

**RATIONAL PRESCRIBING OF ARVS AMONG PREGNANT HIV WOMEN
ATTENDING SELECTED HEALTH INSTITUTIONS, IN BUSHENYI
DISTRICT, UGANDA**

**BY
KEVIN KARIUKI
BPH/8367/51/DF**

**A RESEARCH REPORT SUBMITTED TO THE SCHOOL OF PHARMACY
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**SUPERVISOR
MR. JOSEPH EZEONWUMELU**

APRIL, 2010.

DECLARATION

KEVIN KARIUKI, hereby declare that this research is my own work and has not been submitted either in the same or different form for any academic qualification.

Signature.....*Kariuki*.....

Date.....*4/2010*.....

SUPERVISOR

Signature.....*[Handwritten Signature]*.....

Date.....*21/07/2010*.....

DECLARATION

KEVIN KARIUKI, hereby declare that this research is my own work and has not been submitted either in the same or different form for any academic qualification.

Signature.....

Date.....

DEDICATION.

To my parents, brother and colleagues for their unconditional love and endless support. Thank you all.

ACKNOWLEDGEMENT

My most sincere gratitude goes to my Family members for their financial support, which made this report success. More gratitude goes to my supervisor Mr. Joseph Ezeonwumelu for his dedication and intellectual assistance throughout my studies.

ABSTRACT.

Irrational prescribing of ARVs to HIV pregnant women is a major problem of poor control of HIV/AIDS all over the world. The researcher assessed the rational prescribing of ARVs and identified factors which contribute to poor prescribing skills and adherence to the National guidelines.

A retrospective cross sectional approach was used in studying a sample of pregnant HIV women attending different health institutions in Bushenyi District as from 1st January 2008 to 31st December 2009.

The study revealed that actually 61% of the prescribers adhered to the National guidelines of Antiretroviral therapy.

Rational prescribing of ARVs is an important factor in the effective treatment and control strategy of HIV/AIDS.

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CHAPTER ONE

1.0 INTRODUCTION

1.1 Background of the Problem

Irrational prescribing of ARVs is a major problem of poor control of HIV/AIDS all over the world. WHO estimates that more than half of all medicines are prescribed, dispensed or sold inappropriately, and that half of all patients fail to take them correctly. This results in wastage of scarce resources and widespread health hazards.

The researcher assessed the rational prescribing of ARVs and identified factors which contribute to poor treatment and factors affecting the use of antiretroviral therapy by HIV/AIDS patients in Bushenyi District, Uganda.

The Human Immunodeficiency Virus (HIV) is an RNA retrovirus existing in two forms: HIV-1, which is the commonest cause of infections, while HIV-2 is confined in certain parts of West Africa.

HIV infection is transmitted through:

- Sexual contact
- Inoculation with infected blood products
- Use of contaminated needles
- Vertical transmission from mother to child.

Infection with HIV-1 results in progressive destruction of the CD4 T-cell, a decline determines the rate of immunodeficiency and subsequent development of HIV

related opportunistic infections. The destruction of T-cells is done mainly to activate viral replication.

Using the average time taken for development of acquired immunodeficiency syndrome (AIDS) following HIV infection, people can be broadly categorized as follows:

- 'Average developer' who develops AIDS within approximately 10 years.
- The rapid developer (approx 20% of all cases) who develops AIDS within 5 years following infection.
- The slow developers (approximately 5% of all cases) who remain asymptomatic for over 10 years without a significant decline in CD4 T-cell count

The majority of people infected with HIV in the developing world have no access to the antiretroviral treatment. Access to antiretroviral treatment must be seen from a more comprehensive outlook of total continuation of care of HIV/AIDS patients. The Ugandan health worker has an obligation to provide care, which should be continuous starting from the hospital to the community. There should be active participation of doctors, volunteers, nurses, patients and their relatives. Education programmes for physicians and general practitioners committed to HIV/AIDS care aim at avoiding unnecessary or inadequate therapeutic prescriptions.

