

Resources and infrastructure for the delivery of antiretroviral therapy at primary health care facilities in the Free State Province, South Africa

Ega Janse van Rensburg-Bonthuyzen, Michelle Engelbrecht, Francois Steyn, Nandi Jacobs, Helen Schneider, Dingie van Rensburg

Abstract

There are concerns as to whether South Africa's public health system has sufficient resources, human and otherwise, to ensure universal access to antiretroviral treatment (ART). We report on public sector implementation of the Comprehensive Care Management and Treatment (CCMT) programme in the Free State Province, South Africa, in particular whether the primary health care (PHC) infrastructure was able to mobilise the necessary inputs to effectively provide ART, without undermining other services within facilities.

A longitudinal study was conducted of the first 16 PHC facilities accredited to provide ART in the province. The facilities were visited on three occasions over 2 years, involving both structured and open-ended interviews with professional and lay staff, and observations of available resources. The resources assessed were staffing, space, essential equipment, drug supplies and laboratory systems.

Approximately one-fifth (20%) of professional nurses were allocated to the CCMT programme in the facilities, although the overall number of professional nurses increased by only 14%. This process resulted in some displacement of professional nurses towards the CCMT Programme away from other services in the facilities. However, this could have been partially compensated for by task shifting towards community health workers and the appointment of additional support staff. Staff were largely positive about the programme. Drug supplies, availability of equipment and laboratory systems, although good at the baseline, improved further over the period of observation. The lack of adequate space to accommodate the new programme was a frequently reported problem.

Overall, our assessment is that the PHC infrastructure in the Free State's public health system is capable of implementing and benefiting from the CCMT programme. Nevertheless, constraints in the availability of professional staff threaten future implementation of both the CCMT and other PHC programmes.

Keywords: Resources, infrastructure, antiretroviral therapy, primary health care facilities.

Résumé

Il y a des préoccupations à savoir si le système de santé publique de l'Afrique du Sud a suffisamment de ressources humaines et autres pour pouvoir assurer l'accès universel au traitement antirétroviral (TAR). Avec cette présente, nous présentons un rapport d'exécution du programme Compréhensif de Gestion de soins et du traitement (CCMT) du secteur public au Free State, Afrique du Sud. Surtout, les endroits où l'infrastructure de soins primaires a pu mobiliser les données nécessaires afin de mettre à disposition la TAR de manière efficace sans ébranler d'autres services des établissements.

Une étude longitudinale a été faite auprès de 16 établissements de soins de santé primaire autorisés à pourvoir la TAR dans la province. Ces établissements ont été visités à trois reprises dans l'espace de 2 ans. Pendant ce temps, des entretiens structurés et à libre discussion ont été menés auprès du personnel professionnel et ordinaire. De plus, on a contrôlé les ressources disponibles. Les ressources évaluées furent: le personnel (effectifs, déplacement et formation), l'espace, l'équipement essentiel, l'approvisionnement des médicaments et les systèmes laboratoires.

Environ 20% d'infirmiers professionnels ont été placés au programme CCMT dans les établissements, tandis que les effectifs des infirmiers professionnels avaient augmenté de 14% seulement. Ce processus a vu le déplacement de certains infirmiers professionnels

Ega Janse van Rensburg-Bonthuyzen, Michelle Engelbrecht, Francois Steyn and Nandi Jacobs are researchers at the Centre for Health Systems Research and Development, University of the Free State.

Helen Schneider is Associate Professor at the Centre for Health Policy, University of Witwatersrand and Professor Extraordinarius in the Centre for Health Systems Research and Development, University of the Free State.

Dingie van Rensburg is Professor and Director of the Centre for Health Systems Research and Development, University of the Free State.

Correspondence to: engelm.c.hum@ufs.ac.za or ejvrbonthuyzen@crsrsa.co.za

vers le programme CCMT. Cependant, cette situation pourrait être dédommagée partiellement en déplaçant la tâche vers les ouvriers de santé communautaires et en nommant davantage du personnel de soutien. Le personnel était largement intéressé au programme. Bien que l'approvisionnement de médicaments, la disponibilité d'équipement et les systèmes laboratoires soient bons à la base, on a constaté une amélioration tout au long de la période d'observation. Le problème souvent soulevé était le manque d'espace adéquat afin d'aménager le nouveau programme.

Dans l'ensemble, l'infrastructure PHS dans le système de santé publique de Free State est capable d'exécuter et de profiter du programme CCMT. Néanmoins, les contraintes de la disponibilité du personnel professionnel menacent l'avenir de l'exécution de CCMT et des programmes PHC.

