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Staff capacity and resources at nine Free State clinics: shortcomings in the TB programme

South Africa faces a continuously escalating tuberculosis (TB) epidemic. This article explores the extent and nature of shortcomings in intra-clinic TB programme resources and staffing. Data was gathered by means of in-depth interviews and observations in nine clinics in the Free State. The main findings of the study include the following: not all TB programme co-ordinators or implementers in the nine clinics had been formally trained in the principles of the National TB Control Programme; knowledge of TB diagnosis was limited; the treatment volunteer system was not optimally managed or utilised; policy guidelines were not available at all facilities; the recording and reporting infrastructure at some clinics was flawed; the drug, supply and equipment infrastructure at some clinics was lacking; the information, education and communication infrastructure was not utilised to its full extent, and management support was in need of improvement. The findings of this study should alert TB programme managers at the provincial, district, local and clinic levels to the existence and extent of problems at some primary health care (PHC) clinics and the urgent need to address them.

Personeelkapasiteit en hulpbronne in nege Vrystaatse klinieke: TB-programtekortkominge

Suid-Afrika word gekonfronteer met 'n voortgesette eskalerende tuberkulose (TB)-epidemie. Hierdie artikel verken die mate en omvang van tekortkominge in intrakliniek TB-programhulpbronne en -personeel. Data is ingesamel deur diepteonderhoude en waarneming in nege klinieke in die Vrystaat. Die vernaamste bevindinge van hierdie studie sluit in: nie al die TB-programkoördineerders en -implementeerders in die nege klinieke was offisieel opgelei in die grondbeginsels van die Nasionale TB Beheerprogram nie; kennis aangaande TB-diagnose was suboptimaal; die behandelingsvrywilligersisteem is nie tot sy volle potensiaal bestuur of aangewend nie; beleidsriglyne was nie in al die fasiliteite beskikbaar nie; die rekordhouding- en aanmeldingsisteme en die medikasie-, voorraad- en toerustinginfrastruktuur het te kort geskied; die inligtings-, toeligtings- en kommunikasie-infrastruktuur is nie oral ten volle gebruik nie en bestuursondersteuning sou verbeter kon word. Die bevindinge van hierdie studie behoort TB-bestuurders op provinsiale, distriks-, plaaslike en kliniekprogramvlak bewus te maak van die bestaan en omvang van probleme in sommige primêre gesondheidsorgklinieke. Daar is geen twyfel dat sulke probleme bestaan en reggestel behoort te word nie.

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TB control in South Africa is fraught with problems (cf Bamford 1999; Barron 2003; Packard 1991). In 1996 the World Health Organization (WHO) recommended that the Directly Observed Treatment Short-course (DOTS) strategy should be implemented throughout the country. Yet despite a concerted effort to do so, TB control has not yet been achieved. In fact, the TB notification rate has been increasing every year. The treatment success rate for the 2001 cohort of new smear-positive pulmonary TB (PTB) cases was only 65% and the cure rate of 54% was a far cry from the WHO's target of 85% (cf Dept of Health 2004; WHO 2004).

Apart from the fact that universal DOTS coverage has not been achieved, other factors exacerbate the problem of controlling TB, not least the concomitant HIV/AIDS epidemic. The focus of this paper is on factors in the general public health care system that negatively influence the effectiveness and efficiency of TB control. In this respect, lack of resources and inadequate staff capacity to implement the National TB Control Programme (NTCP) are of particular importance. All PHC clinics should have adequate resources and the staff capacity to diagnose, manage and support TB patients via the DOTS strategy. This article thus investigates intra-clinic shortcomings in terms of staff capacity and resources relating to the TB programme.

1. The status of TB control in South Africa and the Free State

So far DOTS has not proved to be a cure-all for successful TB control. Even after its implementation in 1996, TB remained the primary infectious cause of death among the youth and adults (Dept of Health 1998a; 1998b). There is still no sign that the epidemic is abating. As depicted in Table 1, the national TB notification rate is continuing to rise sharply, having increased from 187 per 100 000 in 1995 to 550 per 100 000 in 2003. Similarly, in the Free State, it has risen from 306 per 100 000 in 1995 to 611 in 2003.

Table 1: Selected TB case finding indicators

Year	All types of TB notification per 100 000/population[1]		Proportion (%) of PTB among all notified TB cases	
	FS*	SA**	FS	SA
1995	306	187	95.8	95.4
1996	374	269	90.9	94.1
1997	377	305	86.7	93.0
1998	398	338	85.8	92.4
1999	327	344	87.5	90.1
2000	337	346	82.6	88.9
2001	460	424	76.6	87.0
2002	494	494	81.8	85.0
2003	611	550	83.4	84.2

Source: Department of Health 2004

* FS = Free State
** SA = South Africa

While the majority of notified TB cases in the Free State and in the country as a whole present with pulmonary TB (and the others with extra-pulmonary TB), the proportion of pulmonary TB cases has declined by approximately 10% from 1995 to 2003. Elevated rates of extra-pulmonary TB are encountered in populations affected by HIV/AIDS, thus the decline in the proportion can probably be ascribed to the expanding impact of the HIV epidemic. This is because the immune system of an HIV-infected person becomes weakened to such an extent that it is less able to prevent the growth and spread of *Mycobacterium tuberculosis*, not only to the lungs but also to other parts of the body. Hence, disseminated or extra-pulmonary TB becomes more common in affected populations (Weyer 2003).

1 A rapidly improving reporting rate in both the Free State and the country at large can influence case-finding and treatment outcome indicators. The reporting rate improved from 45.4 to 82.7 between 1995 and 2000 in South Africa at large and from 67.9% in 1995 to 97.3 in 1999 in the Free State.

