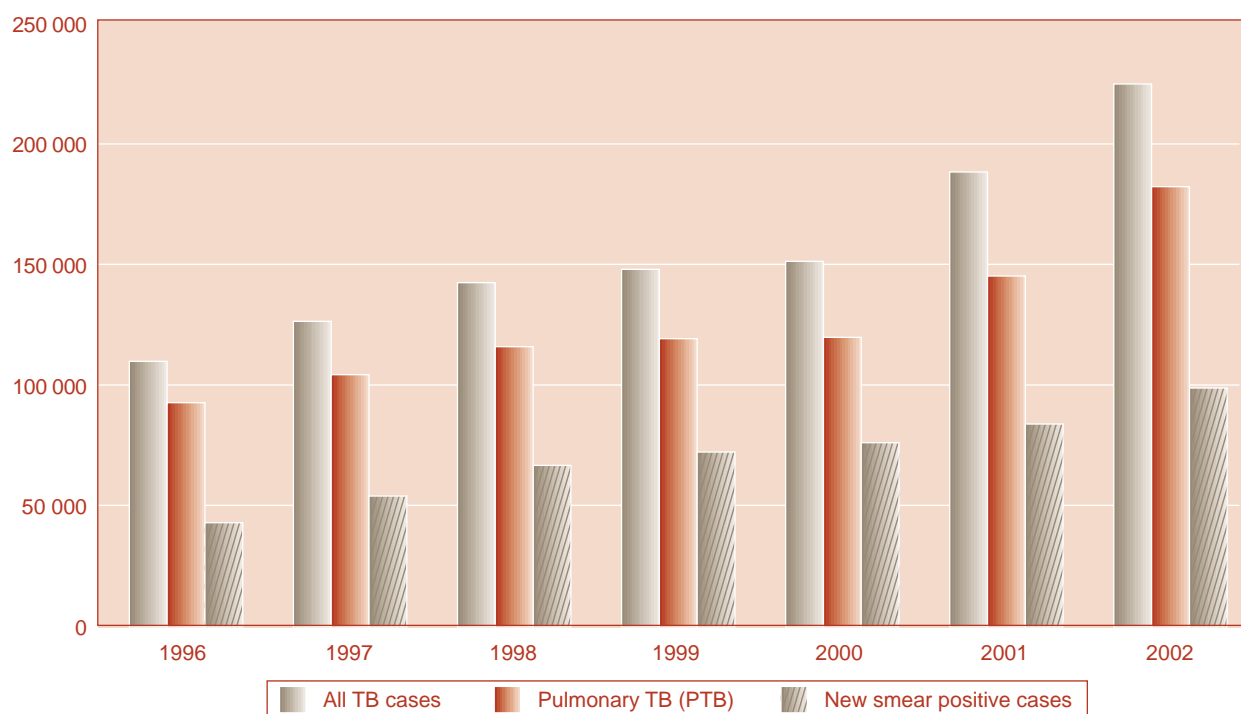
c Dr Lindi Mvusi, NTCP, personal communication.

Table 3: Total estimated cases and incidence for the top ten high burden countries

Rank	Country	Total estimated cases (thousands)	Incidence per 100 000 population
1	India	1 820	178
2	China	1 448	113
3	Indonesia	582	271
4	Bangladesh	328	233
5	Nigeria	275	235
6	Pakistan	247	171
7	South Africa	243	556
8	Philippines	229	297
9	Russian Federation	193	134
10	Ethiopia	188	292

Source: Global TB Report 2003⁴

Figure 1: Number of TB, PTB and Sm+ cases in SA, 1996-2002



Source: NTCP, NDoH^d

d These are the most recent figures supplied by the NTCP, which are in some instances slightly different to figures that were previously supplied by the NTCP and quoted in previous South African Health Reviews.

A Multi-drug Resistant (MDR) TB survey undertaken in eight provinces between 2000 and 2002 revealed that 1.7% of new cases had MDR TB.^e Although this level is not significantly higher than the global median of 1.1%, the high burden of TB in SA means that SA has more MDR TB cases than any other country for which MDR prevalence data is available (with the exception of Kazakhstan).¹ It should also be noted that the Northern Cape, which may have an extremely high incidence of MDR TB, was not included in the study.⁶

Baseline data were only available for Mpumalanga and the Western Cape. MDR levels in Mpumalanga increased from 1.5% of all new smear positive cases in 1997 to 2.1% of such cases in 2001.¹ In contrast, MDR levels in the Western Cape remained stable for the period 1993 - 2002. The Third Global Report on Anti-Tuberculosis Drug Resistance confirms the link between poor programme performance, or insufficient coverage of a good programme, and drug resistance. Thus, although treatment of MDR TB remains an important component of overall TB control efforts in SA, ensuring adequate treatment of all TB cases needs to retain centre stage.