Mots clés: Ressources, infrastructure, thérapie antirétrovirale, établissements de soins de santé primaire.

Introduction

There is no doubt that South Africa, with approximately 5.4 million persons living with HIV (Dorrington, Bradshaw, Johnson & Daniel, 2006) and a national HIV prevalence (antenatal) of 29.1% (National Department of Health, 2007), stands to benefit substantially from a large-scale antiretroviral treatment (ART) programme. In 2003 the South African Cabinet announced that government would provide ART in the public health sector. The policy governing the provision of ART, the Operational Plan for Comprehensive HIV and AIDS Care, Management and Treatment (CCMT) for South Africa, aims to provide universal access to ART, while simultaneously strengthening the health system. The intention of the CCMT is to add significant numbers of health professionals to the health system, and to upgrade the skills base and competencies of health care workers, as well as to improve facility systems and infrastructure (National Department of Health, 2003a). By November 2007, more than 400 000 people were reported to have accessed ART in the public health system, 18 000 of whom were receiving treatment in the Free State (National Department of Health, 2008).

ART entails lifelong treatment and labour-intensive assessment, monitoring and support of patients. Despite the vision of universal access in the CCMT, concerns have been raised about the feasibility of providing ART to large numbers of people in a resource-limited setting such as South Africa. Obstacles raised include the scarcity of trained health care providers, and insufficient infrastructure to monitor patients and provide them with medication (Harries, 2005; Kober & van Damme, 2004; World Health Organization, 2003). Others have gone so far as to suggest that an ART programme will actually weaken the health system (Barron, 2003; McCoy, 2005). In this respect, it was noted that 'Although one of the key principles of the Operational Plan is to strengthen the health system as a whole through an injection of resources, paradoxically there is concern that because of the sheer scale of the epidemic, in the short term

the demand on scarce resources may be undermining the very systems that the Operational Plan seeks to build and strengthen' (Stewart & Loveday, 2005, p. 224). However, few would disagree with the view that if universal access to ART is to be achieved, all existing health facilities, in particular primary health care (PHC) services, should be oriented towards the provision of comprehensive HIV care, and should therefore have resources and staff to diagnose, manage and support people living with HIV (Médecins Sans Frontières, 2006; Nelson Mandela Foundation/Médecins Sans Frontières, 2006).

The state of the PHC system in South Africa has been evaluated on a regular basis since 1997 (Health Systems Trust, 1997, 2000, 2004; Barron, Day, Loveday & Monticelli 2005; Barron, Day, Monticelli, Vermaak, Okorafor, Moodley & Doherty, 2006; Barron, Day & Monticelli, 2007.) An assessment of the availability, effectiveness and quality of PHC service provision in the Free State just prior to the start of the CCMT programme found that there was a scarcity of certain categories of health care personnel, especially pharmacists and social workers, as well as inadequate waiting areas (e.g. lack of seating). On the positive side, the necessary equipment, drugs, supplies and laboratory services, as well as infrastructure (i.e. adequately equipped waiting rooms with examination couches, working examination lights, basins with running water and soap, and audio and visual privacy) were in place to provide PHC in the province (Health Systems Trust, 2004).

With respect to ART provision, a qualitative study undertaken in 2004 and 2005 in the Free State revealed health workers' frustrations with the limited availability of antiretroviral (ARV) drugs in the public sector, and the subsequent capping of the number of patients who could be placed on treatment. Nevertheless, attitudes towards the ART programme among PHC providers were largely favourable (Stein, Lewin & Fairall, 2007). A study on the effectiveness of public sector ART service delivery in the Free State revealed that the programme was as successful as those provided in high-income countries.

However, it was also evident that access to treatment should be expanded and delays in commencement of treatment should be avoided (Fairall, Bachman, Louwagie, van Vuuren, Chikobvu, Steyn, *et al.*, 2008).

The Free State Department of Health made a decision to base its ART programme within the PHC system, following existing referral chains, delivered in a decentralised manner, integrated with other PHC programmes, and strongly driven by professional nurses. It adopted the '1x3 model' of providing ART, comprising a mainly doctor-driven (and to a degree also pharmacist-driven) 'treatment' site (i.e. a hospital or an upgraded community health centre) with referrals from three nurse-driven 'assessment' sites (i.e. clinics or CHCs) within the same referral chain. The assessment site serves as an entry point into the public ART programme. Professional nurses trained on ART screen and stage patients. Eligible patients are referred to the treatment site for a doctor to certify that the patient qualifies for ART. Patients visit the assessment site regularly to receive monthly drug supplies, and return to the treatment site at specific intervals for examination, advanced diagnostic procedures, renewal of ARV drug prescriptions and monitoring (Van Rensburg, 2006). In a larger, more sparsely populated district of the Free State (Xhariep), treatment and assessment sites are combined. Here a clinic or CHC serving as an assessment site is upgraded to the status of a treatment site, with a resident or visiting doctor, pharmacist, social worker and dietician providing those ART services which do not fall within the scope of a professional nurse.