In embarking on DOTS, the NTCP set certain objectives (Dept of Health 2000: 7) reducing mortality and morbidity as a result of TB, preventing the development of drug resistance, and ensuring accurate measurement and evaluation of the programme. One of its short-term targets was to cure at least 85% of new smear-positive cases with the first short course of chemotherapy. From Table 2 it is evident that the NTCP has not fared well in achieving this target up to 2002.

Table 2: Selected outcome indicators for new smear-positive pulmonary TB cases

Year	Cure rate[1]		Successful treatment completion rate[2]		Treatment interruption rate[3]		Treatment failure rate[4]		Death rate[5]		Transferred[6]	
	FS	SA	FS	SA	FS	SA	FS	SA	FS	SA	FS	SA
1995	-[7]	49.9	-	71.7	-	18.0	-	5.0	-	5.2	-	-
1996	-	53.9	-	72.7	-	18.1	-	3.5	-	5.6	-	-
1997	49.2	56.6	75.4	72.7	14.2	18.6	2.8	2.4	7.6	6.3	-	-
1998	62.0	59.8	74.9	72.5	15.1	18.6	2.4	2.1	7.7	6.7	-	-
1999	66.6	60.3	75.1	72.3	14.5	17.2	2.3	1.7	8.2	8.9	-	-
2000	54.9	53.8	62.8	63.0	10.5	12.7	1.8	1.3	8.4	6.5	-	-
2001	64.1	53.7	69.3	65.4	8.9	12.0	2.0	1.6	9.4	6.7	10.0	12.7
2002	67.7	54.1	72.7	68.1	7.2	12.9	1.4	1.3	10.4	8.1	8.3	9.7

Source: Department of Health 2004

1 Percentage of patients cured as proven by smear microscopy at the end of treatment.

2 Percentage of patients cured plus those who completed treatment, but without laboratory proof of cure.

3 Percentage of patients who did not complete their course of treatment.

4 Percentage of patients not cured by the treatment.

5 Percentage of patients who died while on treatment.

6 Percentage of patients transferred out to another facility for further treatment (only calculated since 2000).

7 No data available

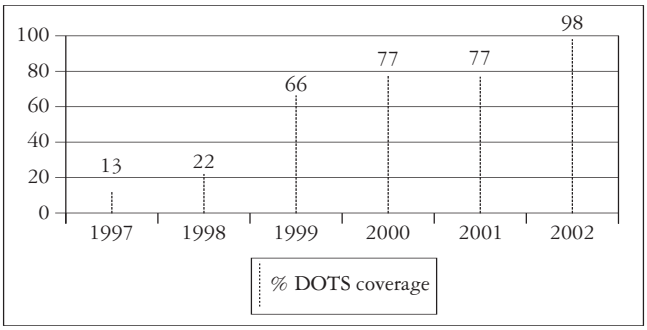
Table 2 reveals a sharp decline in the rates of cure and successful treatment completion from 1999 to 2000 for both the Free State and the country at large. However, this does not represent a real decrease,

but can be ascribed to an altered (and apparently more accurate) calculation of the TB outcome indicators. Before this alteration, recommended by the WHO, the rates of cure and treatment completion were calculated without including patients transferred from one facility to another in the course of treatment. Since 2000, such patients have been included in the denominator. Although it is disheartening for health managers and workers alike to work with lower cure rates, the new calculation system is more accurate and therefore more useful to front-line managers in that the proper cohorts of patients are reflected, rather than "generalised" outcomes, as was the case before 2000 (Kironde & Bamford 2002: 283).

Despite the changes brought about by more accurate calculations of outcome indicators in recent years, the treatment interruption rate for new smear-positive cases declined (*i e* improved) by 7% in the Free State between 1997 and 2002 and by 5% between 1995 and 2002 in the country at large. Despite the prevalent HIV/AIDS epidemic, the TB death rate increased by only approximately 3% over the same period for both the Free State and the country as a whole. The treatment failure rate for the province halved over the period (from 2.8 in 1997 to 1.4% in 2002) and improved more than three percentage points to a low of 1.5% in 2002 for the country at large.

Although the rates of treatment failure and interruption improved over the period shown in the table, the NTCP is still far from reaching its target of an 85% cure rate. But before proclaiming the DOTS programme a failure, one should take into consideration that the joint TB review undertaken in 1996 by the WHO and the South African Department of Health projected that a five-to-seven-year period would be required to implement the programme before the full impact could be seen. The report further projected that the number of TB cases in the country would decline only after the first ten years of programme implementation (WHO 1996). Nationally, DOTS was gradually rolled out from 1996 onwards. Figure 1 depicts this roll-out between 1997 and 2002.

Figure 1: Percentage of DOTS coverage in South Africa



Source: WHO 2004

Figure 1 shows that DOTS was gradually implemented in the country. Coverage had reached 98% by 2002 (WHO 2004), but had still did not reached 100% by 2004 (Idema 2004). In the Free State DOTS coverage reached 100% as early as 2000 (Peters 2004; Van der Merwe 2004). Technically, therefore, in the light of the aforementioned WHO projections, it may be argued that the programme still has time to prove itself. On the other hand, the slow pace of implementation in the country at large invites question.

2. Rationale for the study

Three factors, or clusters of factors, account for the difficulties experienced with TB control in South Africa. The first of these, the effect of the HIV/AIDS epidemic (Weyer 2003) falls within the epidemiological domain. Secondly, in the socio-economic and socio-cultural domain, limitations are imposed by the socio-economic environment and the socio-cultural composition of the majority of the public health system's clientele. Widespread poverty and poor living conditions are particularly limiting, as are certain cultural beliefs that influence health-seeking behaviour and acceptance of the allopathic healthcare system (cf Chipfakacha 1994; Friedman 1999; Rubel & Garro 1992). Thirdly, in the health systems arena, the general public health care system is limited in terms of acceptability, accessibility, quality, equity, efficiency and effectiveness. This category of limitation is particularly relevant in the context of the current paper. The public health system is responsible

for facilitating the promotion of health, the prevention of ill health, and the cure of ailments (including TB) in an acceptable, accessible, efficient and effective manner. The management of all healthcare programmes should ultimately translate into improved outcomes for patients.

