

**REPORT**

**ON**

**AN ASSESSMENT OF FACTORS ASSOCIATED WITH ADHERENCE TO  
ANTIRETROVIRAL TREATMENT IN ALBERT HORSFALL MEDICAL  
CENTER, ABUJA, NIGERIA**

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**Key words:**

HIV/AIDS, PLHIV, anti-retroviral therapy, HAART, adherence, facilitators, barriers,  
self-report, CD4 count, pharmacy log.

## Acronyms

AIDS	Acquired immunodeficiency syndrome
ART	Antiretroviral therapy
ARVs	Antiretrovirals
FMOH	Federal Ministry of Health
HAART	Highly active antiretroviral therapy
HIV	Human immunodeficiency virus
NACA	National Action Committee on AIDS
NASCP	National AIDS & STI Control Program
PEP	Post-exposure prophylaxis
PLHIV	People living with HIV
PMTCT	Prevention of mother to child transmission
VCT	Voluntary counseling and testing
SR	Self-report

## **ABSTRACT**

Albert Horsfall Medical Center (AHMC) is one of the first 25 centers that started the national Antiretroviral Therapy (ART) Program in Nigeria in 2001. The facility had 162 registered patients and 109 of them were on anti-retroviral drugs at the time of the study. The aim of the study is to determine the characteristics associated with ART adherence, in Albert Horsfall Medical Center (AHMC), Abuja, Nigeria. The objectives are to measure the adherence to ART; assess the association of the demographic characteristic of patients on ART with adherence to medications in the facility; and to establish patients' perspectives to adherence and impediments to compliance to ART in the center. The cross-sectional study of people living with HIV (PLHIV) receiving ART employed the use of self-report questionnaires, document review (pharmacy and clinical records) and the measurement of the current CD4 counts and viral load of patients (biological measure). Eligibility for participation as a respondent was limited to adult PLHIV who have been receiving ART in the facility in accordance with the Federal Ministry of Health (FMOH) ART guidelines for one month or more. Pretested questionnaires were administered to eligible persons by trained interviewers and blood taken for CD4 and viral load tests. The data was analyzed using EPI Info 2000 computer package. Results showed that 93.9% of respondents were reported to be adherent to the regimen and socio-demographic characteristics of the respondents namely age and marital status were not predictive of adherence. However, the adherence rate was not validated by the viral load test, as only 13.6% of the adherent group had no virus detected in their blood sample. Interventions should be implemented to improve patients' adherence, and a follow-up study should be done to assess the outcomes of such interventions.

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Topic: AN ASSESSMENT OF FACTORS ASSOCIATED WITH ADHERENCE TO ANTIRETROVIRAL THERAPY IN ALBERT HORSFALL MEDICAL CENTER, ABUJA, NIGERIA

## **1.00 INTRODUCTION**

The majority of the 42 million people living with HIV/AIDS in the world are in Sub-Saharan Africa (28 million); and Nigeria contributes more than 3.5 million adults to this figure (FMOH, 2004). Public health indices of Nigeria portray a precarious condition in terms of health, education and social indicators. It is known that 2 of every 3 (66%) Nigerian live below the national poverty level, Less than half (49%) has access to potable water and only 41% has access to adequate sanitation; and the situation is compounded by the fast growing multi-faceted impacts of HIV/AIDS (UNDP, 2002). It is vital to urgently reverse the trend of the epidemic.

Nigeria is showing commitment in combating the epidemic through a multi-sectoral approach by the National Action Committee on AIDS (NACA). With the Federal Ministry of Health (FMOH), NACA formulates and implements policies that provide care and support for PLHIV in Nigeria. Of all activities, the most potentially rewarding is the provision of antiretrovirals (ARVs) for clinical management, prevention of mother to child transmission (PMTCT) and post exposure prophylaxis (PEP). Of the estimated 300,000 to 700,000 that require ARV, 13,433 adults as at mid-2004 (excluding private initiatives) have access to the drugs through 25 government owned medical facilities (FMOH, UNAIDS, 2004). It has been projected that about one million will require ARV by 2009 (Miles et al, 2006). Albert Horsfall Medical Center is one of the 25 sites offering the drugs. While the program has been

expanded beyond the 25 sites, problems of adherence and emergence of resistant strains to the first line drugs remain a cause for concern.

AHMC, a government owned primary health medical center is located at Garki District in the center the Abuja metropolis, has 162 patients registered in the clinic and 109 of them were on anti-retroviral medications at the time of the study. Patients that were not listed to be on ARV drug were not qualified to commence the medications, deceased or lost to follow-up. There are five nurse counselors that undertake routine counseling, which includes pretest, posttest and adherence counseling on clinic days. Additionally, on every visit at the point of drug collection, the pharmacist is also required to counsel each patient on adherence.

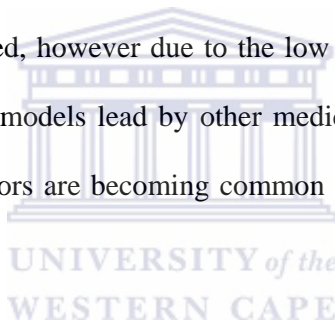
The study which used self-report questionnaire administration, biological measures of CD4 count and viral load and review of the pharmacy log book, sets out to describe the demography and the adherence of patients as well as the realities of lapses in the implementation of anti-retroviral therapy program, primarily peculiar to Albert Horsfall Medical Center with a view to improving services.

## **2.00 LITERATURE REVIEW**

**2.01 Preamble:** The literature review addressed the following issues: Models of care for ART service delivery, HIV epidemic in Nigeria, the level of non-adherence in ART, the demographic characteristics of non-adhering patients, adherence facilitators and barriers, interventions to improve adherence, methods to measure adherence and identification of gaps in knowledge.

### ***2.02 Models of ART Services:***

Models of care for ARV service delivery have been well documented by Pienaar, Mayer & Cleary et al (2006) who in the report of a research into ART services in Western Cape, South Africa identified several models. These models are generally grouped into facility-based, community-based and individual care services. The facility-based models are basically vertical disease services programs, while community-based programs are services that employ the services of counselors (usually PLHIV) who operate in the communities and refer people appropriately to designated treatment point(s). Individual care provider service is a service provided by private practitioners (D. Pienaar, Myer, Cleary et al, 2006). The vertical programs are usually physician oriented, however due to the low physician-population ratio in most low resource settings, models lead by other medical personnel such as nurses, clinical officers and counselors are becoming common (Miles, Clutterbuck, Seitio et al, 2006).



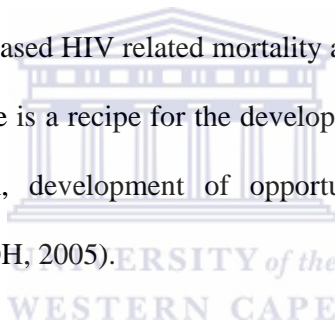
### ***2.03 HIV Epidemic in Nigeria and FCT:***

Since the first case of AIDS in Nigeria was reported in 1986, the prevalence in Nigeria among pregnant women attending antenatal clinics has consistently grown from 1.8% in 1991 to 5.8% in 2001. The national mean prevalence for 2003-sentinel survey is 5.0% (FMOH, 2004). More than 3.5 million adults were estimated to be living with HIV in Nigeria in 2001 (FMOH & UNAIDS, 2004). Though the 2003 mean prevalence stands at 5.0%, experts agree that the epidemic has not stabilized, as the prevalence was more than 10% in some communities. AHMC is situated in Abuja, the capital of Federal Capital Territory (FCT). The mean prevalence in FCT has risen in consonance with the national scenario from 7.2 % in 1999 to 10.2% in 2001;

however, the 2003 figure of 8.4% is higher than the national mean (FMOH, 2004. & 2005). FCT had the third highest HIV prevalence of the states in Nigeria in 2003.