The MDR study also provided information regarding HIV prevalence amongst a random sample of TB patients; 55.3% of cases were found to be HIV-positive.¹ This is slightly lower than the WHO estimate of 60%; nevertheless it is extremely high and underscores the need for linking TB control and HIV prevention and care initiatives.

A provincial breakdown of NTCP data on case finding is presented in Table 4. KwaZulu-Natal, Eastern Cape and Western Cape have the highest number of cases of TB. These provinces, together with the Northern Cape, also have incidences of TB which are higher than the national average.

The proportion of pulmonary new smear positive cases out of all pulmonary cases is shown over time in Table 5 and by province in Table 6. This indicator measures the extent to which the diagnosis and treatment of new smear positive patients is prioritised as advocated by the DOTS strategy. Although sputum microscopy results should be available on all patients with suspected PTB (i.e. bacteriological coverage should be 100%), a certain proportion of patients with PTB will be smear negative.

Table 4: Case finding indicators for 2002 (and 2001, SA only)

	All TB	Incidence all TB per 100 000	PTB	Pulmonary TB						Extrapulmonary TB		
				New Sm+			Re-treat Sm+		New Sm- PTB			
				No. of cases	Incidence New Sm+ per 100 000	% of all PTB	No. of cases	% of all PTB	No. of cases	% of all PTB		
No. of cases	per 100 000	% of all PTB	No. of cases	% of all PTB	No. of cases	% of all PTB	No. of cases	% of all TB				
EC	48 130	672.3	41 554	16 266	227.2	39	5 723	14	1 461	4	5 536	12
FS	14 221	494.0	11 630	7 841	272.4	67	2 202	19	1 258	11	2 260	16
GP	30 515	373.5	23 346	15 315	187.4	66	2 586	11	1 263	5	7 166	23
KZN	52 016	558.8	43 055	18 737	201.3	44	2 897	7	4 570	11	8 483	16
LP	10 098	172.4	7 265	5 369	91.7	74	340	5	651	9	1 346	13
MP	6 536	205.5	5 893	4 102	129.0	70	534	9	338	6	642	10
NC	5 642	633.3	4 918	3 024	339.4	61	947	19	192	4	380	7
NW	17 612	477.8	15 082	9 593	260.3	64	1 661	11	546	4	2 530	14
WC	39 650	917.4	29 840	18 553	429.3	62	8 201	27	2 611	9	4 427	11
SA 2002	224 420	493.7	182 583	98 800	217.4	54	25 091	14	12 890	7	32 770	15
SA 2001	188 695	423.5	144 910	83 808	188.1	58	20 686	14	12 503	9	23 623	13

Source: NTCP, NDoH

Note: Incidence calculated using StatsSA mid-year estimates for 2001 and 2002 (without AIDS)

e Dr Lindi Mvusi, NTCP, personal communication.

A country such as SA, which is still struggling to ensure acceptable cure rates in the face of a rising incidence of PTB, should prioritise the treatment of smear positive cases. The picture is however complicated by the fact that the incidence of smear negative PTB is higher in HIV infected people – thus one might expect the percentage of PTB patients who are smear positive to fall as the HIV/AIDS epidemic progresses.

Table 5: Key case finding indicators, 1996-2002

	Smear positivity (%)	Proportion Extra-pulmonary TB (%)
1996	45	6
1997	52	7
1998	57	8
1999	61	10
2000	63	11
2001	58	13
2002	54	15

Source: NTCP, NDoH

All provinces with the exception of the Eastern Cape and KwaZulu-Natal reached the current target of 50-70% set by the NTCP. The extremely low rates found in these provinces are likely to reflect ongoing reliance on chest X-rays rather than smear microscopy in the diagnosis of pulmonary TB, whilst the fall-off in the national figure since 2000 is likely to reflect both failure to rely on smear microscopy and the effect of the maturing HIV epidemic.