In analysing the history and the current condition of the South African public healthcare system, factors such as the fragmentation, inequality and relative inaccessibility of services are pervasive problems. Since 1994 the government's introduction of a District Health System (DHS) underpinned by the PHC philosophy has partially succeeded in alleviating some of these limitations. In particular the post-1994 public health system offers largely free PHC to public clients — a contribution attempting to facilitate equal and equitable access to PHC. Free PHC implies a total transformation of health policy, practice, management and governance, and at a relentless pace which continuies to this day. Additionally, the ten-year transformation towards a DHS has posed new problems delaying successful delivery of public health care:

> What seemed to be quite a clear-cut concept in the early policy guidelines soon became a tardy exercise, entrapped in myriad conceptual, political and health service issues (Van Rensburg 2004: 152).

Significantly, Kironde & Bamford (2002: 284) warn that "ultimately an effective TB control programme depends on an adequately resourced and well-functioning [DHS]".

Van Rensburg (2004) lists an array of constraints affecting the performance of public healthcare services within the DHS, including low staff morale; the lack of a good work ethos; a lack of competence in supervisory staff; increasing workloads imposed on shrinking staff establishments; continuous crisis management; never-ending restructuring and transformation of services; high stress levels among staff; an ongoing lack of basic infrastructure, equipment and drugs; deterioration in services; fragmentation, selectiveness and lack of integration in PHC services, and so on. These constraints can only have a negative impact on the overall efficiency, effectiveness, quality, acceptability, accessibility and equity of the health service system. As the NTCP forms part of the general DHS, these factors will ultimately also influence the application and success of TB programmes in PHC clinics. Kironde & Bamford (2002) take cognisance of these kinds of problems in emphasising that nursing staff at all PHC facilities must be provided

with the resources and capacity to diagnose, manage and support TB clients through DOTS.

3. Research aim

This study was conducted to explore any problems relating to intra-clinic TB programme resources and infrastructure that may be contributing to sub-optimal TB control. The resources and infrastructure for the TB programme referred to here include human resources (both nursing staff and DOTS volunteers); training; knowledge; policy guidelines; drugs and supplies; equipment; information, education and communication (IEC) materials, and managerial support. These factors relating to staff capacity and material resources in clinics are easier to control and manipulate than factors such as widespread poverty, deep-rooted cultural beliefs and behaviour, or the HIV/AIDS epidemic. By identifying problems relating to resources, capacity and infrastructure within clinics and communicating these to personnel in clinics and to the health managers responsible for the TB programme, this study hopes to contribute to their resolution and bring about a consequent improvement in TB control. In brief, although numerous factors at all levels of the public healthcare system and beyond can lessen the effectiveness of the TB programme, this contribution will focus on selected resource- and capacity-related and infrastructural aspects within a PHC clinic setting that may potentially inhibit the health system's ability to control the TB epidemic.

4. Research design and scope

The study is exploratory and descriptive, with a research design entailing a combination of systematic, comparative case study elements and formative programme evaluation components. The larger study forming part of the Joint Free State TB Research Project (described elsewhere in this publication) systematically describes, evaluates and compares selected variables in TB (DOTS) programme implementation and application in nine PHC clinics in the Free State. The aim of this component of the larger study is to describe the situation in terms of the human and material resources available to the TB programme.

The study has the combined purpose of knowledge generation and programme improvement/refinement, but does not link TB programme outcomes to its findings as was initially envisioned. Due to incorrect and unreliable calculations of TB outcomes (specifically the cure rate) in one of the study areas (Phuthaditjhaba) this could not be done. At the time of data gathering, a large number of the patients in the study clinics in Phuthaditjhaba who had completed their treatment were wrongly categorised as "cured".[2] Thus it was not possible for the present study to link its findings on infrastructure and capacity to TB programme outcomes in order to draw conclusions on programme performance.

The nine clinics in the Free State were purposively selected, three each in Thaba Nchu (referred to as clinics A, B and C in the text), Phuthaditjhaba (clinics D, E and F) and Welkom/Thabong (clinics G, H and I). Note that the names of the clinics have been replaced by these letters to preserve their confidentiality and that of the respondents. With only nine facilities studied, this ethical consideration is of crucial importance. While no claim of representativity can be made for the sample, it is accepted that such a purposive sample does offer important insights into tendencies and possible problems (Babbie & Mouton 2003: 166). Certainly, in a situation characterised by transformation and scarcity of resources, the observations in the facilities sampled are suggestive of wider-ranging conditions. The three geographical areas were selected in order to ensure the inclusion of a wide range of variables associated with a higher incidence of TB. Together, these three areas include such diverse profiles as high-density urban and low-density rural settlements; modern (Western) and traditional (African) lifestyles; severe poverty and concomitant poor living conditions; wealthy farming, mining and industrialised communities; historically inadequate and under-resourced health services; a mobile local population (migration); underdevelopment; a high incidence of TB and HIV, and strong traditional health beliefs.

2 Nurses in the Phuthaditjhaba were re-trained approximately a year later not to categorise patients as "cured" unless five-to-seven-month sputum samples had been tested and yielded a negative result (Peters 2004).