#### ***2.04 Non-adherence and its implications:***

Non-adherence is a major deterrent to a successful ART program. With the launching of the “3 by 5” initiative in 1<sup>st</sup> December 2003, Nigeria targeted ARV coverage of 300,000 by the end of 2005. There is anxiety over the ability of the program to maintain good adherence. The benefits of appropriate ART adherence are well known to include sustained viral suppression, recovery of immune system (increased CD4 count), experiencing less opportunistic infections, attaining a better quality of life, increased productivity, decreased HIV related mortality and increased life expectancy. Conversely, poor compliance is a recipe for the development of drug resistance, viral rebound, decline in health, development of opportunistic infections and rapid advancement to AIDS (FMOH, 2005).



Adherence in a medical sense simply means the measure of the total compliance of a patient (whether self motivated or service assisted) to a health related regimen or instructions. About 50% of patients across a wide range of medical conditions are non-compliant; and 80% compliance is generally accepted as ideal in chronic diseases (Levine, 1998). Vanhove and colleagues (1996) reported increased viral load within days of ARV drug holiday in patients who had initially attained viral suppression (Cinti, 2000), therefore ART requires more adherence for optimal effect. Further clarification is realized when considering the study by Patterson et al. (2000), who reported that with 95% adherence to regime, 78% of patients achieved undetectable viral load; with 80 – 94 % adherence, 49% of the patients will attain undetectable



viral load and below 80% adherence, only 20% of patients will attain undetectable viral load. The conclusion therefore is that adherence to ART below 95% would most likely not produce complete suppression of HIV viral replication.

## ***2.05 Results of Adherence/adherence interventional measures:***

### ***2.051 The Magnitude of Non-adherence:***

Highly Active Antiretroviral Therapy (HAART) implies the use of a combination of at least three drugs from at least two classes of ART. Due to pill burden, pill fatigue, side effects and intricacies of dosing, adherence is difficult to achieve in HAART. Kumarasamy (2003) after a literature review numerated several factors that have been associated with non-compliance following literature review. The review identified patient's knowledge of the disease, duration on medications, complexity of treatment, social support available to patient and patient's perceived benefits as some of the factors. Additionally, relationship between patient and service providers, depression, alcohol and substance abuse, and self-efficacy were also listed as factors that may influence compliance of patient on antiretroviral medications in the same review. In another literature review by Chesney and colleagues (2000), estimates of HIV medication non-adherence ranged from 50% to 70% (Jones, 2001). A review of adherence to ARV drugs in a variety of care settings in San Diego, California revealed that 28% of patients had poor adherence (<80%), 23% of the patients adhere to the regime fairly (80% to 90% adherence) and 50% of patients adhered appropriately to their medications (>90% to 100%) (Gifford, Bowmann, Shiverly et al, 2000).

Some studies in Sub-Saharan Africa have demonstrated exceptionally high adherence rates above 90%. Laniece, Ciss, Desclaux et al (2003) in an observational prospective cohort study of Senegalese adults had a mean adherence of 91%. Similarly, Orrell et al (2003) reported a mean adherence of a semi-urban, HIV-infected ART naïve South African cohort (CTAC- Cape Town AIDS cohort) up to 48 weeks of medication, to be 93.5%. A study done in Botswana showed relatively lower adherence. In a cross sectional study using a self-report questionnaire, 54% of the patients were adherent. As in the other two African studies, the major barrier to adherence was financial constraints (44%). After removal of cost (the main predictor for adherence) using logistic regression, predicted adherence increased from 54% to 74% (Weisser, Wolfe, Bangsberg et al, 2003).



### **2.052 Facilitators & Barriers:**

#### **(a) Patient Related (Demographic) Factors:**

The review of several studies on adherence to antiretroviral drugs has shown that generally, demographic characteristics such as age, sex, income, education and employment status are not predictive of adherence (Pettersen et al (2000); Bersh (1999); Orrell et al (2003); Laniece et al (2003). However, a few reports have shown some associations between demographic factors and adherence. Singh et al (1999) reported that non-whites are more likely than whites in USA to be less adherent (OR= 22.5, P+0.013) and Pinheiro (2002 and Monreal et al (2002) found education to be predictive of the level of adherence in patients on ARVs in Brazil. Orrell and colleagues (2003), while agreeing that low socio-economic status is not associated with poor adherence in a South African study (the drugs were free), reported increasing age and speaking the same language with the service providers to correlate

with improved adherence and virologic out comes. Weiser et al (2003) reported similar findings from Botswana. The Senegalese study by Laniece et al (2003) and the aforementioned study in Botswana highlighted costs of medication and insurance coverage issues as reasons for gaps in treatment.

Forgetfulness is the most frequently cited of all reasons given by patients for poor compliance (Holzemer et al, 2000; Kumarasamy, 2005; Montreal et al, 1990; Chesney et al, 2000). Levine 1998 acknowledged that forgetfulness is more profound when patients' routine has been disrupted as in travelling or even on weekends. Forgetfulness in absence of neuro-psychiatric impediments may be viewed as a marker for the totality of social support, psychosocial influences, trust in the service and patient's met expectations by the therapy. It may be a pointer to an underlying social problem or a sign of service inadequacy.

(b) Psychosocial influences on the patients may constitute the most important group of factors affecting adherence in the presence of adequate access to ART (Cinti, 2000; Besch, 1995; Singh et al 1996). These concerns, such as patient's understanding of the disease and regimen and reasons for taking each medication may have profound effect on adherence (Daar et al, 2003). Additionally the patient's attitude, cultural and health beliefs, coping skills and trust in the therapy and the medical establishment ought to be positive, in order to attain reasonable adherence. More specifically, the degree to which antiretroviral efficacy meets patients' expectations affects adherence; such met expectations motivate very sick patients to attain high adherence rates. The level of motivation, existing stress, active substance abuse and the level of self-efficacy of patients, all affect drug adherence (Daar et al, 2003). Wenger and colleagues found that heavy alcohol and drug users significantly adhere less than

nonusers (Cinti, 2000). Though this assertion agrees with reports from some other studies, not all studies are consistent, especially regarding injection users.

(c) Health Care related factors that may affect adherence are physician-patient relationship, the presence of 'significant other', presence of a supportive care provider and support peer group (Levine, 1998; Pinheiro et al, 2002). While the use of multidisciplinary services- the "one stop shopping approach" - improves adherence, it has been recognized that a strengthened referral system, simple regimen (number of pills, frequency of dosing and food conformity) all affect adherence (Cinti, 2000; Eldred et al, 1998). Orrell et al further acknowledged that three times daily therapy was the strongest predictor for both poor adherence and virologic failure in a multivariate analysis; and that the best improvement in adherence comes with the reduction of dosing frequency from three to two times a day. Brigado et al noted interestingly that in Brazil, naïve patients were less compliant, however adherence seems to improve as treatment progresses. Another dimension was introduced, when Lanciece et al reported higher adherence in Efavirenz-containing regime than indinavir-containing regimens, a result that may be related to pill burden and side effects.

### ***2.06 Adherence Interventional Measures:***

Directly observed treatment (DOT) may not be easily achieved in antiretroviral therapy. Addressing psychosocial, demographic and health factors that affect adherence are the hallmark of adherence enhancement (Romanelli & Pomeroy, 2000). Improving adherence should be proactively done through identification of possible

barriers during counseling and planning how to appropriately address them before the first drug prescription is made. Reviews by some authorities have recognized some strategies that may be included in developing an adherence improvement program (Cinti, 2000; Daar, Cohen, Remien et al, 2003; Levine, 1998). Such strategies include those that encourage close patient-provider contact, social support and education, treatment of co-morbid conditions and anticipating problems that may promote non-compliance. Also, regimen rehearsal, simplifying regimen and use of pill organizers are other interventional measures that may improve adherence.