Table 6: Key case finding indicators by province, 2002

Province	Smear positivity (%)	Retreatment Ratios (%)
Eastern Cape	39	26
Free State	67	22
Gauteng	66	14
KwaZulu-Natal	44	13
Limpopo	74	6
Mpumalanga	70	12
Northern Cape	61	24
North West	64	15
Western Cape	62	31
South Africa	54	20

Source: NTCP, NDoH

HIV infected individuals are also more likely to suffer from extra-pulmonary TB. Thus the rising proportion of extra-pulmonary TB (Table 5) also reflects the effects of the HIV epidemic on patterns of TB infection and disease.

The retreatment ratio is identified in the MTDP as a key case finding indicator. Ratios for the provinces are shown in Table 6. Figures for all provinces (except Limpopo) are well above the national target of 6-8%. However, high interruption rates contribute to high retreatment ratios. Ensuring that new cases are cured on the first attempt is likely to be the key to reducing these ratios.

Results of other case finding indicators as defined in the NTCP MTDP are not currently available.

Case holding indicators

Treatment outcomes provide an accurate picture of the ability of health services to ensure that patients complete their treatment, and of the overall performance of TB control strategies. Provincial figures for new smear positive patients registered during 2001 are shown in Table 7.

In order to be classified as 'cured', patients must be shown to be smear negative at the end of treatment. 'Successful' treatment rates include patients who completed their course of treatment, but whose sputa were not examined. Cure rates for new smear positive patients in all provinces remain well below the WHO (and NTCP) target of 85%. Only 54% of patients were documented to have successfully completed their treatment. The Western Cape achieved the highest cure rate, whilst KwaZulu-Natal performed worst.

Patterns have remained constant since the inception of the NTCP (see table 8) with relatively high death rates (often due to HIV co-infection), low failure rates and high transfer rates. It should be noted that patients who were transferred during treatment have only been included in the denominator since 2000, hence the decline in cure and successful treatment outcomes. Ensuring that patients complete treatment is vital for the welfare of the patients concerned, helps to reduce transmission and prevent the development of drug resistance, and is essential if SA is to approach the treatment success target of 85%. Better liaison between hospitals and clinics in the same district would also reduce the number of patients who are (incorrectly) categorised as having 'transferred' and would result in improved cure rates.

Table 7: Treatment Outcomes for new smear positive patients per province (%), 2001

	Cured	Treatment completed	Successful treatment	Died	Failed	Interrupted	Transferred
Eastern Cape	47	13	60	6	1.5	13	20
Free State	64	5	70	10	2.0	9	10
Gauteng	58	10	68	9	1.7	13	9
KwaZulu-Natal	37	22	59	9	1.3	12	19
Limpopo	53	13	66	11	0.6	10	12
Mpumalanga	50	17	68	9	2.1	13	8
Northern Cape	47	12	59	7	1.5	8	25
North West	59	6	65	6	2.8	16	10
Western Cape	66	6	71	4	1.5	12	12
South Africa	54	12	65	7	1.6	12	14

Source: NTCP, NDoH

Table 8: Treatment outcomes for new smear positive cases per year (%)

	Cure rate	Successful treatment rate	Interruption rate
1996	54	73	18
1997	57	73	19
1998	60	73	19
1999	60	72	17
2000	54	63	13
2001	54	66	12

Source: NTCP, NDoH

Information on other case holding and programme management indicators included in the MTDP are not available on a national basis.

Analysis

Since its establishment in 1996, the NTCP has achieved considerable success in a number of areas. TB control has been identified as a priority at national and provincial levels, standardised policies, guidelines and treatment regimes have been developed, and the DOTS strategy has been implemented throughout the country. The recording and reporting system is well-established, with all public health facilities maintaining TB registers and submitting regular reports. This allows the NTCP to identify and provide additional support to districts which are

performing poorly. Standardised drugs regimens have been introduced, and considerable effort expended in ensuring regular supply of all TB drugs at PHC level. The NTCP has also worked closely with the National Health Laboratory Services and other role players in an effort to ensure adequate access to laboratory services throughout the country. Partnerships have been developed with a range of role-players including local NGOs (such as South African National TB Control Association (SANTA), The TB Alliance DOTS Support Organisation (TADSA)), the academic research community, and other government departments, whilst technical assistance is provided through a number of international agencies such as WHO, International Union for TB and Lung Disease, the Department for International Development (DFID), the Centers for Disease Control and Prevention (CDC) and the Belgian Government.