This paper emanates from a larger study undertaken by the Centre for Health Systems Research and Development (CHSR&D), namely 'Public sector ART: documenting, monitoring, evaluating and facilitating the implementation of the national treatment plan in the Free State', the aim of which is to construct a 'moving picture' of the introduction, structuring, rollout and impact of the ART programme. The larger project comprises three specific foci, namely (i) regular client/patient surveys; (ii) repeated health services/systems appraisals; and (iii) continuous studying of the contexts, processes and policies amidst which the rollout of the ART programme takes place. The paper reports on public sector implementation of the CCMT programme in the Free State, in particular whether the PHC infrastructure is capable of providing ART without undermining other services. It specifically focuses on inputs (staffing, training, space, laboratory infrastructure and drug supplies) to provide ART, and whether these strengthened or weakened the broader PHC system.

Methods

The research design was longitudinal, and exploratory in nature (Babbie & Mouton, 2001). It involved wide-ranging assessments of facility infrastructure and the responses of facility staff to the new programme, from which broad themes could be inducted, rather than the testing of specific hypotheses.

The research was undertaken at all 16 PHC clinics and CHCs (distributed across the five districts) where the CCMT programme was implemented in the Free State in 2004. These facilities were selected in accordance with CCMT guidelines and are, from a resource point of view, fairly typical public sector PHC facilities. The collection of data was sequenced with the staggered rollout of the provincial ART programme in the different districts. Data were gathered on three occasions at each facility. Firstly, 4 weeks prior to commencement of the training sessions for ART staff in a particular district (starting in April 2004). The first follow-up (F1) visits took place 7 months after initiation of the ART programme in each facility, and again 13 months later (F2). Changes in the resource situation of the facilities were thus gauged over a period of almost 2 years.

There were three methods of data collection. Firstly, semi-structured interviews were conducted with facility managers, nurses responsible for the CCMT programme, and other professional nurses in the facilities. These interviews focused on staff availability over time at the facility, including for ART services; staff training; the availability of essential equipment, drugs and supplies; and the functioning of laboratory services. Secondly, detailed observation checklists were completed for the physical (as opposed to verbal) presence of certain key items (i.e. policy guidelines, drugs and other supplies and equipment). Finally, focus group discussions were held with nurses and community health workers (CHWs) to elicit their views on the impact of the ART programme in the facility.

The choice of items for the assessment of inputs (in both interviews and checklists) was guided by norms and standards documented in the 'Primary Health Care Package for South Africa' (National Department of Health, 2001), previous surveys of PHC facilities in South Africa (Health Systems Trust 1997, 2000, 2004), provincial and national ART treatment guidelines (Free State Department of Health, 2004; National Department of Health, 2004) and the essential drug list (National Department of Health, 2003b). Both the individual and group interviews assessed staff (ART and non-ART) perceptions and responses to the programme in their facility. Lay and professional staff were interviewed separately and in the language of their choice.

Interview schedules were reviewed by health care managers and workers, piloted and subsequently adapted for fieldwork. The same tools were administered in the baseline and follow-up surveys.

The fieldwork was conducted by teams of four to five trained interviewers and information gatherers. A fieldwork team supervisor ensured careful monitoring of fieldwork activities and in-field quality control of data. The same teams visited the facilities during the three data-gathering periods.

Participation was voluntary, with none of the respondents refusing to share information. Permission to conduct the research was obtained from district, local authority and facility managers. The research was approved by the Ethics Committee of the Faculty of the Humanities, at the University of the Free State.

The quantitative and semi-quantitative data were entered and analysed in spreadsheets. The focus group discussions were translated, transcribed and data coded, and analysed thematically (Neuman, 2000). The inferences are general and, where appropriate, supported by direct quotations from respondents.

Results

Human resources

Table 1 shows the staffing profile of the 16 PHC facilities at baseline over the research period. The number of professional nurses employed at these facilities increased by 14%, from 147 to 167, and then remained largely unchanged at F2 (165). Of the total, 37 (one-fifth) were specifically allocated to work in the CCMT programme, a mean of 2.3 per clinic. By F2 each clinic was following up a mean of 260 patients on ART (range 60 - 804). If one excludes the professional nurses allocated to the ART programme, the remaining programmes of the clinics thus effectively lost a total of 19 nurses over the time period.