### ***2.07 Study Design and Methods in Measuring Adherence to Antiretroviral Therapy:***

Though the majority of the initial studies employed clinic based quantitative designs (chiefly cohort and cross-sectional), qualitative studies are becoming popular, especially in action-oriented research of health systems (Kumarasamy et al, 2005 & Stone et al, 1998). Studies by Kumarasamy (2005) and Stone (1998) assessed knowledge and awareness of ARVs, experience taking ARVs and adherence to ARVs using qualitative methods. Stone et al had six focus group interviews in ART patients from three teaching hospitals and two community health centers, while Kumarasamy and colleagues used in-depth interviews of 60 patients receiving primary care in an NGO to gather their data.

The available methodologies cannot measure adherence with certainty, therefore more than one method is usually used in studies; and often complimented with a surrogate marker such as viral load or the cheaper option of CD4 count to gauge the ability of these methods to measure adherence (Cinti, 2000; Harrigan et al, 2005; Murri et al, 2004). Cinti further stated clearly that outside DOT (Directly Observed Treatment),

there is no “gold standard” for adherence and that though DOT is being advocated for in recent times, it appears impracticable in antiretroviral therapy, because it is difficult to directly observe patients over long periods of time. Levine (1988) summarized the methods used in assessing compliance with advantages and disadvantages inherent in each method to include self-report (SR), provider assessment, pill count, Medical Electronic Monitoring System (MEMS) and the use of biological monitoring systems.

SR has been used in several studies because of its simplicity in practice (Kumarasamy, 2005; Murri et al 1998 & Safren et al, 2005) though it has the inherent tendency to overestimate compliance (Sackett et al, 1975). Nevertheless, Cinti, S. K. (2000) noted that the accuracy of SR as a tool might be improved by careful wording of the question to formulate specific and non-judgmental inquiry. Additionally, complimenting with pill counts, biological measures and pharmacy log may improve its validity (Demasi, Tolson, Pham et al, 1999; Chesney 1997; Haubrich, Little, Currier et al, 1999; Gifford, Bormann, Shiverly et al; 2000). Laniece et al (2003) used SR, viral load and pill count in their study. The mean adherence (91%) was validated to some extent by expected high viral load in less adherent patients; nevertheless the level of false positive adherence results may still be significant. In a cross sectional study in Brazil, 57% of patients reported less than 95% adherence, which was much lower than reports from other parts of Brazil, although the use of SR in the study was validated by the demonstration of a significant association between viral load below 500 copies/ml and good adherence (Pineiro et al 2002).

### ***2.08 Evaluation of the knowledge:***

The literature review has revealed that optimal benefits of antiretroviral therapy can only be achieved at appropriate levels of adherence. Furthermore, studies have shown

that adherence is underpinned by a myriad of barriers and facilitators that come into play in different magnitudes, depending on the socio-economic, psychosocial and cultural environment. It is therefore pertinent to search for factors that are peculiar to the organization concerned, prioritize them, and intervene in accordance to the most pressing and feasible needs of the organization, while recognizing individual patient's needs. The essence of the research, time and resources (financial, manpower and material) available for the study, are all factors that may affect the design and tools chosen in a given circumstance.

Literature available to the author has indicated a relative paucity of studies on adherence to antiretroviral medications in Nigeria, though antiretroviral drugs have been in use officially since 2002. There is a need to investigate what factors may exist in different localities in Nigeria, that may affect ART adherence. Issues such as adherence patterns, factors associated with non-adherence, effect of poor adherence on the success of ART, the level of resistance to antiretrovirals and monitoring of adherence interventional programs should be examined, in the context of the customs and culture of the people. At present the expected behavior of HIV positive patients and service providers are projections from experiences exogenous to the Nigerian environment. The need to gather local evidence and to develop evidence based options in antiretroviral management has never been greater, especially with the need to scale up coverage.

Due to limited logistics and time available to the researcher, the study concentrated on the users of the facility. Triangulation of methods of data collection was undertaken to

increase the validity of the quantitative data. Results from this study were used to formulate and recommend interventions for improved ART adherence in the facility.

### **3.0 Aim and Objectives**

**3.01 Aim:** To determine which factors affect adherence to ART among HIV positive patients in Albert Horsfall Medical Center (AHMC).

#### **3.02 Objectives:**

- I. To measure the adherence to ART in patients attending AHMC.
- II. To assess the association of demographic characteristics of patients on ART with adherence to HAART in AHMC.
- III. To explore AHMC patients' perspectives on facilitators and barriers to adherence to ART.

### **4.00 METHODOLOGY:**

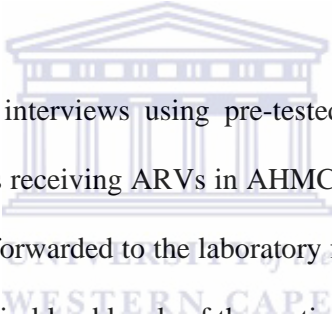
**4.01 Design:** A written approval of the study by the management of the facility was obtained before the commencement of the research. Additionally, stakeholders involved in the study were informed of the fact that the study is a part requirement for the award of an MPH degree to the researcher by The University of the Western Cape, Republic of South Africa.

The research was a cross sectional study using self-report (SR) questionnaires, complimented by document review (clinical and pharmacological records) and biological measures (CD4 count and viral load) of each participant.

**4.02 Population of study and eligibility:** The population of study consisted of adult PLHIV receiving antiretroviral therapy in AHMC. Eligibility of participants included adult PLHIV who met the FMOH criteria for ART in Nigeria, which include patients



with WHO stage IV disease (irrespective of CD4 count), WHO stage III disease with CD4 count less than 350/mm<sup>3</sup>, and stage I & II disease with CD4 count of 200/mm<sup>3</sup> or less. Also, patients must have been receiving antiretroviral drug treatment in Albert Horsfall Medical Center for at least one month. This was to ensure that both short term and long-term hindrances to adherence are assessed and that the participants had some measure of experience with the medications. All adults who are on ART in the facility were to be included due to the relatively small size of the population of study, however eight persons declined participation in the study and three did not attend the ART clinic through out the period of data collection (July – October 2007). A total of 98 persons participated in the study.



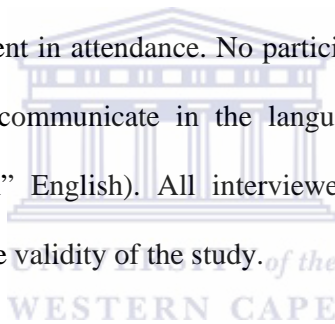
**4.03 Procedure:** Structured interviews using pre-tested 27-question questionnaires were administered to patients receiving ARVs in AHMC. On the same day blood was taken from respondents and forwarded to the laboratory for CD4 count and viral load. The present CD4 count and viral load levels of the participants were used to assess the validity of the self-report adherence levels reported by the participants. Information collected using the questionnaires included the demography of patients receiving ART in the facility, knowledge of the disease and the therapy, estimation of adherence, facilitators and barriers to ART adherence and the desired changes to the ART service from the patient's perspective. Clinical and pharmacy records were reviewed in order to assess adherence and provide other information needed for the further analysis of data.

**4.04 Analysis:** Computer analysis of the data was done using Epi Info 2002 statistical software. In calculating the mean adherence level, the statistical test used was a t-test for a single mean, since we were dealing with one sample. In relating the mean to the

different demographic and operational strata in the study, PLHIV was categorized into adherent and non-adherent groups. Since more than 5 respondents was expected per cell, Chi squared for association (2-by-2 table) was utilized to test for statistical significance. Missing more than one dose in a week was considered non-adherence, irrespective of the drug combination regime of the patient. Most patients are on first line treatment which entails the use of a combination of nevirapine, stavudine and lamivudine; each taken twice a day, and a patient is required to take 14 combined-drug doses in a week. Adherence was defined as taking 13 combined-drug doses (92.85% in take of medications) in a week.