5. Data-gathering and analysis

Data was gathered cross-sectionally between November 2001 and May 2002. Two research instruments were utilised. The first was a structured interview schedule. The main themes addressed in this schedule included: the TB programme training of nursing staff; diagnostic, clinical treatment and directly observed therapy (DOT) practices; managerial support; support services, including referral hospitals, laboratories and dispensaries; record-keeping; the organisation of TB care, and the role division of nurses in respect of the TB programme. This instrument was applied in face-to-face in-depth interviews with the TB programme co-ordinator/implementer at each clinic. This person was either the assigned TB co-ordinator of the clinic, or — in the absence of such a designated officer — the person who worked most directly with the TB programme. Professional nurses — who were also the TB co-ordinators — fulfilled this function at eight of the clinics, and an enrolled nurse at the ninth. The nine interviews were conducted by the author. Eight of the nine respondents were female and one male. Despite assurances that their participation in the study was voluntary, none of the respondents refused to participate.

The length of time it took to complete the interview schedule was an ethical consideration during the data-gathering phase. Because all interviews were conducted with a single respondent at each clinic, they inevitably intruded on these persons' time, taking three to four hours to complete. In an attempt to address this problem the interviewer did not try to complete an interview in a single session, but rather made reappointments at times that best suited the respondents and intruded as little as possible on their clinical work. Appointments were usually scheduled for the afternoons, when fewer patients attend clinics. It was crucial to the interviews to achieve sufficient rapport with the respondents to facilitate completion of the data-gathering. Interviews were completed in three to five visits to each facility and were interrupted whenever patients required the interviewee's attention.

The second instrument consisted of a list of TB programme items observed in each clinic. Because the observation schedule did not entail interviewing staff, it was less intrusive. Observations were made to determine the availability of policy guidelines, TB programme drugs, supplies and equipment, and IEC materials in the facilities.

In the construction of the above-mentioned instruments, the capacity, resource-related and programme application variables relating to the TB programme were identified mainly from three South African policy documents and one international policy document — *The South African tuberculosis control programme: practical guidelines* (Dept of Health 2000); *The primary health care package for South Africa*, which consists of two documents: *The primary health care package for South Africa: a set of norms and standards* (Dept of Health 2001a) and *A comprehensive primary health care service package for South Africa* (Dept of Health 2001b), and the WHO's *Tuberculosis handbook* (1998).

In the analysis of the data each clinic was treated as a case study. Where data was missing or unclear, the researcher re-established contact with respondents to rectify such problems. Where quantification of observations was useful, frequency tables were constructed by hand — the sample of nine clinics being sufficiently small not to warrant computerisation of the data.

6. Findings: TB programme resources and infrastructure

6.1 TB programme-related training of staff

Government commitment is an important precept of the DOTS strategy. The South African government committed itself to DOTS in 1996 (Dept of Health 1998), and again in 2000 by signing the *Amsterdam Declaration to Stop TB* (Kironde & Bamford 2002). It may thus be assumed that it was prepared to invest adequate resources in the DOTS programme, and, among other things, to train the necessary numbers of health managers and workers in the DOTS strategy. Moreover, *The primary health care package* (Dept of Health 2001a) pronounces that all nursing staff in clinics working with TB patients should be able to initiate and follow up TB treatment according to the most recent recommended TB management regimens and protocols. This implies that such nurses should be adequately trained in the application of DOTS. The PHC Package further specifies that every clinic should have at least one staff member with further education and training in TB management. As is shown in Table 3, this norm was not achieved by all the clinics studied.

Table 3: TB training among personnel

Area	Clinic	TB programme training status of respondents	Satisfied with quality of own training?	TB training status of professional nurses other than respondents
Thaba Nchu	A	✓	✓	All trained
	B	✓	x	All trained
	C	✓	✓	All trained
Phuthaditjhaba	D	✓	x	Some trained
	E	x	-	None trained
	F	✓	✓	None trained
Welkom/ Thabong	G	✓	x	Some trained
	H	x	-	Some trained
	I	✓	x	All trained

✓ = yes; x = no

Table 3 shows that seven of the nine respondents at the clinics had received formal TB programme training apart from their basic nursing training. Of the seven trained nurses, four were dissatisfied with the quality of their training. Also, in only four of the nine clinics had all other professional nurses been trained in the TB programme. Notably, three of these four clinics were in Thaba Nchu. In one of the clinics in Phuthaditjhaba, no professional nurses had been trained in the TB programme apart from their basic nursing training. One nurse had been trained, but she was on extended study leave of over six months on the day of the fieldwork. Consequently another (untrained) nurse (the respondent) had taken over responsibility for the TB programme without having been trained or even having the support of a trained person. She reported frequently phoning the acting manager in charge of the TB programme for support, but frequently finding him/her inaccessible. Consequently, when uncertain, she referred TB patients to another clinic. In another of the facilities in Phuthaditjhaba, only one professional nurse (the TB co-ordinator) had been trained. Apart from these two clinics in Phuthaditjhaba, all the other facilities had at least two (and sometimes more) professional nurses trained in the TB programme.

A respondent in Thaba Nchu indicated that some of the personnel at most facilities received more intensive training than others (some formally and others more informally, or in-service). It was also reported that some nurses were more dedicated than others, and the ones who were less dedicated neglected to do their work well and did not take responsibility for their role in the programme.

A respondent in the Welkom/Thabong area expressed discontent about the fact that the designated TB co-ordinator at this clinic attended training workshops even though s/he hardly ever actually worked with the TB programme. The respondent felt that training workshops should be attended by those responsible for the programme on a day-to-day basis. This respondent further reported that the in-service training received upon the return of the designated TB coordinator from training workshops was inadequate and rushed.

One of the respondents in the Welkom/Thabong area expressed a need for more intensive TB training for all personnel at the facility. Only two professional nurses at the facility where she co-ordinated the programme had been formally trained, while the others received only in-service training, and the respondent felt that all nursing personnel should attend an official training course.

