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Barriers to the Implementation of the HIV Universal Test and Treat Strategy in Selected Primary Care Facilities in South Africa's Eastern Cape Province

Onke R. Mnyaka[1], Sikhumbuzo A. Mabunda[2], Wezile W. Chitha[1], Sibusiso C. Nomatshila[3], and Xolelwa Ntlongweni[4]

Abstract

Background: The South African government implemented the Universal Test and Treat (UTT) approach to treating HIV in the second half of 2016. As part of a contribution to the successful implementation of UTT, this study looked at barriers to implementation of UTT emanating from weaknesses of the health system in 2 Community Health Centers in South Africa's Eastern Cape Province. **Methods:** This was a quantitative cross-sectional design which had both descriptive and analytical components. Convenience sampling was used to select and recruit 2 primary care facilities and 30 nurses. Self-administered questionnaires were used to solicit data from facility managers and nurses. In addition, a record review was used to access 6 months' data for the period 1 October 2017 to 31 March 2018. Data were analyzed using Stata 14.1. Categorical data were presented using frequency and contingency tables. The 95% confidence interval (95% CI) is used for the precision of estimates and the *P*-value of statistical significance is $P < .05$. **Results:** Facilities were found to have poor leadership and governance; human resource challenges that include shortages, lack of skills and lack of developmental support; poorly resourced service delivery platforms and poor information management. Of the three 90-90-90 targets, health facilities only satisfactorily achieved the second 90 of initiating all who test positive for HIV within a week (93.1% or n = 288/307). **Conclusions:** This study has been able to identify potential barriers to the implementation of the UTT strategy at the selected facilities including the lack of structured programs in place to monitor performance of healthcare staff, knowledge gaps, and a lack of good clinical governance practices as evidenced by the lack of customized protocols and Standard Operating Procedures.

Keywords

HIV, HAART, ARV, ART, Universal Test and Treat, primary care, South Africa

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Introduction

The HIV epidemic continues to be a public health problem globally, with 38 million people estimated to be living with HIV worldwide in 2019.[1,2] Of all the 38 million people living with HIV, 26 million were receiving antiretroviral treatment by the end of June 2020.[1,2] The world has been battling with this epidemic for almost 4 decades, sub-Saharan Africa being the most affected region with 46% of the world's HIV burden.[1-3] In South Africa, the HIV prevalence has remained steady during the past decade, contributing approximately 19% of the total burden of HIV globally in 2015.[1-3] Currently the HIV prevalence rate is estimated at 20.4% in South Africa.[1-3]

A number of African countries have been responding robustly to the HIV epidemic; Botswana, Eritrea, Kenya, Malawi, Mozambique, Rwanda, South Africa, Swaziland, Uganda, the United Republic of Tanzania, Zambia, and

[1]University of the Witwatersrand, Johannesburg, South Africa
[2]University of New South Wales, Sydney, NSW, Australia
[3]Walter Sisulu University, Mthatha, South Africa
[4]Walter Sisulu University, Butterworth, South Africa

Corresponding Author:
Onke R. Mnyaka, Health Systems Enablement and Innovation Unit, University of the Witwatersrand, Queens Office Park, Building 1FF, Alexandra Road, Irene, Centurion 0157, Johannesburg 2050, South Africa.
Email: omnyaka@hsei.co.za

Zimbabwe are among countries which increased treatment coverage by more than 25% between 2010 and 2015.[4] South Africa has the largest ARV program in the world, which can be attributed to significant strides the South African government has made in combating HIV/AIDS in the post-2004 era, where trends in ARV roll-out have improved significantly.[5] For example, between 2010 and 2014 ARV coverage increased from approximately 15% to more than 40%.[5] However, when comparing South Africa to other African countries there is evidence to suggest that the country can still improve.[5] For instance, in terms of AIDS related deaths, South Africa recorded a 48% decline while Zimbabwe and Rwanda recorded a 57% and a 76% decline respectively.[6]

The Universal Test and Treat (UTT) strategy was introduced after the World Health Organization (WHO) published new guidelines on the use of ARVs for the prevention and early treatment of HIV infection in 2015.[5,7] According to the new guidelines, CD4 cell counts are no longer used as the basis for ARV initiation.[7] This means that everyone who is infected with HIV is eligible for ARVs and should be provided with treatment regardless of their CD4 cell count.[7]

Removing CD4 staging and all ARV prioritization enhances the global response to HIV.[8] Furthermore, "initiating more patients on ARVs and eliminating the costs of ARV staging would create an environment conducive for HIV care decentralization and scale-up that will put the world on track to reach the 90-90-90 targets."[8]

The UTT strategy is aimed at reducing the HIV incidence and transmissibility of the HIV virus by suppressing the viral load.[5] Successful implementation of this strategy, at least, in the next 20 years will result in the elimination of HIV as a public health problem.[9] For example, by the end of 2017 global ARV coverage was estimated at 59% compared to 46% in 2015.[10] This is a positive feedback showing that the world is on the right track for ARV scale-up.[7,11] The African region had the greatest gains, particularly the Eastern and Southern regions of Africa with coverage increasing from 24% in 2010 to 54% in 2015, reaching a regional total of 10.3 million people.[12]

South Africa is one of the countries that have implemented the UTT strategy.[7] This is informed by the WHO evidence based guidelines aimed at supporting realization of the 90-90-90 targets by 2020.[12] In South Africa, the aim of the UTT strategy is to reduce the incidence of HIV infection through the provision of expanded prevention and treatment options.[9] Successful implementation of UTT will result in the reduction of HIV incidence and HIV related morbidity and mortality in the country.[7] On the other hand, there are people who feel that UTT implementation may take away some valued practices that encourage people to start on ARVs, such as CD4 count staging.[4] Long patient waiting times, getting HIV infected people to the healthcare system and initiating them on ARVs are some of the potential barriers to the success of UTT in South Africa.[13,14] These challenges provide a perfect opportunity for research to be conducted, to contribute to the growing body of knowledge on the implementation of UTT in South Africa and elsewhere.

