Antiretroviral treatment and the health workforce in South Africa: how have ART workers been affected by scaling up?

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Summary

OBJECTIVE To investigate the effect of scaling up antiretroviral treatment (ART) on the working environment and motivation of health workers in South Africa; and to suggest strategies to minimize negative effects and maximise positive effects.
METHODS Exploratory interviews with health managers and senior clinical staff were used to identify locally relevant work environment indicators. A self -reported Likert scale questionnaire was administered to a randomly selected cohort of 269 health professionals at health facilities in KwaZulu Natal and Western Cape provinces of South Africa that included ART delivery sites. The cohort was disaggregated into ART and non-ART groups and differences between the two compared with Fisher's exact test and the non-parametric Mann–Whitney *U*-test.
RESULTS The ART sub-cohort reported: (i) a lighter workload ($P = 0.013$), (ii) higher level of staffing ($P = 0.010$), (iii) lower sickness absence ($P = 0.032$), (iv) higher overall job satisfaction ($P = 0.010$), (v) poorer physical state of their work premises ($P = 0.003$), and (vi) higher staff turnover ($P = 0.036$).
CONCLUSION Scale-up affects the work environment in ways that influence workers' motivation both positively and negatively. A net negative balance is likely to drive staff out-migration, undermine the quality of care and compromise the capacity of the programme to achieve significant scale. As health workers are the most important element of the health system, a comprehensive and systematic understanding of scale-up impacts on their working conditions and motivation needs to be an integral part of any delivery strategy.

keywords HIV/AIDS, antiretroviral therapy, health workforce, health system, South Africa

Introduction

The '3 by 5' initiative launched by the United Nations Joint programme on HIV/AIDS (UNAIDS) and the World Health Organisation (WHO) in 2003 aimed at rapid scale up of antiretroviral treatment (ART) to provide access to antiretroviral drugs for three million people with HIV/AIDS in low and middle-income countries by the end of 2005 (WHO & UNAIDS 2003). The initiative has been ambitious and groundbreaking and has generated wide ranging debate on the relationship between ART scale- up and broader health systems in resource-limited settings (McCoy 2005; McCoy *et al.* 2005).

The labour-intensive nature of ART delivery (Kober & Van Damme 2006; Van Damme *et al.* 2007) set against health workforce shortages in developing countries (WHO 2006), has made human capital an issue of particular focus within the debate. Human resources play a central role in health system performance, quality of care and scaling up health interventions. With more funding available for ART, capacities of health systems and shortages of workers have replaced funding shortfalls as the most serious threats to achieving universal ART coverage (Hongoro & McPake 2003; Liese *et al.* 2003; Loewenson & McCoy 2004). But the relationship between health systems and ART expansion is neither linear nor unidirectional. Hence, while it is generally agreed that rapid scale-up of ART itself is likely to impact on structures and capacities of health systems in developing countries, the pathways through which impacts occur have been neither precisely defined nor empirically explored.

Some projections made at conceptual level suggest that ART scale-up can lead to a diversion of attention, resources and personnel from other essential health services (McCoy *et al.* 2005). Limited human resources coupled with stressful working environments can result in overwork and burnout (Malangu 2006). But others argue that ART scale-up is an opportunity to build strong and effective health systems, and in particular, the human resource capacity in the public sector (Okera *et al.* 2003; McCoy *et al.* 2005).

In this paper we report the findings of a health worker survey in South Africa, which is part of a multimethod investigation of the impact of ART scale-up on health systems in sub-Saharan Africa. We examined a number of health workforce indicators in cohorts of ART and non-ART workers to explore the impact of scaling up on providers' physical environment, workload, level of stress, remuneration and job satisfaction. The findings have important policy implications and can contribute to a better understanding of how ART scale-up can be achieved in a sustainable way, minimising possible negative effects and maximising opportunities for strengthening health systems.

Methods

Study context

South Africa has the largest number of HIV infections in the world (UNAIDS 2006) with the most recent prevalence estimates suggesting a median level of 29% among the adult population (Department of Health 2007). Among the country's nine provinces, HIV prevalence is highest in KwaZulu Natal (39%) and lowest in Western Cape (15%).

A national strategy to scale-up ART services was adopted in 2003 (Department of Health 2003) and within the first 2 years the number of people accessing treatment rose ten-fold. By the end of 2005 25.2% of the eligible population were estimated to be covered by the public ART services (Natrass 2007).