**4.05 Consent:** Consent was obtained by writing to each participant and requesting for participation. Detailed information regarding the study was given in the letter. The attending nurses explained the contents of the letter to each participant during routine clinic days, before handing the letters to participants. For clients who provided informed consent to participate in the study, interviews were scheduled with a trained interviewer. Participants were reassured that participation was voluntary and that refusal would not affect their treatment in the center, and that they had the liberty to withdraw from the research at any time if they so desired. Similarly, such withdrawal would not affect their status as patients in the center. The benefits of the study were explained to them. They were further informed that the true identity of participants and their individual test results will be kept confidential and the report of the study will not reveal the identities of participants. A stipend (fixed amount of money) was given to each participant to assist his or her transportation to the center after the interview following approval of the participant. .

**4.06 Validity/ Reliability & Generalisability:** The strength of the study lies in the triangulation of data collection methods. The use of multiple sources of information should provide corroborative evidence thereby strengthening the validity of the study. All patients on ART in the facility who consented were admitted as participants due to the small sample size of the population of study. Additionally, interviewers received one and a half hours per day training for 5 days, on the conduct of face-to-face interviews. These measures increased the reliability of the study. Medical worker interviewers comprising of two dental nurses, one theatre nurse and a general duty nurse were not involved in the management of these patients in the center so as to minimize information bias. Interviews were conducted in a quiet room with only the interviewer and the respondent in attendance. No participant needed an interpreter as all the interviewers could communicate in the languages spoken by participants (Hausa, English or “pidgin” English). All interviewers were fluent in the three languages. This improved the validity of the study.



Reliability was further enhanced through the pre-testing of the questionnaires to ensure questions are clearly worded and easily understood. Trained interviewers interviewed twelve patients selected from a similar ARV center within Abuja city that is participating in the national antiretroviral program. Selection of respondents for the pretest exercise covered both sexes from 20 to 45 years of age. After the pretest, the questionnaire was discussed by the researcher and the interviewers then amended accordingly. Also, the same interviewers conducted the pre-testing exercise and administered the final questionnaires to research participants. Additionally, double entry of data was done to reduce typing error (two people entered the data using different computers and areas of disagreements were considered and resolved by the

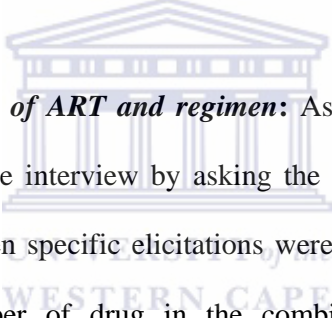
two persons). Outliers were eliminated before the actual analysis of the data using the list command in Epi Info 2002.

Generalizability of data may be limited to other PLHIV within Abuja metropolis receiving free antiretroviral drug therapy under the FMOH program in similar primary health centers. Conditions surrounding clinical care and support may be different in other parts of Nigeria and elsewhere.

**5.00 Results:** The total number of patients on anti-retroviral therapy in Albert Horsfall medical Center is 109 and all were targeted to participate in the study. Of this number, 98 persons consented and participated in the study (response rate of 89.9%). Three of the patients who did not participate did not attend the clinic within the four months period from July to October, when data was collected; and eight eligible persons declined participation for various reasons. Using Epi info 2002 in the analysis of the data, the characteristics of the respondents were computed and the results are as follow:

**5.01 Demographics:** The respondents were all adults with 43.9% of them being male, and 56.1% of them females. The age of the respondents ranges from 21 to 58 years with the average age being 36.6 (SD = 8.2). The majority of men (79.1%) were between 31 and 50 years old while the majority of women (78.2%) were between 21 and 40 years old (Table 1). The average respondent was married (64.9%), had a tertiary education (44.8%), was employed (71.9%) and worked full time (56.90%).

The majority of workers earn between 10,000 and 40,000 Naira (79 to 317 USD) per month (51.4%), while 27.1% earned less than 10,000 Naira per month. 57.7% were head of their household; and of the 42.3% who were not head of their household, 43.9% did not know the salary range of the head of their household; and 31.7% indicated that the head of their household earned between 10-14,000 Naira. Though the majority of them earned poorly, 75.5% indicated that they have never missed their appointment because they could not afford to pay for transportation, while 24.5% had indicated that they had missed a clinic appointment because they could not afford transportation fare to the ARV clinic. Information on socio-demographics obtained during the study has been collapsed into categories and presented in Table 1.



**5.02 Understanding the use of ART and regimen:** Assessing the understanding of regimen was done during the interview by asking the respondents to describe how they take their medicine, then specific elicitations were made to fill in respondents' understanding of the number of drug in the combination therapy, dosages of medicines at initiation of therapy, dosages at the time of interview, knowledge of common side effects and any interaction with food. Each aspect was given a point if answered correctly and the total points were graded into excellent, good, fair, poor and no understanding categories. It was found that 89.6% of the respondents had a good to excellent understanding of the anti-retroviral drug regimen, while 4.2% and 6.2 % had poor and fair understanding of the regimen, respectively. Regarding the use of ARV medicine when used as prescribed by persons who are HIV positive, 87.6% indicated that the therapy reduces the number of HIV in the body; 4.1% believed the drugs cure HIV, while 1.0% believed that the medicine cures TB and 7.2% did not know the effect of ARV on the body.

Table 1: Demographics of patients on ART in AHMC:

Characteristics	Men (n= 43)	Women (n = 55)	Total (n = 98)
	n (%)	n (%)	n (%)
<b>Age</b>			
21 – 30	7 (16.3%)	21 (38.2%)	28 (28.6%)
31 – 40	18 (41.9%)	22 (40%)	40 (40.8%)
41 – 50	16 (37.2%)	10 (18.2%)	26 (26.5%)
51 – 60	2 (4.7%)	2 (3.6%)	4 (4.1%)
<b>Marital status</b>			
Married	31 (72.1%)	32 (59.3%)	63 (64.9%)
Divorced	0 (0%)	5 (9.8%)	5 (5.2%)
Separated	2 (4.7%)	2 (3.7%)	4 (4.1%)
Widowed	1 (2.3%)	7 (13.0%)	8 (8.2%)
Single	9 (20.9%)	8 (14.8%)	17 (17.5%)
<b>Education</b>			
Never	0 (0%)	3 (5.6%)	3 (3.1%)
Primary	5 (11.9%)	3 (5.6%)	8 (8.3%)
Secondary	12 (28.6%)	24 (44.4%)	36 (37.5%)
Tertiary	21 (50%)	22 (40.7%)	43 (44.8%)
Post-graduate	4 (9.5%)	2 (3.7%)	6 (6.2%)
<b>Employment status</b>			
Employed	36 (85.7%)	33 (61.1%)	69 (71.9%)
Not employed	6 (14.3%)	21 (38.1%)	27 (28.1%)
<b>Monthly income</b>			
<10,000	7 (18.4%)	12 (37.5%)	19 (27.1%)
10-40,000	20 (51.6%)	16 (50.1%)	36 (51.4%)
41-80,000	9 (23.7%)	3 (9.4%)	12 (17.1%)
81-160,000	2 (5.3%)	1 (3.1%)	3 (4.3%)

**5.03 Facility service provision:** In assessing the acceptability of the services rendered at the center, respondents were asked whether they would advise a close relative who has tested positive to HIV to enroll for treatment in the center. Most (80.4%) answered that they would, 12.4% said they probably would, while the choice of ‘never’ and ‘probably not’ options contributed 2.1% and 5.2% respectively. Of the 98 respondents, 88.8% had confided their HIV status in another person against 11.2% who had not as of the time of the interview. There was a preponderance of patients who had access to any of the clinic’s staff by phone (61.2%) over those who had no phone access (38.8%). Additionally, 61.9% of those with phone access indicated that it was easy to contact the clinic’s staff, against 28.6% who never had the need to call any member of the clinic. Regarding the stock of anti-retroviral drugs in the facility,

an overwhelming proportion of the participants (93.9%) had never experienced the pharmacy not being able to replenish their stock; and the remaining 6.1 % said the pharmacy rarely run short of anti-retroviral drugs.