The Eastern Cape province of South Africa has one of the highest burdens of HIV in South Africa.[15] For example, in 2012 HIV was among the leading causes of death in the Eastern Cape (EC) accounting for approximately 5.4% of all deaths.[16] Eastern Cape is currently one of the provinces with high HIV prevalence rate with 13.04%.[17] In 2020, Mabunda et al reported an HIV antenatal prevalence of 38.2% in 4 health facilities of the same districts. Further confirming the association of HIV with gender and a low socio-economic status. Furthermore, the EC province has seen the highest rise in HIV prevalence in the country.[18] This may be a consequence of limited resources, lack of standardized training, and competing clinical care priorities.[19] This may pose a threat to the implementation of UTT strategy in the province. This study sought to identify health system-based barriers to UTT implementation at selected primary care facilities in the Eastern Cape. This also entailed understanding more about the clinical staff who are responsible for the implementation of this strategy. The identification of these barriers will provide an opportunity to address them. This research further sought to provide an opportunity for mitigation strategies to be implemented.

Methods

Study Design

A quantitative cross-sectional design with both descriptive and analytical components was employed in this study. This study design was chosen because it provided the least costly way of answering the research question in a snapshot view. It also did not have the risk of loss-to-follow-up whilst describing the situation in the primary care facilities.

Population and Setting

The study was conducted in 2 sub-districts: Ngcobo sub-district which is in the Chris Hani district and King Sabata Dalindyebo (KSD) sub-district which is in the OR Tambo district. Both these districts are in the Eastern Cape Province. The sub-districts were selected due to convenience and funding requirements. Facility managers, nurses, and doctors in all Community Health Centers (CHCs) in the 2 sub-districts were recruited for the study. CHCs were chosen since they have a broader package of care than clinics.

Sampling

Convenience sampling was used to select 1 CHC in each sub-district. Convenience sampling was employed in order to adhere to the requirements of the funder. The funder required the study to be inclusive of Ngcobo sub-district. The 1 facility in the KSD sub-district was selected as a control due to its geographical proximity to Ngcobo sub-district.

All facility managers and all available clinical staff were conveniently recruited to participate in the study. Due to the small number of health workers at these health facilities, the intention was to enroll all of them. After attainment of official approvals for the study, meetings were held with the facilities' management explaining the study and the recruitment process. Fliers with the principal researcher's contact details were posted at official notice boards. Potential participants were further directed to the presence of these fliers during daily staff meetings.

Data Collection

Two English standardized and validated self-administered questionnaires were used to collect information from facility managers and clinical staff. The survey tool for facility managers had 30 questions developed through literature review and whose content validity was reviewed by 2 experts. The questionnaire asked about the staff profile, human resource development, HIV management protocols, facility utilization, laboratory logistics, and pharmaceuticals. The questionnaire on clinical staff followed the same validation process as above and had 79 questions which asked questions pertaining to demographic characteristics, practices, attitudes, HIV management, knowledge, and perceived barriers to UTT. For additional data on the 90-90-90 indicators, a record review for a 6-month period (October 2017 to March 2018) was also undertaken and added to the questionnaire for facility managers. The third instrument was a review which collected the following information: total head count; number of HIV tests; number of HIV positive results; number of HIV positive patients initiated on ARVs; number of HIV viral loads collected; number of HIV positive patients initiated with suppressed viral loads; number of HIV positive patients; number of HIV positive patients initiated on ARVs.

The Principal Investigator was responsible for the distribution of questionnaires and was present to clarify questions that needed a response. The survey was taken in a specifically assigned area of the health facilities. This allowed for privacy between the researcher and the participants. Repeated visits were undertaken by the principal researcher to each health facility to ensure that all staff members including those who work on night shifts and weekends had a chance to participate in the study to minimize selection bias. Information bias was further reduced through the triangulation of information sources. Personal identifiers were not recorded on the survey tool or consent form.

Pilot Study

To inform this work, a pilot study was conducted at Ngangelizwe CHC, to test and ensure the effectiveness of all data collection tools. Once the pilot study was done, necessary adjustments to the data collection tools were made to ensure that all questions enhanced the validity and reliability of the study findings.

Data Analysis

Data were captured and coded in Microsoft excel 2013 (Microsoft corporation, Seattle, USA) and then exported to Stata 14.1 for analysis (STATA Corp LP, College Station, Texas, USA). Open ended questions with a categorical response were categorized according to common themes. Open ended responses of health facility managers and clinical staff were categorized as part of post hoc analysis.