6.2 TB programme knowledge among respondents

The mere fact that somebody has received formal training is not always a guarantee that s/he knows or has internalised the content of the training material. This was aptly illustrated in this study. Nine question items testing knowledge and focusing on PTB diagnosis were utilised. These items were derived from *The South African tuberculosis control programme: practical guidelines* (Dept of Health 2000). Together these questions tested respondents' working knowledge of the algorithms explicating PTB diagnosis in new and re-treatment cases (also found in the policy guideline mentioned above). In this way it was revealed that the respondents' knowledge was less than one would expect from health workers who knew the policy and had to work with TB patients every day. The correctness/incorrectness of their answers is depicted in Table 4.

Table 4: Knowledge about TB diagnosis

Knowledge indicator	Thaba Nchu			Phutha-ditjhaba			Welkom/ Thabong			Total correct answers out of nine
	A	B	C	D	E	F	G	H	I	
Two sputum samples (if available) are needed to make a diagnosis of PTB	✓	✓	✓	✓	✓	✓	✓	✓	✓	9
The correct definition of sputum turn-around time	✓	x	x	✓	x	x	✓	x	x	3
A positive TB diagnosis in children should be ruled out before putting children who have had contact with TB patients on prophylaxis	✓	x	x	✓	x	✓	✓	x	x	4
A chest x-ray should be done if one of the first two sputum samples of a new patient with signs and symptoms is negative, before a third sputum direct test is requested	x	✓	x	✓	✓	✓	✓	x	✓	6
A patient with signs and symptoms of TB with two negative smears should be put on a course of broad spectrum antibiotics for seven days	x	x	x	✓	x	✓	✓	x	x	3
If one of the two required sputum smears of a new patient still shows positive results after two months of treatment, a third month of intensive treatment should be added	x	✓	x	✓	✓	✓	✓	✓	✓	7
If one or both sputum smears of a re-treatment patient show positive results after three months of treatment, a culture and susceptibility test should be requested and continuation phase should be commenced	✓	✓	✓	✓	✓	✓	x	x	x	6
New patients in the initial phase of treatment should be started on the re-treatment regimen if ten or more doses of medication have been missed	✓	x	x	x	✓	x	x	✓	x	3

Table 4: Knowledge about TB diagnosis (continued)

Knowledge indicator	Thaba Nchu			Phutha-ditjhaba			Welkom/ Thabong			Total correct answers out of nine
	A	B	C	D	E	F	G	H	I	
New patients in the continuation phase of treatment should be tested when more than two months of treatment, in total, have been missed; when sputum is smear-negative, the continuation phase should be completed; if sputum is smear-positive, re-treatment should be started	✓	x	✓	x	x	✓	✓	x	x	4
Total correct answers per facility (out of nine)	6	4	3	7	5	7	7	3	3	-

✓ = Respondent provided a correct answer.
x = Respondent provided an incorrect answer.

Table 4 shows that all respondents knew that two sputum samples (if available) are required to make a diagnosis of PTB (n=9). A number of respondents (clinics indicated in brackets), however, responded incorrectly to the other eight questions posed.

From the table it can be concluded that the respondents in the Phuthaditjhaba area had the best knowledge of PTB diagnosis according to the standardised algorithms on PTB diagnosis in *The South African tuberculosis control programme: practical guidelines* (Dept of Health 2000). Of the nine questions asked, only two were answered incorrectly by two respondents, while four were answered incorrectly by the one respondent. In both the Thaba Nchu and Welkom/Thabong clinics, between two and six questions were answered incorrectly by each respondent. Surprisingly, the respondent at the clinic in Phuthaditjhaba area who had not received formal or in-service TB training, answered five of the nine questions correctly, actually faring better than four of the officially trained respondents. On the other hand, the enrolled nurse in the Welkom area, who had not been formally trained either, fared poorly, answering only three of the nine questions correctly.

6.3 DOTS volunteer systems

As part of the WHO's DOTS strategy, (directly) observing patients while they ingest their medication has been shown to improve adherence to treatment. This is known as directly observed therapy (DOT) and is a crucial element of the DOTS strategy. It is therefore important to ensure that, as far as possible, TB patients receive DOT (Dept of Health 2000). In the nine clinics studied, the majority of TB patients were required to visit the clinic for directly observed therapy (DOT) every time they had to take medication (five days a week), at least for the intensive phase of their treatment (which lasts between two and three months). This is time-consuming, expensive and inconvenient for patients. That is why clinic-linked volunteers who assist nurses with DOT and are known as DOTS supporters or volunteers play an important role in the NTCP. After volunteering their services to the TB programme at their local clinics, they are usually trained by a professional nurse or an NGO. They can assist with DOT in clinics, but more importantly, they can facilitate community outreach by taking medication to TB patients. In cases where there is no community-based DOTS supporter (family member, neighbour, teacher, employer, and so on), the clinic-linked DOTS supporter can fulfil that role. Furthermore, clinic-linked DOTS supporters can assist professional nurses by observing the condition of patients at home. Professional nurses rarely have the time for home visits. DOTS supporters can also assist in tracing patients who interrupt treatment.

It is therefore of great concern that the Welkom/Thabong clinics, which are situated in Lejweleputswa, the district municipality with the highest TB incidence in the Free State, had the fewest DOTS supporters. In fact, two of the three clinics had no volunteers at all. The third had five. The two clinics without DOTS volunteers had reportedly "lost" their volunteers as a result of "politics". Whatever the explanation, it is worrying to lose volunteers in an area with such a high TB case load. What is more, the three clinics are in relatively close proximity (no more than five to seven kilometres apart, at most) and it is difficult to understand why one of the facilities was able to recruit and retain its DOTS volunteers, while the others were not.