However these improvements in the overall management of the NTCP have not translated into effective control of the TB epidemic – the incidence of TB continues to grow, whilst cure rates remain unacceptably low, and treatment interruption rates unacceptably high.

The TB epidemic is fuelled by the HIV epidemic. HIV infection is the greatest individual risk factor for TB with both diseases predominantly affecting people in young productive age groups. HIV infection in a person who is already infected with TB increases the risk of developing tuberculosis disease from 10% in a lifetime to 7-8% per year. HIV prevention and integrating HIV and AIDS care are therefore key to controlling the TB epidemic. Pilot projects on integration of TB, HIV/AIDS, and STI services have been established in several districts, and training programmes for joint TB/HIV control activities have been

established in each province. As from the 2004/05 financial year, integrated TB/HIV care will be provided in all districts. All TB patients will be offered voluntary testing and counselling, whilst all clients who test HIV-positive will be offered screening and treatment for (or prophylaxis against) TB.

A number of constraints to effective TB control efforts at district level are apparent, with inadequate human and financial resources having been identified as constraining factors. Because TB control is provided as a component of comprehensive PHC services, information regarding financial resources allocated to these efforts is not readily available. Likewise, although each province has only a small team dedicated to TB control efforts, district level managers and health care providers should dedicate a significant portion of their time to TB control. The extent to which this happens has not been measured, nor are norms and standards available. Furthermore, implementation of TB control programmes in a decentralised health system rely on well-functioning PHC services and management systems at the district level, which are often outside of the control of TB control programmes at national, provincial and district levels. Adequate transport, supervisory, drug management and information systems need to be in place at the district level in order to ensure good TB control outcomes. The political commitment required to drive TB control efforts at the provincial level is often lacking or difficult to sustain, and the many competing demands placed on health service providers and managers at district and facility level result in TB control efforts often not receiving the priority status they deserve. The two case studies included in this chapter outline some of the obstacles to delivery of adequate TB services experienced at district level in two under-resourced districts in the Eastern Cape. The second case study also highlights how TB control efforts can be strengthened, and significant improvements demonstrated, with minimal additional resources.

Provision of Directly Observed Treatment (DOT) is one of the key components of the DOTS strategy. Whilst in urban areas health facility staff or treatment supporters supervised by health workers can provide DOT, in rural areas treatment supporters are often widely dispersed and poorly supervised. Although small-scale DOT support programmes have proved successful in improving adherence and cure rates (see Case Study 2), such programmes have proved difficult to replicate on a large scale. Systems for supporting and supervising community-based volunteer DOTS supporters, especially those working in rural areas, have often been weak and such programmes have often proved difficult to sustain over time.

Public health facilities provide the bulk of TB services and have formed the focus of most TB control efforts. However it is also important to include other service providers such as prison

services, the mines and the private sector. Ensuring collaboration with and inclusion of data from these service providers in the recording and reporting system remain a challenge for the NTCP.

Conclusions and Recommendations

Advocacy to ensure sustained political commitment

Ongoing advocacy is required to ensure that TB control remains a national priority and that this translates into the availability of adequate financial and human resources at national, provincial, district and facility levels.

Strengthening district level capacity for management and provision of TB services

Although all districts are now implementing the DOTS strategy, staff in many districts still require training and ongoing support. The recording and reporting system allows the NTCP to identify provinces and districts which are performing poorly, and to provide them with additional support. More emphasis should be placed on improving the capacity of provincial TB managers and trainers to train and support weaker districts.

Strengthening of support systems at district level

Adequate TB control is critically dependent on a number of district level support systems including transport, drug supply management and supervision. Weaknesses in these systems which contribute to poor TB control need to be identified and overcome.

Improvement in data quality and use at district level

The TB recording and reporting system provides a useful management tool for managers at national, provincial and district levels. Often however the quality of information collected at facility and district levels is poor and seldom used for improving service delivery. Ongoing training of staff in the use of the registers is needed and clear guidelines regarding the use of the register and calculation and interpretation of indicators should be provided.

Provision of integrated TB and HIV/AIDS care

Expansion of the NTCP to include VCT and provision of TB prophylaxis to HIV-positive patients is welcome, and implementation of the DoH's comprehensive treatment plan for HIV/AIDS also provides opportunities for expanding the provision of integrated TB and HIV/AIDS care. However ensuring adequate implementation of these additional services will require considerable effort. It is also important that TB control efforts amongst HIV negative patients are not compromised.