Our study took place at two treatment access sites, *Ilembe district* in KwaZulu Natal (50 km from Durban) and the *Cape Winelands region* in Western Cape (70 km from Cape Town). The sites were purposively selected to reflect the heterogeneity of HIV prevalence, ART coverage, programme design, health system characteristics and socio-economic environments that may impact on ART delivery in South Africa (Table 1). In general, KwaZulu Natal represents a primarily government-driven, early phase ART programme, while Western Cape features a more advanced and decentralised model delivered by a mix of governmental, non-governmental and private sector providers (Médecins sans Frontières South Africa *et al.* 2003).

Study design and participants

We identified eight facilities (four in each province) providing both HIV/AIDS (including ART) and other healthcare services. The sample consisted of a cohort of health workers randomly drawn from each facility, who were then separated into ART and non-ART groups. In this study we defined ART workers as health professionals

Table 1 Profile of study sites

Indicator	Ilembe District	Cape Winelands Region
Province	KwaZulu Natal	Western Cape
Population	562 700	500 000
Provincial HIV prevalence (2005)	39.1% (C.I. 36.8–41.4)	15.7% (C.I. 11.3–20.1) HIV infection ranges from 5.8% to 17.8%. There has been an observed increase in infection since 2000 with Paarl going from 4.5% to 10.1% in 2003. Stellenbosch has the highest prevalence of 17.8%
Antiretroviral treatment roll out	Started September 2005	Started February 2004. However, there have been partnership projects with academic institutions and non-governmental organisations such as Médecins Sans Frontières since April 2001
Antiretroviral treatment coverage	20% (lowest nationally)	55% (highest nationally)
Delivery model	Public sector-driven, hospital-based, physician-led	Public – private partnerships with significant NGO presence, primary care-based
Description of treatment site	Stanger hospital is the regional hospital and main facility with step down clinics in Sundumbili, Kwadukuza and Maphumulo hospitals	Primary care clinics in Malmesbury, Stellenbosch, WC hospice, TC Newman and Paarl districts
Health system capacity	Relatively fragile and sensitive to changes in level of resourcing	Relatively strong and resilient

whose primary deployment was to ART clinics to provide ART-related services. The comparator group were staff working in other clinical areas including non-drug aspects of HIV/AIDS care. The treatment access sites had a total of 1229 personnel comprising 200 in Western Cape (including an estimated 70 volunteers) and 1029 in KZN (178 night staff in Stanger and Maphumulo hospitals were not included in our sampling frame). We obtained staff strength figures from the facilities' websites, human resources departments, and (in the case of TC Newman and Sundumbili clinic) best estimates by the chief nurse. Treatment access sites consisted of either a main hospital-based centre linked to feeder clinics (KwaZulu Natal) or individual primary care clinics (Western Cape). The study design allowed for over-sampling of ART workers to enable sufficient numbers for statistical analysis.

Hypotheses and research instrument

Our initial hypotheses were based on the academic literature and policy reports on ART scale-up in developing countries. We hypothesised that an influx of substantial financial resources into a single health area coupled with unprecedented political and international pressures surrounding ART scale-up, would affect human resource capacity throughout health services. Given the early stage of the '3 by 5' implementation and the scarcity of information sources based on empirical data, we could not be more specific on either the indicators that may be affected or direction of the effect (positive or negative).

To isolate the key areas of focus we conducted a small-scale pre-study, which involved in-depth interviews with health managers and senior clinical staff in the selected facilities. We explored general perceptions of ART scale-up, how it was operationalised in their clinics, and its impact on health workers. The thematic analysis contributed to the development of a research instrument and a set of indicators to measure internal (intrinsic) and external (extrinsic) work-related factors. The former group included: (i) working hours, (ii) workload, (iii) complexity, (iv) state of physical premises, (v) availability and quality of equipment, and (vi) job satisfaction. The extrinsic factors were: (i) remuneration and financial incentives, (ii) job training opportunities, (iii) adequacy of staffing, (iv) work-related stress, (v) staff absenteeism, and (vi) staff turnover. A 54-item self-completed questionnaire asked respondents to rate their work environment and staffing issues on a 5-point Likert scale (Likert 1932; De Vellis 1991). The instrument was designed to measure both the current conditions and changes over the past 12 months. The questionnaire was piloted prior to the main study which took place between January and April 2006.

The study was approved by the Biomedical Research Ethics Committee of the University of KwaZulu Natal; and administrative permission granted by the local authorities in both provinces. Informed consent was obtained from all participants.