Table 2 shows that 74.5% of the respondents did not feel that changes should be effected in the way the clinic is operating presently. The others (25.5%) feel that changes should be made as presented in the following proportions of the total number of participants: 3.1% of the respondents want improved confidentiality, 3.1% seek to increase the number of clinic days, 2% require the clinic to improve its laboratory services, one needed welfare packages to be added to clinical services and 9.2% advocated for improved time management and reduction of patient waiting time.

Table 2: The need for changes in the clinic

Changes in Clinic	Frequency	Percentage	Cum percent	95% C I
Yes	25	25.5%	25.5%	17.2% - 35.3%
No	73	74.5%	100%	64.7% -82.8%
<b>Total</b>	<b>98</b>	<b>100%</b>		

**5.04: Adherence to ARV medication:** The proportion of participants who reported not missing any dose in the past one week was 85.7%, while that of those who missed one dose over the same duration of time was 8.2%. Defining adherence in this study as not missing more than one dose within one week, 93.9% (CI 87.1%, 97.7%) of the participants were adherent.

Table 3: Missed doses

Doses missed in a week (adherence)	Frequency	Percentage	Cumulative percentage	95% CI
------------------------------------	-----------	------------	-----------------------	--------

0 (100%)	84	85.7%	85.7%	77.2% - 92.0%
1 (92.85%)	8	8.2%	93.9%	3.6% - 15.5%
2 (85.72%)	3	3.1%	96.9%	0.6% - 8.75
3 (78.57%)	1	1.0%	98.0%	0.0% - 5.6%
4-14 (71.43 - 0%)	2	2.0%	100%	0.2% - 7.2%
<b>Total</b>	<b>98</b>	<b>100%</b>		

The respondents gave various reasons for missing dose(s). Forgetfulness was the commonest reason given for missing doses (5.1% of all the respondents). The other reasons include ignorance and traveling represented by 2.9% and 4.1% answers from the respondents respectively. The reasons given for remembering to take the drugs regularly were also varied. The most common reason (44.9%) was the use of alarms, cell phones or other time devices; 33.7% believe that they remember to take the medicine because the drugs have become part of them or routine and habit; 16.3% attributed it to sustained social support and education, and 9.2% cue the drug intake with other activities such as meals. A minor proportion (2%) indicated fear of dying as a major reminder to take their drugs.

A univariate analysis of the demographic characteristics in association with adherence level of the research participants using data from the self-report interviews only, has shown that there was high adherence in each category of the different demographic characteristics of the samples namely: gender, marital status, educational status, age category and monthly earnings. Adherence rates for the males and females were 97.7% and 90% respectively, while marital status categories had rates of between 90



and 100%. The characteristics of the sample of study as related to adherence level are summarized in Table 4.

Figure 1: Percentage of adherent & Non-adherent in the sample.

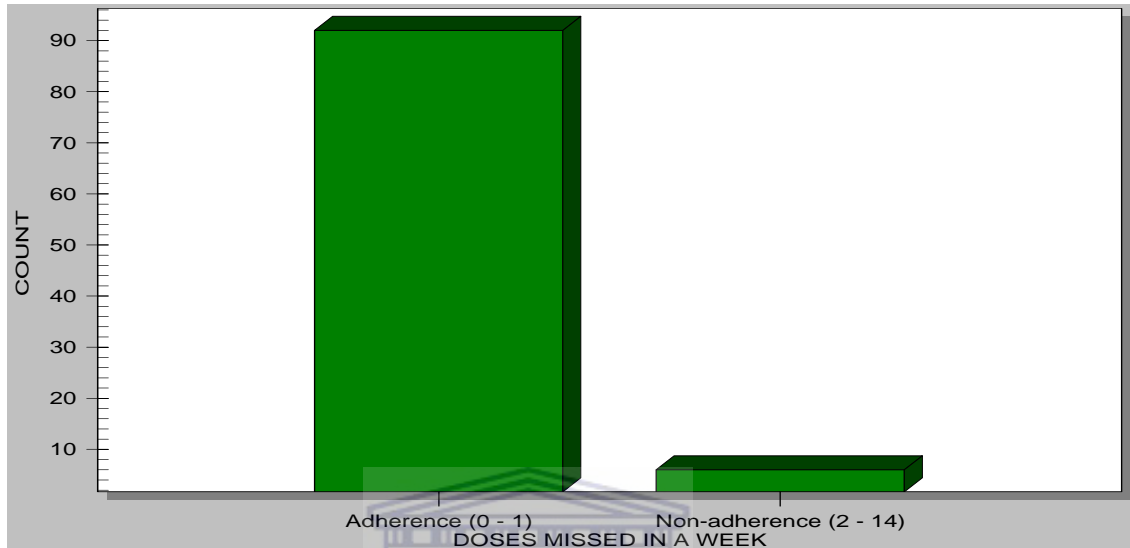


Table 4 Associations of socio-demographics with adherence:

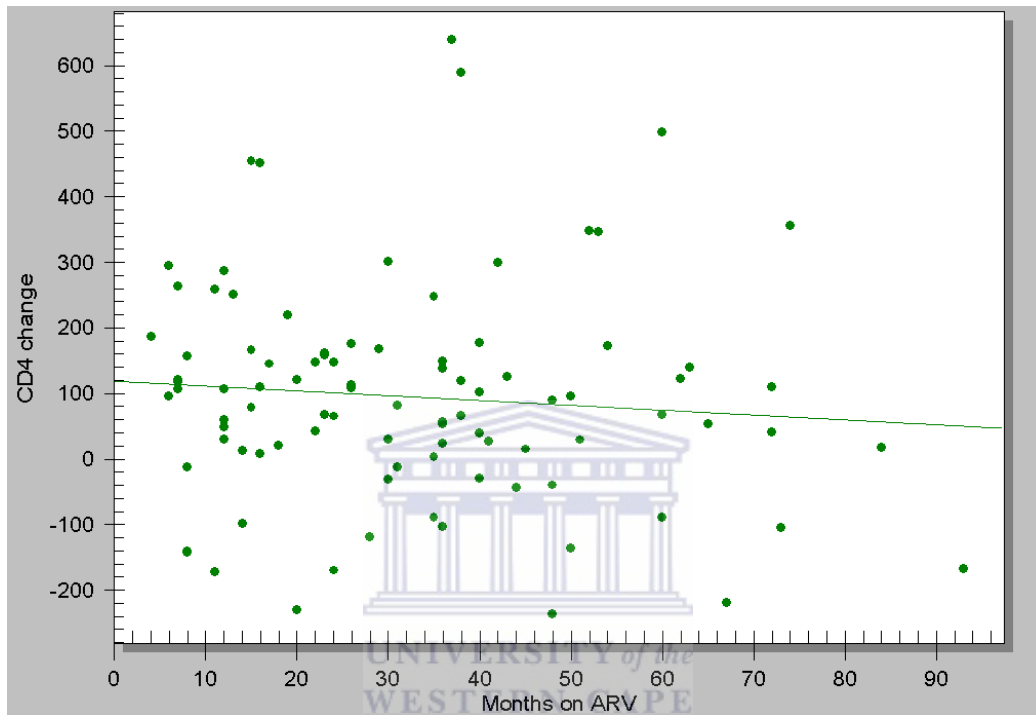
Characteristics	Adherence 0 – 1 misses/wk n (%)	Non-adherence 2 – 14 misses/wk n (%)	Total N	Probability
<b>Gender</b>				Fisher's exact 2-tailed
Male	42 (97.9%)	1 (2.3%)	43	0.23
Female	50 (90%)	5 (9.1%)	55	
<b>Age</b>				Chi square linear trend 1.386
21 – 30	26 (92%)	2 (7.1%)	28	P = 0.24
31 – 40	36 (90%)	4 (10%)	40	
41 – 50	26 (100%)	0 (0%)	26	
51 - 60	4 (100%)	0 (0%)	4	
<b>Marital status</b>				Fisher's exact for 2-tailed Married vs Not married
Married	59 (93.7%)	4 (6.3%)	63	P = 1.0
Not married	32 (94.1%)	2 (5.9%)	34	
Divorced	4 (80%)	1 (20%)	5	
Separated	4 (100%)	0 (0%)	4	
Widowed	8 (100%)	0 (0%)	8	