The sampled clinics in the Phuthaditjhaba area had respectively one, four and 18 DOTS supporters. At the best-supplied clinic DOTS

supporters perform home visits, take medication to patients, observe the ingestion of their medication at home, and trace defaulters. At the other two clinics, no home visits are made by the volunteers; rather, they assist the TB programme in the clinic and occasionally trace defaulters. Again, these three clinics are in close proximity (between five and seven kilometres apart) and the question arises as to why the TB co-ordinator at one clinic has the ability to recruit eighteen supporters, while those at the other two could only manage to recruit so few. The discrepancy in nurses' views as to how many DOTS supporters they need and their success in retaining such DOTS supporters appears to differ significantly among facilities.

The three sampled clinics in the Thaba Nchu area had 22, 20 and 18 volunteers, respectively. They worked in the clinic as well as in the community, directly observing patients taking their medication, reporting to the clinic personnel on the condition of the patients assigned to them, and doing TB-related health education in the clinics. In one clinic, they were also in charge of a vegetable garden.

6.4 Availability of policy guidelines

All the information reported on thus far was derived from face-to-face interviews. The rest of the information reported was drawn largely from observations made in the nine clinics.

The primary health care package for South Africa (Dept of Health 2001b: 38, 39) stipulates that all clinics should have, among other things, at least one copy of the latest protocols. To determine whether this was the case, respondents were asked to present the researcher with a copy of *The South African tuberculosis control programme: practical guidelines* (Dept of Health 2000). The researcher further determined, by observation, whether posters depicting the nationally standardised algorithms for diagnosing PTB in new and re-treatment patients were displayed in the clinics. Table 5 shows the results.

Table 5: Availability of policy guidelines in clinics

Knowledge indicator	Clinic									Total items available (out of nine clinics)
	Thaba Nchu			Phutha-ditjhaba			Welkom/ Thabong			
	A	B	C	D	E	F	G	H	I	
Copy of the *South African TB Control Programme: practical guidelines* 2000	x	✓	x	✓	✓	✓	x	✓	✓	6
Flow chart for diagnosis of PTB for new-patients (algorithm poster)	✓	x	✓	x	✓	✓	✓	✓	✓	7
Flow-chart for diagnosis of PTB for re-treatment patients (algorithm poster)	✓	x	✓	✓	x	✓	✓	✓	✓	7
Total items available per facility (out of three)	2	1	2	2	2	3	2	3	3	-

✓ = yes; x = no

In three of the nine clinics (A, C and G), respondents could not produce a copy of *The South African tuberculosis control programme: practical guidelines*. Not only did the respondents in these clinics not have the necessary knowledge (as described in 6.2), they had no source to refer to in the clinic either, apart from other nurses, who had probably received even less training with reference to the NTCP. It was also observed that, while six of the nine clinics had the protocols available, locating them sometimes took much time and effort. In three of the clinics, the document could not be produced even with the concerted efforts of all staff members.

With reference to the algorithms for diagnosing and treating new and re-treatment PTB, six of the nine clinics displayed both on their walls, while two clinics displayed only one, and one clinic neither. In only three of the nine clinics were all three policy guideline items available.

6.5 TB case-recording

TB registers, TB patient files and TB patient carry cards are nationally standardised case recording materials, and contain (collectively) the details of each patient, including, among other things, biographical and demographic information, contact details, the type of TB, the diagnostic tools utilised and their outcomes, treatment dosage information, DOT information, contact tracing information, and so on. TB registers and patient files are kept at the clinics while carry cards are kept by patients. In addition to interviewing the nine respondents with reference to the recording system, the TB registers and TB patient files were scrutinised.

It was observed that standardised TB registers, patient files and carry cards were in use at all nine clinics. However, closer scrutiny of the registers and patient files revealed that the completion of these TB case recording materials was fraught with error. The most important mistake identified in the TB registers was the fact that some of the cases were categorised as "cured", whereas no third sputum result had, in fact, been recorded. This was particularly the case in the Phuthaditjhaba area. This problem was also identified by the provincial TB co-ordinator and as a result, reinforcing training was introduced (Peters 2004). Mistakes in patient files included, in some cases, the omission of TB case contact follow-up details, DOT supporter information, or follow-up patient mass.

It was found that more than one person was responsible for record keeping in some of the clinics. This reportedly caused numerous problems. All the respondents except one indicated that not all nursing personnel used the recording system correctly and that many mistakes were made, leading to faulty statistical data being reported at the provincial level. Most of the respondents expressed frustration at the fact that not all those who use the register take care to do so correctly and that it is sometimes completed in a non-standardised manner.

Respondents were also asked to produce unused copies of clinic-kept TB patient files and carry cards. These two items were used as indicators to measure the availability of recording stationery at the clinics. Three of the clinics in the Welkom/Thabong area (G, H and I) had no unused TB patient files and had to rely on photocopies. All the clinics had blank TB patient carry cards.

6.6 Drugs, supplies and equipment

The availability of certain TB drugs in the clinic dispensaries and "TB rooms" was monitored. As specified by the then protocol, these drugs included combination rifafour (RHZE)[3], combination RH 150/100 and RH 300/150 and combination RHZ 60/30/150 (for use in children), as well as streptomycin injectables for re-treatment patients. Spot checks were also done for expired drugs — none of which were found in any of the clinics. One of the clinics in the Phuthaditjhaba area had no stock of rifafour.

Observation of the availability of supplies and equipment items included adult and baby/infant scales (in working condition), sputum jars, syringes and needles (used for streptomycin injections), skin tests for TB, as well as sharps disposal containers. All the clinics were equipped with the majority of these items, but two in Thaba Nchu reported that they often experienced difficulty in obtaining sufficient sputum containers/jars. Skin tests for diagnosing TB in children were also unavailable in one of the Thaba Nchu clinics.