Data analysis

The data were analysed with SPSS 10.1 for Windows (SPSS, Inc., Chicago, IL, USA). We examined social and demographic characteristics of the two sub-cohorts using Fisher's exact test; and applied the non-parametric Mann–Whitney *U*-test to compare the distribution of responses between the groups The responses were presented in three categories to show the direction (i.e. positive or negative) but not the intensity (i.e. greatly/slightly) of response. Statistical significance was determined at the 5% level and the two-tailed test was calculated in all instances to allow for the assumption that impacts could manifest in either direction. *P*-values were computed by asymptotic testing as the sample size was relatively large (Siegel & Castellan 1988). Minor discrepancies in percentages in the tables were due to rounding.

Results

Participant characteristics

A total of 269 health professionals completed the questionnaire with 167 (62.1%) from KwaZulu Natal (Table 2). The median age was 36.4 years; and most respondents were women (83.5%) and Christians (83.1%). Almost seven in 10 had been educated to vocational or university level. The professional groupings comprised of doctors/dentists (9.2%), nurses/midwives (44.4%), technical/clinical support staff (19.6%) and others – administrative, records and clerical staff (26.8%). ART workers made up 44.6% of the total (120/269) and did not differ significantly from other health workers in their socio-demographic characteristics.

Work environment at present

Table 3 shows that across both groups, a majority of respondents considered their work to involve long hours, a heavy workload and a high level of complexity. However, those who did not provide ART services were more likely to perceive their workload as heavy ($P = 0.013$) and were less satisfied with their job ($P = 0.010$). ART workers were more likely to regard the physical condition of their work premises as poor ($P = 0.003$), but no difference in satisfaction with the availability and quality of work equipment was found.

Table 2 Socio-demographic profile of health workers

Variable	*n* (%)	Health service area ART (%)	Health service area Non-ART* (%)	*P*-value†
Age (years)				0.160
≤30	74 (27.8)	32 (26.9)	42 (28.6)	
30–39	85 (31.9)	45 (37.8)	40 (27.2)	
40–49	57 (21.4)	24 (20.2)	33 (22.4)	
≥50	50 (18.9)	18 (15.1)	32 (21.8)	
Median	36.3	35.5	37.1	
Mean	38.3	37.5	39.2	
Sex				0.505
Male	43 (16.5)	17 (14.7)	26 (18.1)	
Female	217 (83.5)	99 (85.3)	118 (81.9)	
Religion				0.773
Christian	222 (83.1)	98 (82.3)	124 (83.8)	
Muslim	3 (1.1)	2 (1.7)	1 (0.7)	
Traditional African	8 (3.0)	5 (4.2)	3 (2.0)	
Other/none	34 (12.8)	14 (11.8)	20 (13.5)	
Education				0.336
None/primary school	5 (2.0)	3 (2.7)	2 (1.4)	
Secondary school	74 (29.5)	30 (27.3)	44 (31.2)	
Technical/vocational	110 (43.8)	50 (45.5)	60 (42.6)	
University	62 (24.7)	27 (24.5)	35 (24.8)	
Professional type				0.138
Doctor/dentist	23 (9.2)	6 (5.4)	17 (12.2)	
Nurse/midwife	30 (12.0)	11 (9.9)	19 (13.7)	
Technical/clinical support*	130 (52.0)	59 (53.1)	71 (51.1)	
Admin/clerical /others	67 (26.8)	35 (31.5)	32 (23.0)	
Province				
Kwazulu Natal	167 (62.1)	75 (62.5)	92 (61.7)	
Western Cape	102 (37.9)	45 (37.5)	57 (38.3)	

*Medical assistants, auxiliary nurses, laboratory and pharmacy technicians.
†Fishers exact test.

We did not identify any differences in relation to work remuneration, opportunities for training or levels of work-related stress (Table 4). Opinions about the level of staffing were fairly evenly divided among ART workers with about a third each considering it high, average or low, while non-ART professionals tended to regard it as average ($P = 0.010$). ART workers were more likely to report a lower rate of sickness absence from work ($P = 0.032$) but a significantly higher rate of staff turnover ($P = 0.036$).

Comparison with other health workers

We also asked the respondents to rate their work environment as compared with other colleagues. Here, the ART group were more likely to consider their work as being of higher complexity ($P = 0.002$) but offering greater opportunities for work-based training ($P = 0.001$; data not shown but available from the authors). In all other aspects of work, comparisons were similar.