Single	16 (94.1%)	1 (5.9%)	17	
<b>Education</b>				
Never	3 (100%)	0 (0.0%)	3	Chi square linear trend 0.372 P = 0.54
Primary	7 (87.5%)	1(12.5%)	8	
Secondary	34 (94.1%)	2 (5.6%)	36	
Tertiary	41(95.3%)	2 (4.7%)	43	
Post-graduate	6 (100%)	0 (0.%)	6	
<b>Employment</b>				
Employed	66 (97.7)	3 (4.3%)	69	Fisher's exact 2-tailed 0.39
Not employed	24 (88.9)	3(11.1%)	27	
<b>Monthly</b>				
<10,000	18 (94.7%)	1 (5.3%)	19	Chi square linear trend 0.608 P = 0.44
10-40,000	35 (97.2%)	1(2.8%)	36	
41-80,000	12 (100%)	0 (0.%)	12	
81- 160,000	2 (66%)	1(33%)	3	

At initiation of therapy, records have shown that the CD4 count ranges from 14 to 520 cells/ml. The average CD4 of participants was 206.2, the median at 196.5 (SD = 100.86). The present CD4 count has a range of 22 to 859; with the mean and median being 301.2 (SD =164.6) and 266 respectively. The mean and the mode for the number of months respondents have been on anti-retroviral drugs are 32.6 months and 30 months respectively. Duration of intake of drugs ranges from 1 to 93 months. Though there appears to be improvement between the median values of the initial and the present CD4 counts, a scatter plot graph of the change of CD4 counts from the baseline and the months on ARV in Figure 3 indicates a negative gradient. Tabulating the adherence status of respondents against CD4 in categories, the percentage of persons with CD4 count above 250 were 56.7% and 50% for the adherent and non-adherent group respectively; only minimal difference noted. Though no person in the non-adherent group had a CD4 count within the range between 501- 1000, 50% in the

non-adherent group had CD4 count within the range of 251 – 500 against 45.6% for those that reported adherence to antiretroviral medicines.

Figure 2: Scatter Plot of CD4 change from baseline and Months on ARV



The results of viral load tests indicated that 93 results were valid and 5 invalid. 14% of the respondents had undetectable viral load count, while 86% had copies of viruses detected in their blood. Comparing respondents' adherence status with their viral load status using 2 X 2 table, only 13% in the adherence group had undetectable viral load and 86.4% in the same group had viruses detected in their blood (OR = 0.6316, Fisher exact 0.5374). Therefore the viral load did not validate the adherence rate of 93.9% as reported by the respondents.

**5.05 Review of medical records:** Albert Horsfall Medical Center started ART fully in January 2002 as part of the Federal Ministry of Health national anti-retroviral treatment program. The total number of patients registered in the center at the time of review was 162. A review of the registration book indicated that, of this number, 79 are female, 84 are male, 10 (8 men and 2 females) are deceased, 3 were confirmed to have been transferred to another ARV center, and 4 persons were reported to have absconded. As the center caters for only adults, all pediatric patients are referred to other centers with pediatric antiretroviral therapy program within Abuja city.

At present, the center runs its ARV clinic one day per week (specifically on Thursdays), while collection of medications; laboratory investigation and counseling services can be accessed by clients throughout the weekdays. On the clinic days, each patient goes through general counseling; clinical assessment and care; collection of drugs and adherence counseling; before getting an appointment for the next visit. Staff members involved in the ART clinic include the head of the program, three doctors, five nurse counselors, two pharmacists and one laboratory scientist. There is no health information manager or a specific person charged with this responsibility; and the above staff members are also involved in other activities necessary for the day-to-day running of the center.

From the initial 25 slots in 2002, the number of patients on antiretroviral drugs has grown gradually to 109 as of the time of this report. Review of the pharmacy log book over a period covering the last nine months revealed that 32 of the 109 patients (29.4%) had delayed or had not collected their drugs in the month of October 2007.

Similarly 41 of the 109 persons (37.6%) have failed or delayed to collect their medications at least once in the past nine months.

## **6.00 DISCUSSION:**

**6.01 Frequency of adherent respondents:** The frequency of self-report adherence of the respondents to anti-retroviral drugs in this study is comparable to previous adherence studies carried out in Sub-Saharan Africa that equally demonstrated exceptionally high adherence rates. Laniece, Ciss, Desdaux et al (2003) reported a mean adherence of 91% following an observational cohort study in Senegal. An equally high frequency of adherence of 93.5% was reported in the CTAC (Cape Town AIDS Cohort) study at 48 weeks medication (Orrell, Bangsberg, & Wood, 2003).

High adherence among the respondents in this study may be due to the over reporting inherent in self-report questionnaires as a method of data collection. There may have been some element of information bias, since the collection of data was done within the facility, even though by trained nurses who are not members of the ARV team in the facility. The cross-sectional study design using a self-report method of data collection may not be responsible for the high adherence recorded in AHMC as a similar research setting had recorded only 54% adherence among respondents in Botswana (Weisser, Wolf, Bangsberg et al, 2003). Nevertheless, in that study, removal of cost of ARV medications using logistic regression increased the predicted adherence from 54% to 74%. In AHMC, the drugs are free, therefore cost is not an issue when considering adherence. Free drug provision may be a major factor affecting adherence. Most patients could not afford to buy these medications on a consistent basis.

It may also be argued that there was a sample bias because the eight people that declined participation and the three that did not show up during the data collection may all be non-adherent patients. Addition of assumed non-adherent respondents (eleven in number) to the non-adherent group would bring the frequency of adherence to 84.4%; which is still an appreciable level of adherence.

The frequency of self-adherence adherence (93.9%, CI 87.1 - 97.7%) could not be easily validated with the CD4 count increase following the initiation of antiretroviral drugs as different respondents had different durations of time on the medications. Although as expected, the mean CD4 count had increased from 206.2 cells/ml for the initial CD4 count before therapy initiation to 301.2 cell/ml at the present; the graph plotting months on ARV against present CD4 count change from baseline in Figure 3 shows a resultant negative gradient. Possible explanations are the presence of resistant HIV to the first line drugs which the majority of the respondents are taking, high presence of co-morbid conditions or there is an over report of adherence in the study. Additionally, information from the pharmacy log has shown that over a period of nine months review, 37.6% of persons on ARV drugs delayed or failed to pick up their drugs when due; and in the month of October, 20.4% failed to pick up their drugs on time. This clearly points to the possibility of over reporting of adherence in the study, assuming that records in the pharmacy logbook are accurate. Viral load would be an appropriate biological measure to validate adherence barring the presence of virus resistant to ARV medications in use in the facility. Only 13% of the respondents had undetected viral load level despite a high self-report adherence rate by the majority of the respondents. On further analysis, only 13.6% of those who reported adherent had viral load below the level of detection in their blood. This further gave the impression

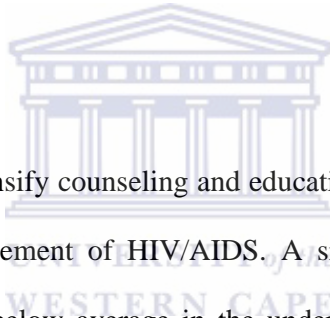
of high self-report. Assuming that there was no overestimated self-report of adherence, then there may be high resistance to one or more of the first line antiretroviral medications in use.

***6.02 Association of adherence with demographic characteristics of the respondents:***

The frequency of adherence to ARV drugs was high in each category of the different socio-demographic characteristics in the sample of study. The characteristics of the respondents considered in the study are gender, marital status, education, employment status, monthly earnings and age. No categories of age, marital status, educational status and monthly earnings had statistically significant associations with adherence among the respondents. Several other studies found that no demographic characteristic was predictive of adherence (Patterson et al, 2000; Bersch, 1999; Orrell et al, 2003 & Laniece et al, 2003). A few studies, however, have found that some demographics were predictive of adherence. Sign et al (1999) noted that non-whites were less likely to adhere to ARV drugs regimen than whites in USA, while Pinheiro et al (2002) and Monreal et al (2002), found education to be predictive of adherence in Brazil.