By F2, more than one-third (63) of all professional nurses (165) had attended the 1-week provincial ART training workshop. A

further 50 professional nurses had attended the ART training offered via iCAM (Interactive Distance Communication and Management System), which is a television broadcasting medium that allows the provincial Department of Health to disseminate information and communicate with health workers from a studio in the province's capital, Bloemfontein.

Although numbers did not change substantially over the period of observation, one of the significant changes over the time period was the greater involvement of and task-shifting to CHWs, especially lay counsellors in the ART programme. By F2 most of the drug readiness training had shifted from professional nurses to CHWs. This was made possible by extensive training of CHWs. At baseline, CHWs mostly functioned in single-purpose categories, specifically home-based carers, DOTS (TB) supporters or lay counsellors. Only 25% of the CHWs were trained in more than one area. At F1 this had increased to 75% and by F2, 87% of the CHWs were trained in more than one HIV/AIDS/TB-related activity.

Despite the increases in patient numbers and some internal mobility of staff towards the programme, as well as many other expressed frustrations, the professional nurses interviewed were overwhelmingly positive about the programme. As one explained: 'I'm really grateful that the people are getting all the help they can get, because prior to ARV there was no help for people, and these people are our own people. And as a nurse we are here because we want to heal a patient. So, if you do all you are supposed to do, and still the patient does not get well, ... you feel down, you get depressed. But now that ARV is here, these people are getting a chance ... a second chance to live ... I feel it is great that it is here.'

Space

One of the most frequently reported problems throughout the research was the lack of space, especially regarding available consultation rooms and waiting areas for the CCMT programme. In almost all facilities the programme was introduced as a physically separate service, requiring its own consultation,

Table 1. Trends in the total number of staff at the 16 sites (staff allocated to ART programme in brackets)

Staff	Baseline	F1	F2
Chief professional nurse	61	58 (2)	62 (3)
Senior professional nurse	25	46 (20)	53 (34)
Professional nurses	61	63 (18)	50
Total number of professional nurses	147	167 (40)	165 (37)
Data capturers	8 (8)	22 (22)	27 (27)
Community health workers (CHWs)*	231	260	238

*CHWs performed shared tasks across the facility.

counselling and treatment rooms, and even at times, waiting areas. This was seen by staff as benefiting patients, who wasted less time waiting in the general queues and were able to benefit from the interactions with others in the ART service, even if it meant the risk of compromising patient confidentiality. Staff were also able to carve out a space (including time) devoted to the complex tasks of setting up and managing the ART service. Indeed one of the primary criteria for the selection of these initial sites was that they already had sufficient space. However, despite renovations at many facilities, space remained problematic to accommodate the expansion of the programme and increasing number of patients.

Drugs and other supplies

Although drug supplies could be regarded as generally good at baseline, there was a further improvement in the availability of essential drugs over the period. At baseline only 4 of 10 key (non-ARV) drugs assessed were available at all 16 facilities; this number doubled by F2. ARV drugs were sent in sealed packages for individual patients to collect at the facilities, and observations of stock were thus not possible. Staff reported that this system was mostly reliable, although there were some instances of patients having to travel to the neighbouring treatment site to collect their monthly supply. At baseline, medical supplies, including sharps disposal containers, latex gloves and sputum bottles, were readily available. There was an increase in 9 of the 13 items of equipment observed between baseline and F2. Protocols and guidelines for the management of HIV and AIDS were less likely to be available in facilities than drugs and other supplies.

Laboratory support

The availability of the majority of observed laboratory tests remained unchanged over the period of study, with slight decreases (1 day) in the turnaround times of 3 of the 8 tests (Pap smear, sputum AFB, and CD4 count). The results of 5 of the 7 tests done off-site were available within 1 week. Table 3 lists the availability of laboratory tests offered and turnaround time at ART assessment sites.

Discussion

In the long term, public PHC facilities will bear the major responsibility for providing ART in South Africa. This study attempted to assess, in terms of available PHC resources and infrastructure, the preparedness and ability of PHC facilities to provide ART, as well as the impact of ART on PHC services. Staff shortages in PHC are problematic and unless appropriately managed, a large new public sector programme could undermine the rest of the health system (Barron, 2003; McCoy, 2005). The Free State Department of Health increased the number

of professional nurses employed at facilities where ART was implemented; approximately one-fifth were designated to the CCMT programme. While this was a positive step, a number of nurses shifted from other activities to the ART programme. Furthermore, although additional nurses received ART training, only designated ART nurses worked within the programme. A strategy that succeeded in slightly decreasing the workload of professional nurses related to the continued training and multi-skilling of CHWs. Regarding infrastructure, one of the most frequently reported problems was the lack of space allocated to the ART programme. Physical resources such as equipment, drugs and supplies in most instances were readily available at baseline, and improved marginally over time. Laboratory tests continued to be widely offered, with slight decreases in the turnaround times of some tests.