Knowledge scores of clinical staff were assessed out of 100 and a knowledge score of 75% or more was considered to be good, based on the 75th percentile. The distribution of numerical variables was explored using the Shapiro Wilk test. Numerical data that were not normally distributed were analyzed using the median and Interquartile Range (IQR). The Wilcoxon Sum rank test (Mann-Whitney test) and the Kruskal Wallis tests were used to compare the differences of medians between 2 or more than 2 categories respectively.

Categorical variables are presented using frequency tables, percentages and graphs. Two or more categorical variables are compared using contingency tables and the expected frequencies were calculated to determine the type of test to use for the purpose of determining the extent of the relative associations. As the expected frequencies were ≥ 5 the Chi-squared test (Chi^2) was used to compare 2 categories. The Prevalence Ratio (PR) is the relative measure of association used. The 95% Confidence Interval (95% CI) was used to estimate the precision of estimates. The level of significance was set at 5% (P-value $\leq .05$) for statistical significance.

Results

Leadership and Governance

Each of the facilities had more than 10 years' experience of managing HIV. Both facilities had permanently appointed facility managers who are in their 50s as shown in (Table 1).

Table 1. Profile of Facility Managers of 2 Facilities.

Characteristics	CHC-1	CHC-2
Age, years	57	50
Years practising as a nurse	27	22
Years working at this facility	3.33	18
Management experience, years	8	11
Duration as a manager at this facility, years	1	3
Facility's experience in managing HIV, years	>10	>10

Between the 2 of them, they had 49 years of nursing experience. Compared to CHC-2 manager who had worked there for 18 years, the CHC-1 manager had only worked there for 40 months. The CHC-1 manager had 8 years of management experience, 1 of which was the position she held at the time of the study. The CHC-2 manager had 11 years of management experience, 3 of which were in her position at the time of the study.

According to facility managers, both facilities did not have Standard Operating Procedures (SOPs) and customized protocols for managing HIV in their respective facilities but instead relied entirely on the national guidelines. Staff participants were asked if these guidelines were always available for reference by staff in accessible areas of the facility (Table 4). The majority (n=25 or 83.3%) responded that the guidelines were accessible whilst the rest (n=5 or 16.7%) did not know. When asked how often they referred to guidelines, participants were split between those who said regularly (n=19 or 63.3%), rarely (n=7 or 23.3%), and those who either said never or did not know (n=2 or 6.7%).

Managers were asked how they identified skills and developmental needs of their staff. The CHC-1 manager reported that they carried out a random clinical record audit which allowed them to note those who did not manage correctly. As one of the managers reported, "We don't have a formal way of knowing what a staff member needs or is lacking on a certain area. We just do informal observations on how people manage patients and when there are complaints from patients."

Health Workforce

As can be seen in Figure 1, there were 36 and 25 health professionals at CHC-1 and CHC-2 respectively. CHC-1 did not have a medical doctor or pharmacist. Except for Enrolled Nurses where both facilities had 2, CHC-1 had more of each staff category than CHC-2.

Due to low numbers of staff in other categories, only nurses were available for participation in this study. A total of 30 participants were recruited which makes up 49.2% of the staff complement of both facilities combined (Table 2). Most participants were female (n=26 or 86.7%). Sixteen of the participants (53.3%) worked at CHC-1. Almost

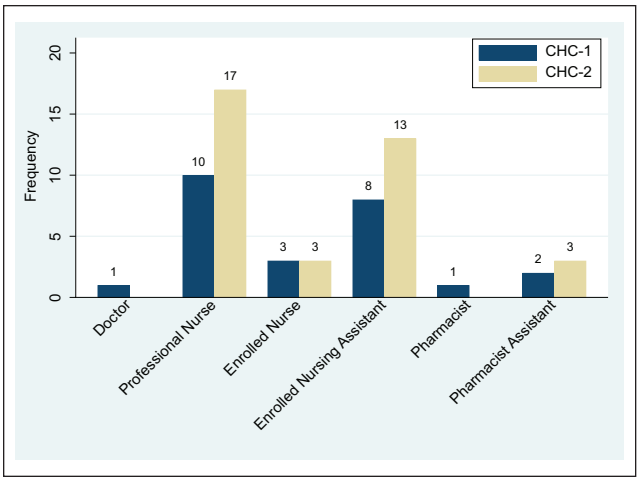

Figure 1. Profile of health professionals at both facilities.

Table 2. Profile of Study Participants.

Variables	Categories	n (%)
Sex	Male	4 (13.3)
	Female	26 (86.7)
Facility	CHC-1	16 (53.3)
	CHC-2	14 (46.7)
Professional rank	Professional nurse	19 (63.3)
	Enrolled nurse	5 (16.7)
	Enrolled nursing assistant	6 (20.0)
CHC-1	Professional nurse	9 (56.3)
	Enrolled nurse	4 (25.0)
	Enrolled nursing assistant	3 (18.8)
CHC-2	Professional nurse	10 (71.4)
	Enrolled nurse	1 (7.1)
	Enrolled nursing assistant	3 (21.4)

two-thirds of the participants (63.3%) were Professional Nurses (PNs), followed by 6 Enrolled Nursing Assistants (ENA) and 5 Enrolled Nurses (ENs) respectively.

Shown in Table 3 is that 50% of the PNs had 12 years of practice; 25% had less than 8 years of practice; and another 25% had more than 20 years of practice. ENs and ENAs had a median of 7 years of practice. Fifty percent of PNs had worked in their respective facilities for at least 8 years; 25% had worked for 3 years or less; and another 25% had worked for 14 years or more. Half of the ENs had worked in their respective facilities for at least 6 years; 25% for 4 years; and another 25% for 7 years. A quarter of ENAs had worked in their respective facilities for 3 years; another 25% for at least 23 years; and 50% had worked for at least 5 years in the current facility.