6.7 Information, education and communication materials

The primary health care package for South Africa (Dept of Health 2001a) stipulates that all clinics should have leaflets and pamphlets in the local languages for distribution, as well as TB posters displayed on the walls. Table 7 depicts the observations made in each of the clinics with respect to the availability of posters and pamphlets.

3 R = Rifampacine; H= Isoniazid; Z=Pyraszinamide; E=Ethambutol.

Table 7: Availability of IEC poster and pamphlet materials in the clinics

Area	Clinic	TB poster in general waiting rooms		TB poster in TB treatment room		TB pamphlets in general waiting rooms		TB pamphlets in TB treatment room	
		Local language	English	Local language	English	Local language	English	Local language	English
Thaba Nchu	A	x	x	✓	✓	x	x	x	x
	B	✓	✓	✓	✓	x	x	x	x
	C	x	✓	✓	✓	x	x	✓	✓
Phuthaditjhaba	D	x	✓	x	✓	x	x	✓	✓
	E	✓	x	✓	✓	x	x	✓	✓
	F	x	x	✓	✓	x	x	✓	✓
Welkom/ Thabong	G	✓	✓	✓	✓	x	x	x	x
	H	✓	x	✓	✓	x	x	✓	✓
	I	✓	✓	✓	✓	✓	✓	✓	✓

✓ = yes; x = no

Only five of the nine clinics displayed TB posters in a local language in their general clinic waiting rooms and only one clinic had pamphlets in the local language available there. Only in one of the nine clinics were poster and pamphlet materials available in both a local language and English in both the general clinic waiting rooms and the TB treatment rooms. There were slightly more English than Sesotho or Setswana posters. Pamphlets, where available, were all multilingual. It was observed that the nationally available pamphlet and poster materials were not fully utilised in the clinics.

6.9 Supervision and support

According to the PHC Package (Dept of Health 2001a) all clinics should receive a six-monthly quality assessment by a TB programme supervisor. The respondents were asked to indicate whether they had been visited by a TB programme supervisor in the preceding six months. The respondents' perceptions of the supervision and support of their TB programme were also assessed. Six of the nine respondents (all those in the Welkom/Thabong and Thaba Nchu areas) indicated that they

had been visited. The three respondents in the Phuthaditjhaba area indicated that they had not. There was no specially designated TB co-ordinator in this local service area (LSA) at the time of the field-work, and the manager responsible for the TB programme in this LSA also had other time-consuming portfolios on her hands. The hands-on support and supervision of the TB-programme at the clinic level was thus in jeopardy in the areas.

Two of the respondents in the Welkom/Thabong area indicated that they were very satisfied with the provision of managerial support. They indicated that they were visited monthly for no less than an hour and that their working relationships with the manager in question were good. Furthermore, they reported that they received adequate feedback on their monthly/quarterly reports during the visits. The respondent at the third clinic in this area was negative about the support provided, and reported that the Local Service Area (LSA) TB co-ordinator did not visit the clinic regularly enough.

Respondents at two of the clinics in the Phuthaditjhaba area indicated that they had experienced major problems in terms of the accessibility of the acting TB programme supervisor (there was no official supervisor appointed at the time of data-gathering). The respondent at the third clinic indicated that the acting TB programme supervisor was quite easily accessible by phone, but visited the clinic only about once a year. Monthly to quarterly meetings, attended by clinic TB co-ordinators, were held at a central venue in the local area. Despite the lack of supervision reported by two of the three respondents, none reported problems in their working relationship with the manager.

Respondents in the Thaba Nchu area were all satisfied with the support received from their area TB co-ordinator, who reportedly visited the three clinics on a monthly to quarterly basis for anything between two hours and a full working day. In addition to these clinic visits, monthly meetings were held with all clinic TB co-ordinators in this LSA. Respondents further reported that they all had good working relationships with the co-ordinator. Respondents at two of the clinics indicated that they had experienced problems with support for the TB programme at higher government levels and, specifically, with the lack of resources made available by higher authorities. They reported both subsidised transport for home visits and defaulter tra-

cing as major problems. One of the respondents indicated that she had to use her own funds for home visits and to trace patients, as nothing had been done about the lack of subsidised transport at most clinics.

7. Discussion of findings

The main findings of the study include the following: not all TB coordinators had been formally trained in the principles of the NTCP; knowledge of TB diagnosis was incomplete; the treatment volunteer system was not optimally managed or utilised; policy guidelines were not available in all facilities; the recording and reporting infrastructure in some clinics was unreliable; the drug, supply and equipment infrastructure in some clinics was lacking; the information, education and communication infrastructure was suboptimal, and management support needed improvement.

It is clear from this study that the training situation in respect of TB control programme differs substantially among the various clinics and areas. In Thaba Nchu, all the professional nurses had been trained to render a TB service according to the protocol, while in the other two areas only some of the professional nurses had been so trained. It was of great concern to find that at two of the clinics the person working with the TB control programme had not been officially trained.

From the findings in Table 4 it can be concluded that the knowledge required to diagnose and treat TB had not been internalised by the respondents. Nursing staff other than the respondents may be expected to be even less knowledgeable, as most of them had not undergone training and did not work with the programme to the extent that the respondents did. The situation was aggravated by the fact that the necessary policy guidelines were not available for reference at all of the clinics.

The implication of the collective findings on both the respondents' knowledge and the availability of policy guidelines can only be that TB patients might not in all cases be diagnosed and treated according to the set guidelines. When the policy guidelines are not available in a clinic, this can be seen as an omission by the person responsible for the TB programme.