Changes in the past 12 months

In response to the questions about changes in the work conditions, no significant differences were found between the groups on any indicator except job satisfaction. A comparatively greater proportion of ART staff reported an increased job satisfaction in the past 12 months, while significantly more non-ART workers said their level of satisfaction had reduced ($P = 0.020$; data not shown).

Discussion

There is global recognition that human resources have a major influence on the performance of health systems (WHO 2006). The provision of ART is not an exception (WHO 2004; Kober & Van Damme 2006). ART delivery is a highly labour-intensive undertaking (Kober & Van Damme 2006; Van Damme *et al.* 2007) whose success is closely linked to both the numbers of workers available (WHO 2006) and their motivation to work (Franco *et al.*

Table 3 Intrinsic work environment characteristics

Indicator	Health service area: ART (%)	Non-ART (%)	*P*-value*
Hours worked per week			0.066
≥40	90 (83.3)	130 (90.9)	
20–39	12 (11.1)	10 (7.0)	
≤20	6 (5.6)	3 (2.1)	
Satisfaction with work hours			0.095
High	82 (73.2)	85 (61.6)	
Average	14 (12.5)	32 (23.2)	
Low	16 (14.3)	21 (15.2)	
Workload			0.013
Heavy	80 (71.4)	116 (84.1)	
Average	29 (25.9)	22 (15.9)	
Light	3 (2.7)	0 (0.0)	
Work complexity			0.185
High	82 (75.2)	88 (66.7)	
Average	26 (23.9)	42 (31.8)	
Low	1 (0.9)	2 (1.5)	
State of physical premises			0.003
Good	38 (33.6)	64 (47.8)	
Average	25 (22.1)	37 (27.6)	
Poor	50 (44.2)	33 (24.6)	
Equipment availability/quality			0.431
Good	38 (34.9)	48 (36.9)	
Average	33 (30.3)	45 (34.6)	
Poor	38 (34.9)	37 (28.5)	
Overall job satisfaction			0.010
High	47 (42.7)	46 (33.6)	
Average	56 (50.9)	61 (44.5)	
Low	7 (6.4)	30 (21.9)	

*Mann–Whitney *U*-test

Table 4 Extrinsic work environment characteristics

Indicator	Health service area: ART (%)	Non-ART (%)	*P*-value*
Remuneration			0.057
Good	32 (30.2)	30 (22.7)	
Average	33 (31.1)	45 (34.1)	
Poor	41 (38.7)	57 (43.2)	
Job training			0.288
Satisfactory	85 (75.9)	97 (69.3)	
Average	10 (8.9)	16 (11.4)	
Unsatisfactory	17 (15.2)	27 (19.3)	
Staffing levels			0.010
High	31 (31.3)	15 (12.2)	
Average	33 (33.3)	53 (43.1)	
Low	35 (35.4)	55 (14.7)	
Work stress			0.701
High	58 (51.3)	78 (54.9)	
Average	45 (39.8)	51 (35.9)	
Low	10 (8.8)	13 (9.2)	
Staff sickness/absenteeism			0.032
High	24 (23.1)	39 (30.7)	
Average	31 (29.8)	47 (37.0)	
Low	49 (47.1)	41 (32.3)	
Staff turnover			0.036
High	34 (35.1)	24 (20.5)	
Average	43 (44.3)	62 (53.0)	
Low	20 (20.6)	31 (26.5)	

*Mann–Whitney *U*-test.

2002; Hirschhorn *et al.* 2006). Yet, although linkages between ART scale-up and health systems have been recognised (Attawell & Mundy 2003; McCoy 2005; McCoy *et al.* 2005), little empirical evidence is available to assess how rapidly increasing ART demand has affected health workforce, who even without this new change appeared to be overstretched and overwhelmed (Kolyada 2004). While the WHO has done important work to estimate health workforce needs for different models of ART provision in resource-limited settings (Hirschhorn *et al.* 2006), WHO 2006), we have looked at how the first phase of ART scale-up is affected by factors that impact not so much on numbers of workers but on their motivation and possibly productivity.

Staff motivation is complex and influenced by multiple factors (Franco *et al.* 2002). Our study was thus informed by preliminary exploratory work that identified issues relevant to the working environment of the study setting (Fischer & Muller 2000; Hall 2004; King & McInerney 2006; Kotzee & Couper 2006; Lephoko *et al.* 2006; Mathauer & Imhoff 2006). We identified the following characteristics that distinguished ART workers from the rest of the health workforce: (i) perception of higher level of staffing, (ii) lighter workload, (iii) poorer physical state of the work premises, (iv) higher job satisfaction, (v) lower sickness absence and (vi) higher staff turnover.