Whilst both facility managers reported that there were no staff shortages in their facilities, the CHC-2 manager reported that she would appreciate the addition of more

Table 3. Years of Experience of Nurses.

Variable	Category	n	IQR	Median	*P*-value
Years of qualification	Professional nurse	19	9-21	13	.540
	Enrolled nurse	5	5-16	8	
	Enrolled nursing assistant	6	7-27	8	
Years of practice	Professional nurse	19	8-20	12	.540
	Enrolled nurse	5	4-15	7	
	Enrolled nursing assistant	6	6-26	7	
Duration at this facility	Professional nurse	19	3-14	8	.975
	Enrolled nurse	5	4-7	6	
	Enrolled nursing assistant	6	3-23	5	
Years of practice	CHC-1	16	5.5-20	13	1.000
	CHC-2	14	7-18	10.5	
Duration at this facility	CHC-1	16	2.5-12.5	4	.350
	CHC-2	14	4-12	7.5	

Table 4. Staff Perceptions on Primary Care Services and HIV Management.

Variables	Categories	n (%)
Do you think UTT will be successful	Yes	27 (90.0)
	No	3 (10.0)
UTT will result in a higher defaulter rate	Yes	16 (53.3)
	No	14 (46.7)
UTT will result in increased resistance	Yes	15 (50.0)
	No	15 (50.0)
Patients with a high CD4 count should not be initiated on ARVs as they are likely to default	Yes	2 (6.7)
	No	28 (93.3)
How often do you think staff members refer to HIV guidelines/protocols/SOPs?	Never	2 (6.7)
	Rarely	7 (23.3)
	Regularly	19 (63.3)
	Do not know	2 (6.7)
Are these protocols accessible for reference by staff?	Yes	25 (83.3)
	Do not know	5 (16.7)
How is ARV uptake in this facility?	Low	4 (13.3)
	High	26 (86.7)
Are waiting times long in this facility?	Yes	10 (33.3)
	No	20 (66.7)
Do you think there are staff shortages in this facility?	Strongly agree	30 (100.0)

Abbreviations: SOPs, standard operating procedures; UTT, universal test and treat.

staff to her complement. All staff surveyed (n = 30 or 100%) reported that there were staff shortages in their facilities (Table 4).

Other perceptions recorded include 3 (10%) who thought Universal Test and Treat (UTT) would not be successful; would result in higher defaulter rates (n = 14 or 46.7%); would result in increased HIV resistance (n = 15 or 50.0%); and that patients with a high CD4 count who were in stage 1 should not be initiated on ARVs as they were likely to default (n = 2 or 6.7%). ARV uptake was considered to be low by 4 participants (13.3%). Waiting times were considered to be long by a third of the staff participants (33.3%). Eleven staff members disagreed that lack of staff training could negatively affect HIV management (Figure 2).

A total of 17 Nurses (56.7%) had undergone Nurse Initiated Management of Antiretroviral Therapy (NIMART) training, of whom 13 (76.5%) were at CHC-1. This translates to 9/9 professional nurses in CHC-1 and only 3/10 (30.0%) of professional nurses in CHC-2 who had undergone NIMART training. In total, there were therefore 12/19 (63.2%) of professional nurses who had undergone NIMART training. Looked at differently, nurses surveyed at

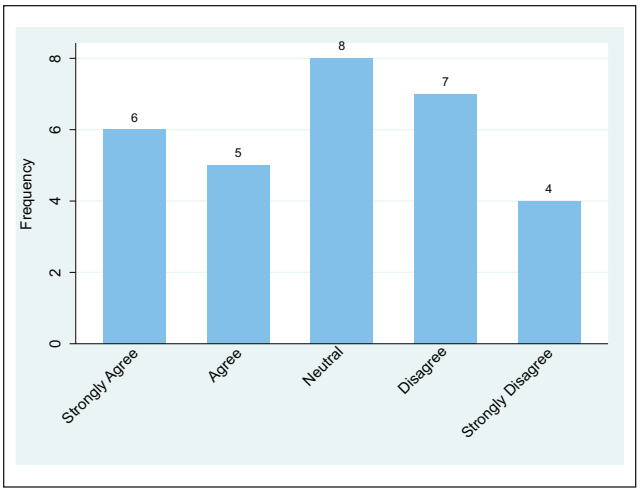

Figure 2. Does lack of staff training negatively affect HIV management?

Figure 3. Differences in level of knowledge between the 2 health facilities.

CHC-1 were 3.3 times more likely to have had NIMART training and this was statistically significant (PR = 3.3; 95% CI: 1.2-9.3; $P = .004$). As shown in Figure 3, 10 CHC-1 participants (62.5%) had adequate knowledge as compared to 7 (50.0%) from CHC-2, which is equal to the number who did not have adequate knowledge. Even though CHC-1 participants were 27% more likely to have adequate knowledge than CHC-2 participants (PR = 1.3; 95% CI: 0.6-2.6; $P = .491$) this was not statistically significant.