Possible limitations of the study were: (i) the 16 sites visited were the first facilities to provide ART and, therefore, received much attention, including the appointment of additional staff and purchasing of necessary equipment – facilities involved in future scale-up may not receive this degree of attention; (ii) a limited number of patients were on ART, and it may be expected that with increasing numbers of ART patients, additional constraints could be experienced by PHC service providers; (iii) the performance of the ART programme was not assessed in terms of outcomes; and (iv) the study was not conducted in non-ART-providing PHC facilities, which may have been weakened by the flow of staff to facilities providing ART.

Evidence indicates that, thus far, PHC facilities have been able to cope with the CCMT programme and that the implementation of the programme has had a number of positive impacts. However, attention should be paid to: (i) reviewing the nature of tasks performed in PHC services, and identifying further possibilities for task-shifting from professional nurses to other categories; (ii) integrating ART provision with other PHC services; (iii) providing better support to PHC facilities and providers, as more and more aspects of the CCMT programme are decentralised to PHC level; and, (iv) addressing the shortfall in the supply of human resources more generally.

Ultimately, it should be accepted that a major service such as the CCMT programme requires new thinking on PHC infrastructure such as facility size and design, as well as appropriate numbers and mix of staff (e.g. pharmacist assistants, community health workers, administration clerks and data capturers) routinely available in the PHC system. These investments could be the leading edge for better management of all chronic diseases, whether TB, HIV or the emerging problem of non-communicable chronic diseases of lifestyle.

Table 2. Facilities with available drugs, equipment and supplies for comprehensive HIV and AIDS treatment and care (including for STIs, TB and family planning) (N=16)*

	Baseline	F1	F2
Drugs			
Co-trimoxazole syrup	16	15	15
Co-trimoxazole tablets	12	13	16
Ciprofloxacin tablets	14	16	16
Flagyl tablets	14	16	16
Erythromycin	15	13	16
Doxycycline	16	16	16
RHZE (Rifafour)	16	16	16
INH (Isoniazid)	15	14	13
Injectable contraceptives	14	15	16
Medical supplies			
Condoms/waiting area	16	14	16
Sharps disposal containers	16	16	16
Latex gloves	16	15	16
Rapid HIV/AIDS testing kits	15	14	15
Plastic bags for specimen containers	15	16	16
Sputum jars	16	16	16
Protocols and guidelines			
Information manual for management of children with HIV/AIDS	11	14	11
Protocol for HIV rapid test quality assurance	11	6	7
HIV strategic plan for South Africa/the district 2000-2005	6	5	3
PMTCT guidelines	13	15	11
Guidelines and/or recommendations for feeding infants of HIV+ mothers	13	15	12
Management of occupational exposure to HIV	12	14	12
Essential Drug List	15	15	16
Equipment (number of functioning items)			
Adult scales	66	76	85
Infant scales	63	65	53
Screened examination couches	124	165	177
Examination lights	73	67	91
Stethoscopes	119	112	145
Blood pressure meters	131	149	159
Glucometers	45	45	44
Computers	36	54	69
Oxygen cylinder with O ₂	68	44	46
Fax machines	3	5	6
Refrigerators	47	49	60
Television and video recorder sets	8	10	5
Health education videos	35	47	65

*ART drugs were not assessed as they are pre-packed at a central pharmacy and should only be opened by the patient for whom they are meant.

Table 3. Availability of laboratory tests offered and turnaround times at ART assessment sites (N=16)

Tests	Baseline		F1		F2	
	Test offered	Turnaround time	Test offered	Turnaround time	Test offered	Turnaround time
Urine pregnancy	15	OS*	15	OS	15	OS
Rapid HIV	15	OS	16	OS	15	OS
Syphilis	16	3	16	3	16	3
Pap smear	16	10	16	9	16	8
Sputum AFB	16	4	16	4	16	3
CD4 count	†	†	16	5	16	4
Viral load	†	†	11	5	10	5
HIV DNA PCR	†	†	7	4	5	5

*OS: Test done on site.

† This information was not captured at baseline, as these tests were not requested by assessment sites yet.

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