Strengthening of partnerships

Partnerships with non-governmental and community-based organisations need to be developed and strengthened. Partnerships with the private sector, in particular the mining sector as well as with general practitioners, also need to be strengthened.

Strengthening of treatment support programmes

Models for robust treatment supporter programmes need to be developed and implemented on a wide-scale. Supervision and ongoing support of treatment supporters have been identified as key to the success of these programmes, and innovative ways of achieving this need to be developed.

Case Study 1:

Constraints to effective TB Control in Alfred Nzo Sub-District, Eastern Cape

Alfred Nzo District, which borders KwaZulu-Natal near Kokstad and Matatiele, is one of the six district municipalities of the Eastern Cape. As part of the old Transkei it is an extremely poor rural area with limited resources. It has three sub-districts, Umzimvubu, Umzimkhulu and Maluti. Umzimkhulu is a unique sub-district in that it is an island of the Eastern Cape within KwaZulu-Natal.

The Eastern Cape has an extremely high incidence of TB (675 per 100 000). Together with the other eight provinces, the Eastern Cape provincial DoH has identified TB control as a priority; likewise each of the six districts has been expected to prioritise TB control and allocate sufficient resources to this end. However, as can be seen in the table below, Alfred Nzo District is performing very poorly with regard to the key NTCP indicators.

Key Obstacles to Effective TB control efforts in the District

Lack of priority accorded to the NTCP and other health programmes

In theory the NTCP is a priority for the DoH in the Eastern Cape. In reality administrative tasks often assume priority. Sub-district offices are seen as administrative extensions of the provincial office. Sub-district managers spend up to 75% of their time in the provincial capital attending meetings. Many of the tasks they are expected to attend to when in the sub-districts are administrative and, although considered a priority by the province, have little impact on their core task of implementing PHC services and managing the NTCP.

Lack of adequate financial resources

During the demarcation process of 1996 the district of Maluti ceased to exist and was divided between Umzimvubu and Elundini. However, at the beginning of 2003 provincial politicians decided to recreate the health sub-district of Maluti. A number of staff who were based in Elundini were moved back to Maluti to form the nucleus of the sub-district management team, but the team was not supplied with financial or material resources to manage and deliver services.

For example, there is not a single vehicle available to assist in health service delivery within Maluti. This affects the implementation of the NTCP in many ways. Health workers have devised a number of ingenious options to ensure sputum specimens are delivered to the laboratory and adequate drugs are available in the clinics:

- ◆ Clinic staff arrive in taxis (public transport) once a month at the sub-district office for a study day. They come to this study day laden with all the sputum specimens collected in their clinics over the last month as well as with their drug

Table 9: Key Indicators for TB control in the Alfred Nzo District, 3rd quarter 2003

Key Indicators	Umzimkhulu	Umzimvubu	Maluti	National Target
Turn Around Time (days)	30	3 +	14	2
Smear Conversion Rate (%)	50.6	60.8	34	85
Cure Rate (%)	7.5	Not available	45	85
Interruption Rate (%)	3	Not available	Not available	< 5
Clinics experiencing stock-outs of key TB drugs in September (%)	5.9	Not available	Not available	0

Source: Maluti: District Information Officer, 1 March 2004
Umzimkhulu: District Information Officer, 1 March 2004
Umzimvubu: CDC, 1 March 2004 (information available does not include Sipetu)

orders. They return with results for specimens which are available and as many drugs as they can carry on the taxi.

- ◆ All patients who attend the clinics are charged a fee of R2. This money is used to pay taxi drivers to transport sputum specimens to the laboratory and to collect results.

Although these local attempts to address the transport problems are commendable, other national policies such as free health care services at a PHC level are compromised. The implementation of programmes such as the NTCP is severely compromised.

Lack of an efficient and effective Transport System

Lack of transport within Umzimkhulu sub-district has had considerable negative impact on the NTCP in the area. Although Umzimkhulu has a transport fleet of twelve vehicles, only three are in a working condition. This severely curtailed the collection of sputum specimens from clinics and the travelling of PHC supervisors and the Communicable Disease and TB Coordinators to clinics. Recently, when the newest of these vehicles was delivered, the TB Team of the sub-district hoped it would be used for the collection of sputum specimens and clinic supervision.