Service Delivery Platform and Medicines Supplies

Almost all participants (n = 29 or 96.7%) responded that they were aware of the Universal Test and Treat strategy and that their facilities were implementing the policy (Table 5). UTT was described as a strategy where HIV is tested and treated regardless of CD4 count (n = 25 or 83.3%); 1 participant simply expressed that UTT emphasizes patients knowing their HIV status, and others (n = 4 or 13.3%) could not describe it. All respondents (n = 30) said that HIV testing was offered to all patients in their respective facilities.

There were varying responses to the question on the blood specimen taken after an HIV positive test result as shown in Table 5. Almost a half of respondents (n = 14 or 46.7%) said they waited for blood results before patients were initiated on ARVs. The laboratory turnaround time was reported to be less than 7 days by the CHC-1 manager and less than 5 days by her counterpart from CHC-2. Four staff participants (13.3%) did not know the laboratory turnaround time, 17 (56.7%) said it was 1 to 2 days, 7 (23.3%) said it was 3 to 7 days, and 2 said it was 14 to 21 days. Treatment was said to be initiated immediately by 26 participants (86.7%) and 2 participants (6.7%) said it depended on the patient.

Drug stock-outs were said to be a rare occurrence by 5 of the participants (16.7%) and the rest (n = 25 or 83.3%) said they never had drug stock-outs. Facility managers both recalled an incident in March 2018 when they ran out of Lamivudine 150 mg. During drug stock-outs facilities often borrow from nearby facilities. Only 1 participant (3.3%) thought that the facility was not accessible to the community (Figure 4).

Information and Research

Table 6 and Figure 5 show the facilities' HIV indicators for a 6-month period. Of the total patients who were seen in the facilities in those 6 months, only 10.5% had an HIV test at CHC-1 and only 6.7% had an HIV test at CHC-2. The HIV incidences were 11.0% and 8.0% at CHC-2 and CHC-1 respectively. CHC-2 initiated 91.7% on ARVs and CHC-1 initiated 95.4% of HIV positive patients on ARVs. Only 66.4% of those patients who were on ARVs had suppressed Viral load at CHC-1 and only 54.7% had suppressed Viral load at CHC-2.

Nineteen participants (63.3%) thought that information management was not poor in their facilities; 7 (23.3%) were neutral and 4 (13.3%) thought that information management was poor (Figure 6).

Discussion

This study investigated health system barriers to the implementation of the Universal Test and Treat policy at selected primary care facilities in a rural South African setting. This study will not only contribute to policy development but will also hopefully enhance its implementation and add to the pool of scientific literature. Findings from this study

Table 5. HIV Management Practices in 2 Primary Care Facilities Studied.

Variables	Categories	n (%)
NIMART	Yes	17 (56.7)
	No	13 (43.3)
Awareness of universal test and treat	Yes	29 (96.7)
	No	1 (3.3)
Description of UTT strategy	HIV test and treat regardless of CD4 count	25 (83.3)
	Patients must know their HIV status	1 (3.3)
	Don't know	4 (13.3)
Bloods taken after positive HIV test	All relevant tests	1 (3.3)
	CD4 + **VL** + **creatinine** + **U&E**	1 (3.3)
	CD4 + **creatinine** + **hepatitis B** + **PCR** + **VL**	15 (50.0)
	Baseline bloods	8 (26.7)
	CD4 + **VL** + **creatinine clearance** + **hepatitis B**	4 (13.3)
	Don't know	1 (3.3)
Do you wait for blood results before initiation	Yes	14 (46.7)
	No	15 (50.0)
	Don't know	1 (3.3)
Laboratory turnaround time (days)	1-2	17 (56.7)
	3-7	7 (23.3)
	14-21	2 (6.7)
	Don't know	4 (13.3)
Time to treatment initiation (days)	Immediately	26 (86.7)
	Depends on the patient	2 (6.7)
	After a month	1 (3.3)
	Don't know	1 (3.3)
Average time (months) for repeat HIV test if negative	3 months	29 (96.7)
	4 months	1 (3.3)
Drug stockouts	Never	25 (83.3)
	Rarely	5 (16.7)

Abbreviations: PCR, polymerase chain reaction; U&E, urea and electrolytes; VL, viral load.

form a body which health policymakers can reference when assessing the progress of the UTT strategy implementation at primary care facilities, particularly those in the rural Eastern Cape or other similar settings.

Additionally, the findings of this study may be used by those who are directly involved in the implementation or tasked to monitor the implementation of the UTT policy. Findings will be shared with the health facilities that participated in this research and the broader Eastern Cape department of health (Provincial, District, and Sub-district). These findings will also contribute to the understanding of the UTT strategy among healthcare workers at primary care level. This study is unique in that it reviews policy implementation early on after its implementation for a program (HIV management) that has been changing rapidly over the past few years.[7,20,21]

A health system is described as consisting of all organizations, institutions, people, and actions whose primary intent is to promote, restore, or maintain health.[22,23] A positive interaction between the 6 building blocks is believed to strengthen a health system: service delivery, health workforce, health information systems, access to essential medicines, financing, and leadership/governance.[22,23] The health system as a whole is more than a sum of the different parts, meaning that the health system is only strengthened by the continuous, simultaneous, and coordinated interaction of the 6 building blocks.[6,22,23]

This study found that both facility managers had been appointed on a permanent basis for a period of over a year in their current positions. In addition, there was leadership stability in both facilities as evidenced by the fact that the 2 managers boasted management experience of not less than 8 years. The manner in which managers go about their work plays a critical role in the performance of the facility. For example, if a facility has good and stable management it can overcome some of the contextual and health system barriers.[6]