***6.03 Service provision:*** The respondents appear pleased with the performance of facility in terms of the services rendered. 80.4% of respondents indicated that they would definitely advise a close relative to enroll in the clinic if tested positive for HIV and 12.4% agreed they would probably do the same. Furthermore, 74.5% of respondents did not feel that changes should be made in the way the clinic is operating. It should also brought to the fore that 89% of the patients had good to excellent understanding of the regimen, and 87.6% of the respondents had a good

understanding of the effect of antiretroviral drugs on the body when used by HIV positive persons. Also, the performance of the pharmacy department was rated very high - 93% of the respondents indicated that the pharmacy has never run short of medicine or delayed the replenishment of their stock of drugs, while 6% indicated that they rarely experience out of stock in their dealings with the pharmacy. These are indicators of patients' satisfaction in the running of the clinic. However, information bias cannot be ruled out as the reason for such acceptability of the clinic's performance. It is true that until the recent expansion of services, getting enrolled in the government's national ARV program used to be difficult due to the fact that institutions were given slots they should not exceed, and these slots were gradually increased.



There may be a need to intensify counseling and education of patients on some of the issues related to the management of HIV/AIDS. A situation where 14.6% of the respondents were assessed below average in the understanding of the regimen and 12.6% did not know the use of the antiretroviral drugs needs to be corrected. In this regard, it is necessary for the staff of the ART clinic to embark on continuous education especially for counselors to enhance their present performance. Though 44.9% use time devices to remind them to take their medications and 93.9% of the respondents consider themselves adherent to medications, there is a need to introduce more measures to aid adherence. Some of the pertinent changes that the respondents desired should be looked into and, where possible, meaningful changes should be made to improve confidentiality, increase clinic days, improve the laboratory services and reduce patient waiting time thereby improving on time management, in the running of the clinic. It is also important to improve on the phone access to the staff of



the clinic by making it mandatory that patients own a copy of a printout containing the phone numbers of some of the key staff members of the clinic. At present only 62.2% have the phone number of at least one member of staff.

### **7.0 Limitations of the study:**

1. Self-report (SR) was chosen because of its simplicity. SR has inherent ability to overestimate compliance. Some authorities however believe that with careful wording of the questions in a specific and nonjudgmental manner, its accuracy can be increased. We strived to achieve high accuracy in the formulation and administration of the questionnaires during the study. Nevertheless, overestimation of adherence may have occurred because the data collection was done within the facility.
2. Secondly, records of patients were not well organized; hence extracting needed data was difficult and time consuming. This was not surprising, as no person has been trained specifically to manage data in the ART clinic.
3. Results obtained are only applicable to the ART clinic in Albert Horsfall Medical Center and similar primary health centers in Abuja engaged in the provision of antiretroviral drug therapy under the national ARV program.

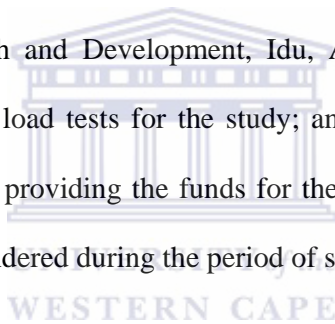
### **8.0 Conclusion/Recommendations:**

1. The frequency of self-report adherence among patients receiving antiretroviral therapy in Albert Horsfall Medical Center is high (93.9%, 95% CI 87.1 – 97.9). However, only a few patients attained the level of undetected viral load.
2. Demographic factors were not associated with adherence in the study.

3. Patients were generally satisfied with the performance of the clinic. However, they observed that there is a need for changes to be made in the running of the clinic so as to address problems of confidentiality, time management and patient waiting time. They considered it necessary that the laboratory services should be improved; and additionally, the number of clinic days should be increased from the present one day per week.
4. The following additional recommendations are made in order to improve the running of the clinic;
  - Counselors in the ARV team should have continuous education in adherence counseling
  - Counseling for adherence should be intensified and must become a routine during drug collection and general counseling sessions. A drug adherence strategy should be developed for the clinic.
  - Health information manager should be employed or the clerk of clinic trained to take full responsibility of management of records in the ART clinic.
  - Laboratory services should be improved to be able to carry out all the basic tests necessary for good follow up of patients including CD4 count, which at present is conducted with the cost borne by patients outside the facility.
  - A conscious effort should be made to address some of the concerns raised by the respondents above, where feasible. The report of this research will be brought to the notice of the Director of medical services and the Head of the ARV team.

- There is a need for a more comprehensive study of adherence and the ARV resistance profile in the Abuja metropolis as the national program is expanding. In this regard, the Ministry of Health in Federal Capital Development Authority should be informed of the outcome of the study in writing with a suggestion to partner with other agencies to carry out the a wider study.

**9.0 Acknowledgment:** My sincere appreciation goes to my supervisor, Prof H. Hausler for his patience and guidance throughout the entire study. I wish to also thank the Director and the entire staff the Human Virology laboratory of National Institute for Pharmaceutical Research and Development, Idu, Abuja for their assistance in carrying out CD4 and viral load tests for the study; and the management of Albert Horsfall Medical Center for providing the funds for the study and the entire staff of the center, all the support rendered during the period of study.



Annex 1: Questionnaire

QUESTIONNAIRE

ON

**COMPLIANCE ARV: Albert Horsfall Medical Center**

*(All missing data will be coded 99, and non-response 88, other answers as coded)*

1. Questionnaire Number .....
2. Gender:
  - male 1
  - female 2
3. How old were you on your last birthday? State in years.....
4. What is your marital status? Choose the most appropriate answer
  - married 1
  - divorced 2
  - separated 3
  - widowed 4
  - single 5
  - cohabiting 6

5. what is the total number of years you have spent schooling including primary school period? Choose the most appropriate answer

- never been to school 1
- 6 years & below (primary) 2
- 7 to 12 years (secondary) 3
- 13 to 16 years (tertiary) 4
- above 15 years (postgraduate) 5

6. Are you in any kind of employment? Please choose one answer.

- no 0
- yes 1

(If no, Skip 7 & 8)

7. In the place of work that is the main source of your income, what is your employment status? Please choose one of the answers below:

- full time employee 1
- part time employee 2
- volunteer 3
- contract staff 4
- self employed 5
- others specify:.....6

8. What is your total estimated average monthly earning? Please choose most applicable answer below

- below 10,000 Naira 1
- 10,000 to 40,000 Naira 2
- 41,000 to 80,000 Naira 3
- 81,000 to 160,000 Naira 4
- 161,000 and above Naira 5

9a. Are you the head of the household? Please answer yes or no:

- No 0
- Yes 1

**(Skip 9b if the answer is yes)**

9b. What is the salary of the head of the household? Please choose from the answers below the most appropriate:

- below 10,000 Naira 1
- 10,000 to 40,000 Naira 2
- 41,000 to 80,000 Naira 3
- 81,000 to 160,000 Naira 4
- 161,000 and above 5

10. How long have you been on antiretroviral therapy? State in months.....

11. Have you confided your HIV status result in anybody? Please answer yes or no

- No 0
- Yes 1

12. Of what use are antiretroviral medicines to the body, when used by people living with HIV as prescribed? Choose one answer please.