The limited knowledge of the respondents in respect of TB control makes it imperative that they be thoroughly trained. Provincial and local TB control managers should ensure that those given responsibility for the TB programme at the clinic level are properly trained. Admittedly, this is difficult due to the high mobility of nurses in certain areas, whether to other areas or clinics, or other programmes in the same clinic (rotation), or to other countries. However, the lack of trained staff can seriously affect the outcome of TB treatment and should be attended to.

With the exception of Thaba Nchu, not many nurses, other than those working directly with TB patients on a daily basis, were trained in the TB programme. The training range of clinic nurses in some areas of the Free State is known to be quite poor. As was also evident from this study, not all professional nurses are trained to perform the full spectrum of services rendered by PHC clinics. This makes the functional integration of services at the clinic level difficult, often causing a situation of functional specialisation within clinics, which implies the verticalisation of programmes at this level.

Although clinic supervision, in-service training and reinforcing training are essential if high levels of TB programme training are to be maintained, TB co-ordinators and other nursing personnel in clinics should also take responsibility for their own knowledge and their ability to do their work. One way of doing this is by reading and internalising protocol materials. Furthermore, they should accept responsibility for applying the TB control programme as intended and prescribed in the NTCP guidelines. Those who do not have these materials should take responsibility for requesting copies from their area TB co-ordinator or the provincial office. The availability of guidelines, however, does not guarantee that they will be used. Certainly, from the respondents' knowledge results, the information does not seem to have been internalised. Yet all the respondents except one had between twenty months' and five years' experience with the NTCP. Furthermore, all of them had worked with over 80 to 100 TB patients per year. It is therefore difficult to understand why the respondents could not recall the very basic knowledge.

The findings revealed a huge variation in the numbers of DOTS supporters as well as in the tasks assigned to them from clinic to

clinic and from area to area. This indicates that there are differing interpretations of certain aspects of the DOTS programme in the various areas. Clinics with few or no DOTS supporters are at an obvious disadvantage. It was clear from the findings that the treatment volunteer system was not being optimally managed or utilised.

The availability of standardised TB case recording materials in the clinics was found to be good. The completion of these materials was, however, fraught with problems. It is recommended that nursing staff should be trained to utilise recording materials in a correct manner and should be motivated to complete such forms meticulously. Respondents reported that a combination of time constraints, poor knowledge and poor motivation caused problems with case recording. It is also important to train all clinic nursing staff who use the recording system, not only the TB co-ordinators.

The availability of posters and pamphlets in the general waiting areas of clinics was relatively poor, especially in the local languages. Such educational materials play a very important role in a PHC clinic setting as a means of passive health education and passive case-finding for literate clients. South Africa's adult literacy rate is relatively high at 85.9% and the Free State's even higher at 88.8% (Day & Gray 2002).[4] Therefore, such materials should be very useful. It is especially important that they be displayed in the general waiting areas of clinics as patients visiting a clinic have time to read them while waiting for attention. It is important that such posters should not only be available in TB treatment rooms (where TB patients receive DOT and counselling), since the patients who pass through these rooms have already been diagnosed with and treated for TB. Rather, potential TB patients in general waiting areas should be targeted by TB posters, especially those containing information on the symptoms of TB (the most common theme for such posters). Moreover, it is important that such materials be available in the language of the population served by the clinic. Because the inhabitants of the three areas in which the clinics are situated are mostly Sesotho- or Setswana-speaking, posters should be in one or both of these languages in order to have the maxi-

4 The adult literacy rate is defined as the percentage of people aged 15 years and above who can, with understanding, read and write short, simple statements on their everyday life.

mum effect. More posters were displayed in TB treatment rooms than in waiting areas, which could suggest that they were used there for "decoration" rather than for health education and case-finding among general patients.

The necessary TB medication was found to be available at all clinics except for one in Phuthaditjhaba that had no stock of rifafour stock, which meant that new TB patients in the initial phase could not be fully treated at the clinic that day, creating a window of opportunity for the development of multi-drug-resistant (MDR) TB. In such a situation, the health system itself can then become the potential cause of MDR TB.

The selected equipment and supply items were available at most clinics. One clinic reported difficulty in obtaining sufficient sputum jars and another had no skin tests for TB diagnosis in stock These problems could point either to non-delivery on the part of suppliers, or to negligence in ordering supplies.

Clinic supervision is important both for staff support and for maintaining quality care (Bamford *et al* 2003/4). With reference to the NTCP, clinic supervision is essential for providing in-service training and supporting personnel as well as for monitoring and evaluating programme implementation, application and performance. The fact that there was no specifically designated TB co-ordinator in the LSA of which Phuthaditjhaba forms a part jeopardised hands-on support and supervision of the clinic level application of the TB-programme in the area. The manager who was deputising until an official appointment could be made also had other time-consuming portfolios on her hands. It was concluded that the quality of supervision was not optimal, as numerous problems were identified which implied poor supervision, monitoring and evaluation of the facilities. Well-supervised, properly supported facilities should have adequately trained personnel, the necessary supporting materials, and a recording system with far fewer mistakes and inefficiencies.

8. Conclusion

The capacity and resources of the NTCP in the nine Free State clinics sampled were inadequate in many respects and urgently needed attention to the numerous specific deficiencies identified. Essentially, the poor TB programme knowledge of nursing personnel working with TB on a day-to-day basis needs to be addressed. More intensive training could be a solution but nursing personnel also have to take responsibility for their own knowledge.

Van Rensburg (2004: 365) claims that "... [h]uman resources ... remain crucial to the outcomes of health sector reform". Lehman & Sanders (2002: 120) concur, stating that "... human resources determine the success or failure of health sector transformation". These authors also identified signs of "transformation fatigue" among health workers, a trend which could have detrimental effects on the health system, as well as on the quality of service delivery at all levels. It remains to be established whether this could be part of the problem at the clinics discussed in this study.

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