This study also found that the 2 health facilities did not have customized protocols and Standard Operating Procedures for the management of HIV but instead only relied on the national HIV management guidelines. This is surprising as both these facilities had more than 10 years of

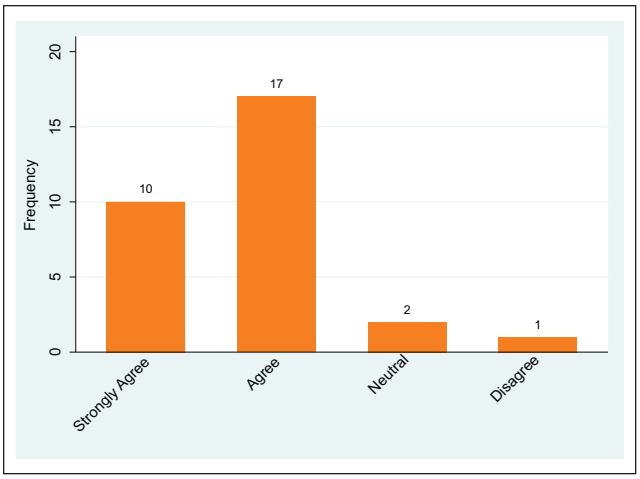

Figure 4. Accessibility of facility to community.

HIV management experience. SOPs are important for any organization because involving people in the crafting of the document will trigger a positive response and ownership.[24] Use of SOPs can also allow for performance evaluations and continuous improvement on how things are done and thus strengthen clinical governance.

Even though 83.3% of the participants reported that HIV guidelines were accessible in their facilities, it is of concern that 16.7% of the participants did not know much about the guidelines and where they could be found. The use of guidelines ensures the standardization of practice.[25] However, this is only true if those who implement the guidelines are properly informed about them and can refer to them if needed. Of further concern is that 30% of the participants either did not refer regularly, had never referred to or did not know about the guidelines. Just as a guideline that is easy to understand is more likely to be implemented, characteristics of professionals for example awareness of the existence of the guideline and familiarity with its content; environmental characteristics such as staff shortages and time or even lack of support from peers or superiors, etc. may also be associated with increased uptake.[11]

A policy or guideline is not useful on the wall or in a shelf but only when those who implement it understand the contents of the document.[24] Management and leadership have to constantly assess end user interpretation of policies. A key dimension of the implementation process is whether, and in what ways, implementing agents come to understand their practice, potentially changing their beliefs, and attitudes in the process.[11] Additionally, development of context specific SOPs are key to ensuring continuous performance evaluations of staff.

Quality of care improvement can be achieved through clinical governance and retraining of the workforce.[6] Clinical governance ensures that all health workers are responsible for safeguarding high standards of care and producing the best clinical outcomes for patient care.[6] Clinical governance ensures that everyone understands their role within the team, through the employment of strategies such as, introducing SOPs which are aimed at improving the quality of care and safety.[6] These protocols assist health practitioners improve their professional practice and the quality of care which will then result in improved patient outcomes.[11]

However, availability of guidelines does not necessarily mean implementation thereof.[11] For example, this study found that both health facilities did not have any SOPs for HIV management. Even though there were claims by some staff members of the presence of SOPs, they could not state where they were. In this regard the findings of this study suggest a lack of pro-active or creative leadership or lack of structured planning.[26]

The lack of proactive leadership can be improved through a variety of ways including but not limited to, continuous education and training (including self-learning programs); structured academic courses; peer-to-peer learning that is meeting other managers at regular intervals to share experiences, challenges, and solutions; and regular reflective meetings between managers and their staff to review their work, identify areas that need improvement, and ways to improve the service.

In their efforts to manage HIV, health systems in Low- and Middle-income countries (LMICs) are hindered by shortages of health professionals.[27-30] Despite this evidence, some argue that there have not been enough concentrated efforts by governments to address the challenge of health professionals' shortages and maldistribution given their critical importance to the functioning of health systems.[30,31]

For example, a South African HIV study revealed that shortages of human resources in clinics was the most common reason for ARV initiation delays.[32] Global evidence on healthcare staffing in rural settings suggests that there is indeed an overall shortage of healthcare staff in primary care facilities.[29] Shortages of skilled health professionals in African health systems makes it difficult for people living in rural settings (77%) to access quality care as compared to their urban counterparts (50%).[33] In South Africa, for instance, only 19% and 12% of nurses and doctors respectively serve approximately 46% who live in rural settings.[20,30]

This study found contrasting observations between healthcare staff and their managers. When asked whether their facility had shortages of staff to implement UTT, both managers suggested that the staff was adequate, but they could do with more. Staff participants from both facilities, however, believed that their facilities did not have adequate staff to implement UTT.

Another reason for backing the argument of healthcare staff, apart from the statistical evidence quoted above, is

Table 6. HIV 6-Monthly Indicators in Both Facilities.