Contrary to major concerns of scale- up planners (Kober & Van Damme 2006), we did not find evidence to suggest that delivering ART had imposed an additional burden on health workers. This is contradictory given that HIV/AIDS itself increases the workload, especially for nurses (Hall 2004). It may be that ART services are better staffed because of the high profile of HIV/AIDS in the policy arena and pressure to meet set targets, or because of the position of South Africa which at the time of the study had relatively lower ART coverage (Natrass 2006) and less staff shortages (Kober & Van Damme 2006) than neighbouring states. At the same time, ART programmes could potentially ease the load on health care by removing the sickest patients (many of whom would be HIV positive and receiving drug treatment) and reducing their subsequent demand on general services (as they would be less ill).

An alternative explanation could lie in the higher levels of job satisfaction among ART staff. Comments by interviewed key informants suggested that being able to make available life-prolonging drugs to people in greatest need, witnessing first-hand the health transforming effects of ART and perceiving oneself as an integral part of an important global process boosted the morale of health personnel, some of whom are HIV positive themselves. This in turn, could be reflected in more positive disposition to working conditions. This view is consistent with findings in the Free State province of South Africa which highlighted the hope provided by ART roll out and its motivating effect on nurses (Stein *et al.* 2007). Furthermore, a number of the ART staff were volunteers who would normally be expected to have a higher level of motivation.

Another seeming contradiction was that in one instance ART gave similar responses about training opportunities as non-ART staff, but in another instance they reported getting more opportunities for work based training than their non-ART colleagues. The context of their response was that the former was made on the basis of a notional expectation of personal development for health professionals generally while in the latter ART staff specifically compared their opportunities with those of non-ART staff. Being a relatively new programme, more ART work-based training would have taken place over the last year than in other health service areas. Importantly too, over the last year more ART staff reported an increase in job satisfaction while more non-ART staff reported a decrease. Therefore when asked to compared against other service areas, ART staff perceived their training opportunities in a more positive light.

Two of the most influential work motivators, remuneration (Wiley 1997) and physical environment (Herzberg *et al.* 1959) were not found to be important in this study. The finding may be confounded by the fact that those workers for whom these material aspects were an issue may have moved to more lucrative sectors. This may explain our finding of high staff turnover within ART services despite a high level of job satisfaction. A possible explanation may lie in the structure of ART provision in South Africa, which is highly fragmented with both public and private providers involved in delivering services. It is likely that once workers gain skills and experience in the government facilities, they are attracted to positions in the independent sector, which are usually better paid and located in areas with a higher standard of living. More work to explore this issue in greater detail is necessary.

Our study had a number of limitations. The response rate was lower than anticipated, particularly at some of the busier sites, which introduced a selection bias. Doctors were particularly difficult to follow up, as they moved between the clinics. We sought to minimise this by remaining on site for longer periods and undertaking no work on the busiest days of the week (Mondays and Fridays). Further, although we clearly defined criteria for dividing participants between the ART and non-ART sub-cohorts, some respondents worked in both ART and non-ART services, which was a confounding factor affecting the results. The study conclusions are based on the two provinces only and therefore only allow generalisation to areas of the country with similar systems. The study conclusions are based on the two provinces only and therefore only allow generalisation to areas of the country with similar systems. ART delivery in South Africa is pluralistic – a different approach is seen in the Free State province which has the fourth highest prevalence of HIV infection in the country and a health system characterised by a lack of skilled health workers, particularly doctors. The ART programme is primarily nurse-led and more closely integrated with the health care system (Stein *et al.* 2007).

The findings have important policy implications. First, there is a clear need for a comprehensive and systematic understanding of the impacts of ART expansion on health personnel's working conditions and motivation. It needs to be an integral part of any scale up strategy at national or international levels, particularly because the impacts are likely to change as scale-up progresses. Second, while the workload and levels of stress of ART personnel may be comparatively favourable at present, further increase in patient coverage is likely to lead to an imbalance and undermine the quality of care. Strategies to increase personnel recruitment and retention rates accordingly need to be put in place. Finally, high staff turnover needs to be given serious attention; it can pose a significant barrier to ART provision in the stages when the programme achieves substantial scale. In the context of fragmented services with multiple providers, poor remuneration and working conditions can result in draining skilled workers from the public sector, which can lead to further disintegration of services and weakening of the public health system.

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