- the medications are used to cure HIV infection 1
- the medications cure TB 2
- the medications reduces the number of HIV in the body 3
- do not know 4

14. Describe how you take different ARV medications in line with the pharmacist's instructions?

*(Interviewers to elicit further on the number of the different tablets per dose at initiation of therapy and at present, the number of times the respondents take the each medication per day, the common side effects and interaction with food)*

***(The interviewer will assess the respondents and then mark below the best suited for the respondent's answer. The different tablets may be shown to patients' to aid understanding)***

- no understanding of the regimen 1
- poor understanding of the regimen 2
- fair understanding of the regimen 3
- good understanding of the regimen 4
- excellent understanding of regimen 5

15. How many doses of the medication have you missed?

- (a) in the past 3 days .....
- (b) In the last week.....
- (c) In the last month. ....

16 .Why did you miss doses?

.....  
.....  
.....  
.....  
.....

17. What helps you to remember to take your ARV medications?

.....  
.....  
.....  
.....

18. Do you feel healthier on or off HIV medications? Choose one answer below:

- on 1
- off 2
- don't know 3

19. When dispensing ARV medications to you, how often does the dispensing pharmacy staff advise you (in words) on the medications? Please choose one answer:

- never advised verbally 1
- occasionally 2
- most of the time 3
- every time 4

20. Do you have access to any of the staff in the ARV clinic using the phone?

- No 0
- Yes 1

*(If No, skip 21)*

21. How easy is it to contact an appropriate member of staff of the center by phone, in order to seek advice on ARV medications or fix an appointment? Please choose one answer.

- Easy 1
- Fairly easy 2
- Difficult 3
- never had a need to call 4

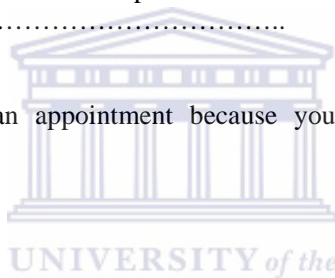
22. Does the pharmacy run short of ARV medicine and thereby delay the refill of your medications at any time since you got enrolled in the program? Please answer yes or no:

- No 0
- Rarely 1
- sometimes 2
- often 3
- very often 4

23. *(If 1 - 4)* How many times within the past 6 months has the pharmacy ran short of anti retroviral medications? .....

24. Have you ever missed an appointment because you could not afford to pay for transportation?

- yes 1
- no 2



25. Regarding the way the clinic is conducted, would you advise a close relative who has tested positive to HIV to get enrolled in the same center you are attending? Choose one answer below:

- definitely 1
- probably 2
- probably not 3
- never 4

26. Do you feel that changes should be made in the way the ART clinic is carried out at present?

- no 0
- yes 1

27. (If yes), List 5 changes that should be made in order of their importance

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Interviewer & Date

<p>TO BE FILLED BY THE RESEARCHER</p> <p>28 Present CD4 count:</p> <p>29 CD4 count at initiation of ART:</p> <p>30 Was the first 6<sup>th</sup> Month CD4 count documented within a period covering a week before or a week after?</p> <p>    <input type="checkbox"/> no</p> <p>    <input type="checkbox"/> yes</p> <p>31. Viral load:</p> <p>32 HAART combination: ....., .....</p>
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INFORMATION SHEET

**AN ASSESSMENT OF ADHERENCE TO HIGHLY ACTIVE ANTIRETROVIRAL THERAPY IN  
ALBERT HORSFALL MEDICAL CENTER: AN ART CENTER IN ABUJA, NIGERIA**

This is a study of antiretroviral therapy in Albert Horsfall Medical Center, a primary health medical facility located in the Federal Capital City (FCT) – Abuja, Nigeria. This facility is one of the first government owned institution that provides antiretroviral therapy to people living with HIV under the federal government national antiretroviral therapy program that started in 2002.

The purpose of the study is to provide a good understanding of the ART service as provided by Albert Horsfall Medical Center as part of the national program in order that recommendations for the improvement of the services rendered in the center be profered. Data will be collected through interviews of people living with HIV (PLHIV) receiving antiretroviral treatment in the facility. Similarly, measure of CD4 count (a routine blood test that estimates the level of immunity) will be performed on each participant PLHIV. The cost of the tests done on participants will be part of the research cost and therefore not borne by the participant. Additionally, the documents of the clinical and pharmacy records of service will be reviewed by the researcher.

Interviews are to be conducted on one-to-one basis and will arranged after seeking written consent from participants and participation in the study is voluntary. Please note that refusal to participate in this research will not in anyway affect participants status as patients in AHMC; and each participant is free to withdraw from the research at anypoint. It important that participants will be made to understand that their actual identity will be kept confidential and that any report emanating from the research will be made in such way that the data cannot be traced to the participants.

Finally, please be informed that the study is a course requirement for the award of Masters in Public Health (MPh) to the researcher by the university of the Western Cape, South Africa. Your kind cooperation is therfore humbly solicited to enable the student researcher complete his work in good time. Do feel free to contact the reseacher by phone or by e-mail for further clarifications or querries regarding the research project. The telephone number and the e-mail address are provided below.

Thank y\_ou for your time and cooperation.

---

C. AKPABIO (DR)  
Student researcher  
Telephone: +234-8029579827  
e-mail: [akpabiodot@yahoo.co.uk](mailto:akpabiodot@yahoo.co.uk)



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**CONSENT LETTER**

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Date:

Researcher (Student): Charles Akpabio (DR)  
UWC Student No: 2402693  
Telephone: +234 9 5236036, mobile: +234 8029579827 , Fax:  
e-mail: [akpabiodot@yahoo.co.uk](mailto:akpabiodot@yahoo.co.uk)

Institution: ALBERT HORSFALL MEDICAL CENTER

Addressed to :

Place of Interview:

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Thank you for accepting to participate in the study. I wish to bring your understanding the purpose and the process of the study.

I am a Masters in Public Health student in the University of the Western Cape, South Africa. As part of the course, I am conducting a study of Antiretroviral Drug Therapy (ART) in Albert Horsfall Medical Center (AHMC), Abuja, Nigeria. I can be contacted in AHMC. My telephone number is (+ 234(0) 8029579827), and my e-mail address is [akpabiodot@yahoo.co.uk](mailto:akpabiodot@yahoo.co.uk)

2. Purpose & Contents of Study: You will be involved in an interview to be conducted for the purpose of understanding the ART program in AHMC, from the participants point of view. Data collected from these events will be processed to make recommendations for the improvement of the antiretroviral therapy program in the center. Your discussions will cover the understanding of the HIV disease, the process of receiving the treatment and suggestions on how to improve the program.

3. Interview process: The interview will consist of a one-to-one question and answer session with an interviewer using a standardized questionnaire. The time and venue of the interview will be arranged with you. Also, blood will be obtained from you for CD4 count and viral load; tests used in monitoring the body's immunity periodically when one is on antiretroviral medications.

4. Anonymity of contributors: All sources of information during the exercise will be kept confidential and you will be referred to during the entire exercise in your chosen invented name as recorded above. I will keep records of participation locked up and will subsequently destroy them after the data has been extracted.

5. Things that may affect your willingness to participate: Discussions will be centered on HIV infection and its treatment. If you prefer not to answer any question during the interview, there will no negative consequences to you. Please be reminded that you are at liberty to withdraw your participation without any adverse consequences to you and your treatment in the center will not be affected.

6. Agreement:

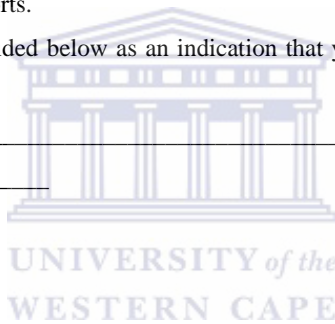
6.1 Please note that acceptance to be interviewed will indicate your consent.

6.2 Researchers agreement: Your true identity will be kept confidential at all times. The contents of the interview and discussions will be used for data collection as earlier mentioned, however such data may be used for published or unpublished research at a further date without further consent. Your identity will never be disclosed in any reports.

6.3 Kindly sign in the space provided below as an indication that you willingly wish to participate in the study please.

Name of the participant: \_\_\_\_\_

Signature: \_\_\_\_\_



Thank you!

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Charles Akpabio (Dr)

Date:

Place:

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