Indicators	CHC-1 n (%)	CHC-2 n (%)
Total patients know their HIV status	2177 (10.5)	1213 (6.7)
Total number of HIV positive results	174 (8.0)	133 (11.0)
Total HIV positive patients initiated on HAART	166 (95.4)	122 (91.7)
Total number of viral loads suppressed	357 (66.4)	295 (54.7)

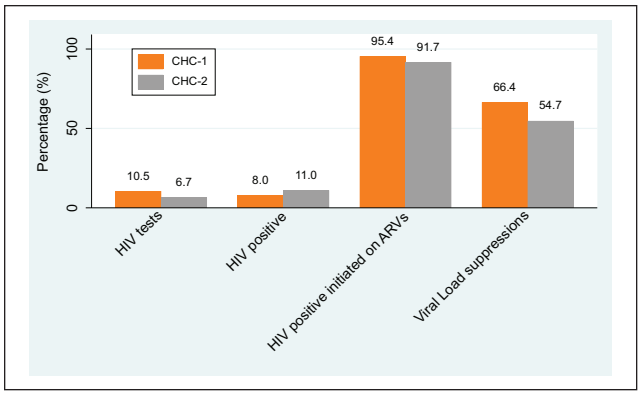

Figure 5. Achievement of 90-90-90 targets in facilities.
*Total number of viral loads collected = 539 and 538 respectively.

that according to the South African Nursing Council, each category of nursing has its competencies. One can assume that the main reason for the statements by facility managers that the staffing levels are adequate, which contradicts the views of their subordinates, is that they do not want to be seen as having a negative attitude, as they both hinted at a need for additional staff.

Grobler et al[30] also cited the problem of shortage of health personnel to be a barrier to the continuing service expansion, which is what UTT requires.[7,30] Quality of care could also be undermined by the increased volumes of patients due to UTT implementation, lack of skills among healthcare staff, and staff shortages.[34] Regardless of the added workload UTT implementation brings, healthcare personnel should not compromise quality.[34]

This study found that quite a number of nurses were not too comfortable with the management of HIV. For instance, on questions about the management of HIV they indicated that they would refer to a doctor. This knowledge gap on the management of HIV which has been highlighted above is further emphasized by the finding that only 63.2% of the nurses who are supposed to manage HIV at primary care facilities are trained in NIMART.

Comparison of the 2 sets of nurses in terms of NIMART training showed that all studied professional nurses in CHC-1 were trained, whilst only 30% of professional nurses in CHC-2 were NIMART trained. This finding suggests inequitable access to knowledge between the 2 facilities. If the purpose of NIMART is to capacitate nurses who work at HIV service points and improve access to ARV services,[8] this finding calls for urgent interventions to bridge the identified gaps, for example the introduction of awareness/training programs aimed at improving the quality of HIV management at primary care facilities. Starting with universal NIMART training for all primary care professional nurses.

A facility manager should ensure healthcare service provision is of high quality. Thus, the non-availability of training programs in both facilities can be attributed to leadership failure to identify training needs for their staff.[12] Health facilities should schedule regular follow-up training of all staff to maintain and improve quality of care.[6]

More than 75% of the health professionals have experience of more than 12 years of practicing as nurses and more than 8 years practicing at their current facilities. Ninety percent of the participants believed that UTT would be successful. However, almost half of participants believed that it would lead to higher defaulter rates and lead to an increased HIV resistance.

Long patient waiting times is a common problem faced by many health facilities.[28] A third of the participants also highlighted the problem of long patient waiting times in both facilities. Factors that lead to long patient waiting times include persistent shortage of healthcare workers, poor scheduling, and poor management of patient flow in most settings.[27]

Even though most participants showed their understanding of UTT, there were participants who could not describe UTT. The fact that a half of the respondents indicated that they waited for blood results before they initiated a patient on ARVs suggests that not all nurses adhered to the WHO HIV management guidelines and protocols, which is another failure of leadership to ensure that those guidelines and protocols are adhered to by all staff.[14,35,36]

Notwithstanding, laboratories are known to be important role players in the HIV treatment and prevention cascade.[37] Slow and unreliable turnaround of HIV results due to shortages of transport at primary care level has an undesirable impact on clinical decision-making.[7] To counter this problem, the Test and Treat strategy was introduced in South

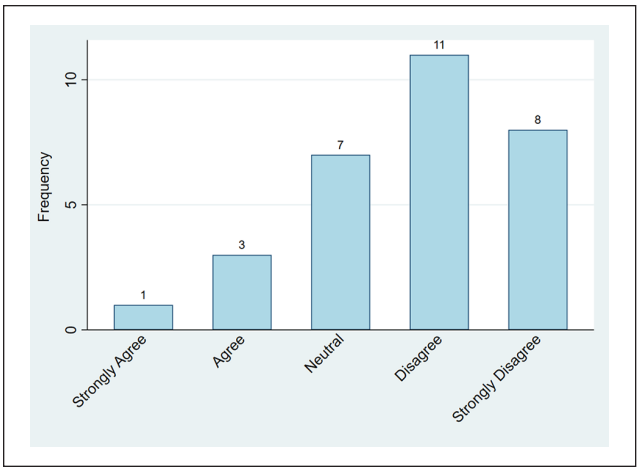

Figure 6. Perception of information management in facilities.

Africa to ensure that all people diagnosed with HIV are offered ARV regardless of their CD4 count.[6] As such, efficient laboratory services are important in the reduction of patient attrition in the HIV treatment and prevention cascade.[37]

The problems in handling referrals and long turnaround for laboratory testing act as a barrier to retention to care for initiation on ARVs.[34] More than 80% of staff indicated that the turnaround time of blood results was less than 7 days which made them believe that the laboratory services were efficient. In fact, a 7-day waiting period is inefficient if one considers the fact that it only takes 48 hours for creatinine results to be available.[26] The study also found that 86.7% of the participants indicated that they initiated ARVs immediately while only 6.7% indicated that they depended on a patient's clinical profile.