However in allocating vehicles within the district, administrative functions take priority over programmes such as the NTCP. Within less than 2 months this new vehicle had travelled 22 000 kms, most of these driven by the District Manager as she attends the myriad of meetings to which she is summonsed in the provincial capital 7 hours drive away. The vehicle cannot be sent to the garage for its first service as no other vehicle in the district is considered safe enough for the District Manager to use to travel outside the district.

As a result of transport problems, sputum samples are collected from clinics infrequently. This has considerable implications for the functioning of the NTCP within the sub-district:

- ◆ Sputum samples are not taken from suspected cases, so active case finding at a clinic level is minimal or non-existent;
- ◆ Infectious TB patients remain undiagnosed, spreading their infection throughout the community;
- ◆ Sputum samples are not taken after the intensive phase of treatment, so TB patients cannot be shown to have converted and smear conversion rates are very poor;
- ◆ Sputum samples are not taken after the continuation phase of treatment, so the cure of PTB patients cannot be proven, and the best treatment outcome possible is treatment completion.

Poor Clinic Supervision

Clinic supervision is seen by both the National and Eastern Cape Provincial Departments of Health as being of importance for the support of staff and for maintaining quality of care at a clinic level. For the NTCP clinic supervision is essential for providing in-service training, reinforcing training given, monitoring and evaluation, and support.

In the Eastern Cape the Primary Health Care (PHC) Coordinators and Programme Coordinators are expected to supervise clinics. However, as senior members of the District Management Team, the administrative demands of the provincial and national health departments take priority over implementing the NTCP and other PHC services. Planned clinic visits are cancelled with alarming regularity and months can pass without one supervisory visit taking place.

Unavailability of transport is often given as a reason for the lack of clinic supervision. This is further exacerbated by the fact that of the five people in Umzimkhulu who should be doing regular supervision, only one has a driver's license. Thus on any given day a vehicle, a driver and the coordinator have to be available. As can be expected this does not happen often.

The lack of clinic supervision has severe implications for the NTCP.

- ◆ On the job training is very limited at a clinic level;
- ◆ Training is not shared with other members of the clinic staff;
- ◆ Recording and reporting remains incomplete and inaccurate;
- ◆ Management of patients is poor;
- ◆ Drug stock-outs occur frequently;
- ◆ Staff are not supported.

Conclusion

The implementation of the NTCP at a sub-district level is dependent on a number of well run management systems including transport and regular clinic supervision. However, in Alfred Nzo it can be seen that administrative demands take priority in the allocation of transport and the availability of PHC and TB coordinators for clinic supervision. This contributes significantly to the failure of the NTCP within Alfred Nzo District. Managers are not able to determine their own priorities and to focus on their core business of implementing the NTCP and PHC services.

Case Study 2:

Improving TB Control in the OR Tambo District Municipality, Eastern Cape

One of the major constraints in the Eastern Cape Province is the poor utilisation of the recording and reporting system, which has resulted in poor quality of data and poor analysis and use of information for management.^{2, f}

The outcome of the NTCP in the OR Tambo District Municipality is generally poor, with low cure- and successful treatment rates and high interruption rates. Officially reported TB-indicators from the Eastern Cape District Health Information System for the area are shown in Table 10.

In theory it should have been possible to monitor improvements in TB control through the TB recording and reporting system. However the quality of data prior to implementation of the project was extremely poor. The "emptiness" of the registers after initial registration of patients was overwhelming (over 70%). Data for 1999 were not available, and later data were incomplete. The two hospitals in the area reported interruption rates of 14% and 33% for the second quarter of 1998^g (DHIS 2003); subsequent review of information and follow-up of patients revealed much higher interruption rates, and suggest that the statistics were unreliable. A retrospective study was therefore conducted to collect accurate statistics for the period before implementation of the project. The quality of data collection improved substantially during the intervention period. In order to assess the impact of the project, key TB indicators for 1999 (before the introduction

Table 10: Selected TB-indicators for the OR Tambo District Municipality, 1999-2001

	1999	2000	2001
Incidence (cases per 100 000 people)	505	531	499
Bacteriological coverage (%)	73	85	57
Smear conversion rate (new Sm+ patients) (%)	Not collected	61	64
Cure rate (%)	29	39	Not available
Successful treatment rate (%)	67	66	Not available
Interruption rate (%)	19	19	Not available