Shortages of drugs and other commodities act as barriers to ARV initiation.[38] For example, in South Africa over 1 in 3 facilities is affected by ARV stock-outs.[10] In this study drug stock-outs are said to be a rare occurrence with over 83% participants (nurses) indicating that they never had drug stock-outs. This finding was echoed by the facility managers who both indicated that drug stock-outs only occurred once, when they ran out of Lamivudine 150-mg in their respective facilities.

Participants indicated that when they see that they are running out of stock while they await their order from the district, they often borrow from nearby facilities. Notwithstanding, the fact that participants stated that they did not run out of stock, we can conclude from this finding that both health facilities do run out of drugs, but due to good working relations with other health facilities they are able to get these drugs before they reach a crisis situation of not being able to provide treatment to patients.

A well-functioning Health Information System is one that ensures the production, analysis, dissemination and use of reliable and timely information on health determinants, health system performance, and health status.[23] Access to reliable information is very critical for managers and service providers in order for them to make sound decisions when they monitor performance and manage services.[23] In this study, 63% of participants believed that information management was not poor at their respective facilities. Almost 37% of the participants were either not sure or thought that information management was poor at their respective facilities.

This information is critical for tracking progress toward achieving the 90-90-90 targets (number of patients who know their HIV status, number of patients who have been initiated on ARVs, and patients on ARV treatment who had suppressed viral load). This research also looked at the progress made by the 2 health facilities toward achieving the three 90s.

Both facilities performed poorly in terms of the first 90 as they recorded 10.5% and 6.7% of patients with an unknown HIV status who were offered an HIV test in a 6-month period. This is a strange finding because participants had indicated that an HIV test is offered to all people who visit the health facility. Among other reasons for this, is the incapacity of staff members who have not been trained in NIMART, which might make them feel uncomfortable in managing HIV patients.[25]

In terms of the second 90, both facilities are doing well with more than 90% of HIV positive patients initiated on ARVs. This may be because fewer people are tested for HIV in both facilities. Even though more can be done in ensuring that health facilities recorded higher percentages than the 66.4% for CHC-1 and 73% for CHC-2 respectively in the attainment of viral load suppression, it is progress in the right direction.

This study found that the perception of most participants (63.3%) regarding information management was positive with 23.3% neutral. The remaining 13.3% of all participants believed that information management was poor in the 2 facilities. This is an important finding because of the importance of sound and reliable information in a number of areas including policy development and implementation, human resources development, health education and training, service delivery, etc. It is however worth noting that this information requires a system that will ensure that there is continuous data collection, analysis, and use. The findings of this study could be telling us that there is lack of data analysis and use, as lack of human resource development has been reported among the key challenges at these 2 facilities.

Even though all efforts were made to minimize limitations, this study has some limitations. Firstly, the findings do not have external validity as they cannot be generalized to other Community Health Centers in rural areas or the Eastern Cape. The findings are however internally valid for the 2

facilities studied. It is further hoped that some features of this study will be matched across other similar health facilities. Secondly, the sub-districts were selected due to convenience and funding requirements. These could have generated a selection bias, which might limit validity and reliability of study findings. Having external validity was not, however, an aim of this study. Findings from this study will, however, provide basis for a bigger study to be conducted to test hypotheses and/or develop theories. Third and lastly, other issues that could be a subject of future studies include the inability of this study to quantify the skills-mix of the health facility, the inability to quantify the vacancy rate, and the inability to conduct qualitative interviews with health professionals as they directly relate to health systems barriers.

Conclusion

This study has been able to identify potential barriers to the implementation of the UTT strategy at the selected facilities. Leadership is a challenge for both facilities, for example there are no structured programs in place to monitor performance of healthcare staff, identify knowledge gaps, and for continuous staff development. The facilities also lacked good clinical governance practices as evidenced by the lack of customized protocols and SOPs.

It is clear that experience alone is not enough for nurses to manage a health facility. Perhaps there is a need to equip them through continuous training or workshops. Due to the absence of structured programs for continuous development of the workforce, it has also been found that there is poor knowledge and understanding of the management of HIV and the UTT strategy in general among the nurses. It has also been found from this study that there is lack of uniformity in terms of management of HIV among nurses, because some have been reported not to be adhering to the universal guidelines and protocols recommended by WHO on the management of HIV.

Not only were there human resource shortages but there were also professional developmental gaps identified among nurses. Service pressures were also exposed through the reportedly long waiting times. These barriers therefore need to be removed by simultaneously managing all 6 components of the health system as the whole is more than a sum of the different parts.

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Author Contributions

ORM: Conceptualization, sourced funding, sourced literature, writing original draft, editing drafts, submission of article. WWC and SAM: Sourced literature, analyzed data, editing drafts, approval of final article. SCN and XN: Editing of drafts.

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ORCID iDs

Onke R. Mnyaka https://orcid.org/0000-0002-1834-6136
Sikhumbuzo A. Mabunda https://orcid.org/0000-0001-9458-3742
Sibusiso C. Nomatshila https://orcid.org/0000-0003-4130-0707

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Availability of Data and Resources

All data used in the study will be available from the corresponding author upon reasonable request.

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