Source: District Health Information System (DHIS)

In 1999, a TB project which aimed to introduce community-based DOTS in two rural clinics with support from the Bambisana Hospital was established. Voluntary DOTS supporters were trained and given bicycles to allow them to undertake home visits and to report back to the clinics. During home visits (on average three times a week) the volunteers monitored patients, gave advice and assisted patients in getting medicines from the clinics. The volunteers were also responsible for taking sputum samples to the clinics. TB control efforts within the clinics, and the process for referral of patients from the hospital to the clinics, were also strengthened. Case finding through sputum collection from TB-suspects was established. The project team visited the two clinics on a weekly basis to take the sputum samples to the laboratories, bring results back, meet with clinic staff and DOTS supporters to discuss progress and problems, see patients, update records, monitor adherence, take discharged patients from Bambisana Hospital to the clinic (or home if possible) and pick up patients needing hospitalisation.

of the project) were compared with those for the period October 2000 until July 2001 (after the introduction of the project).

Main findings

The referral system between hospitals and clinics was not functioning effectively prior to implementation of the project. In 1999, 94% of the 195 patients who were transferred from the hospitals to the two clinics were never registered in the clinics' registers. Patients had to be followed-up at the hospitals, because clinics were unable to send sputum specimens to the laboratory and medicines were often out of stock.

In comparison during the intervention period most patients received their treatment from the clinics. 117 patients (61%) were supported by a community DOTS supporter, whilst 23% of patients (45 patients) were self-supervised.

Key NTCP indicators are summarised in Table 11. Far more patients were diagnosed at clinic level and case finding and case holding indicators showed significant improvements.

f Verkuijl SE, 2002, personal communication.

g District Health Information System (DHIS) Database. Data extracted 2003.

Table 11: Key NTCP indicators before and after introduction of the community-based DOTS project

	Before (1999) (%)	After (Oct 2000 - July 2001) (%)	P value
Cases diagnosed at clinic level	0.4	16.7	< 0.0001
Retreatment ratio	33.3	33.6	
Bacteriological coverage	78.2	96.4	0.0122
Smear positivity	69.2	96.4	0.0014
Smear conversion rate	44.7	64.9	<0.0001
Cure rate for new smear positive cases	18.4	46.7	0.0009
Overall cure rate	12.8	38.6	<0.0001
Successful treatment rate	22.0	71.7	<0.0001
Interruption rate	73.8	23.6	<0.0001

Patients supervised by a community DOTS supporter had a 4.7 [95% CI 1.7 - 13.1] times better chance of completing treatment or of being cured than those who were self-supervised.^h This contrasts with recent studies conducted in SA^{7,8,9} and Pakistan¹⁰ which showed that DOT did not lead to better outcomes, compared to self-administration of treatment. The results of this study have shown similar improvements to those of interventions in rural communities in KwaZulu-Natal and in other parts of the world.¹¹⁻¹⁵

Lessons learnt

- ◆ Introduction of community-based DOTS programmes, especially where these are complemented by strengthening of TB control efforts at clinic and hospital level, can result in improved case-finding and holding and treatment outcomes.
- ◆ Community-based DOTS needs to be replicated in other PHC facilities of the Eastern Cape to address the poor case-holding of local TB control programmes
- ◆ PTB can be diagnosed and managed at PHC level, if providers are supervised regularly and support systems are in place. Support systems include transport for supervision and specimens, laboratory facilities for smear microscopy, a reliable and uninterrupted drug supply and a correctly used recording and reporting system
- ◆ The referral system between different levels of health care needs to be addressed to ensure that patients reach their destination and are followed-up at the appropriate level, without having to spend scarce resources on travelling. Utilisation of correct referral documentation with clear requirements for follow-up appointments or instructions,

improved communication between hospital and clinics and provision of transport for patients discharged from hospital to the clinics to meet with clinic staff and DOTS-supporters can contribute to improved referral and case-holding.

- ◆ There is an urgent need to improve the recording and reporting system. Clear guidelines (on the use of the register and calculation and interpretation of indicators) should be provided, clinic nurses, supervisors and TB coordinators should be trained, and use and completeness of the registers should be monitored through regular supervision. Clinic staff should be encouraged to display their own indicators in their facilities, and to use the information for improving TB control in their facilities and communities.

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^h (p = 0.0016; Odds ratio 4.67; 95% Confidence Interval 1.68-13.13)

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