Laboratory monitoring including HIV, RNA, CD4 T-cell counts and clinical assessment on early diagnosis, choice of combination of antiretroviral

management of acute HIV/AIDS, HIV/AIDS infects pregnant women and children, post exposure prophylaxis and structures interrupted treatments are indicated. It is meant to serve as a guide to antiretroviral treatment and we anticipate that these guidelines will trigger development of innovative approaches to better management of patients with HIV/AIDS in Bushenyi District.

1.2 Problem Statement

Most government hospitals are not in full capacities to carry out screening of all patients suspected to be having HIV/AIDS. Most patients with HIV/AIDS are failing to get clear education about the effective use of antiretroviral drugs and they do not have easy and direct access to antiretroviral medications despite the government's effort to install the services at almost all hospitals.

Most hospitals do not have enough qualified physicians and practitioners committed to HIV/AIDS care in hospitals and the community at large. All these result to poor patient's care.

1.3 Purpose of the study

The purpose of this study was to assess the attitudes of prescribers towards prescribing of antiretrovirals for HIV/AIDS patients in a resource poor setting.

1.4 Objectives of the Study

- To determine the level of adherence by prescribers to guidelines used in prescribing antiretroviral therapy for HIV pregnant women.

- To assess the factors which affect the prescribing attitudes of prescribers of antiretroviral therapy to HIV pregnant women.

1.5 Justification of the Study

The information generated would be of great value to the health institutions in Bushenyi District, in educating HIV/AIDS patients and health professionals on the importance of rational prescribing and use of antiretroviral therapy among the infected individuals.

The findings would indicate a way forward in the designing of health educational programs to create more awareness on antiretroviral therapy and its rational use.

1.6 Acronyms and abbreviations

ABC - Abacavir

ADH- Adherence

AIDS - Acquired Immuno-Deficiency Syndrome

APV - Amprenavir

ART - Antiretroviral Therapy

ARVs - Antiretroviral drugs

ATV - Atazanavir

CTX Cotrimoxazole (trimethoprim-sulfamethoxazole)

d4T – Stavudine

ddC – Zalcitabine

ddl – Didanosine

DLV - Delavirdine

EFV – Efavirenz

FTC – Emtricitabine

HAART - Highly Active Antiretroviral Therapy

IDV - Indinavir

LPV/r - Lopinavir-ritonavir

MoH - Ministry of Health

MTCT - Mother-To-Child Transmission (of HIV)

NFV - Nelfinavir

NNRTIs - Non-Nucleoside Reverse Transcriptase Inhibitors

NsRTIs - Nucleoside Reverse Transcriptase Inhibitors

NtRTI - Nucleotide Reverse Transcriptase Inhibitor

NVP- Nevirapine

TADH- Total adherence

TNADH- total non adherence

3TC - Lamivudine

CHAPTER TWO

2.0 LITERATURE REVIEW

The term antiretroviral drugs means the medication given to people with viral infection more especially HIV/AIDS and which aims at reducing viral replication hence lowered plasma load to undetectable levels.

Dr. Lwegaba Anthony discovered the first HIV case in Uganda in 1982, then working as a medical officer at Kalisizo Health center, Rakai district. Now, twenty six years later, HIV is the commonest cause of death among the young adults aged 20-45 years. Although the overall HIV prevalence has been reduced from over 18% of the early nineties to below 7%, it is estimated that over one million people (including about 100,000 children under 15 years) are currently infected and, probably a million have already died from HIV. Over the last 28 years, the MOH in collaboration with local and international partners established a care program for HIV infected people. In the past five years, the program integrated antiretroviral therapy (ART) into the comprehensive response to HIV prevention, care and support. Currently, 110,000 out of the 300,000 patients estimated to be in need of ART are already accessing it. This has been possible through initiatives such as the World Health Organization (WHO), the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM) and the United States President's Emergency Plan for AIDS Relief (PEPFAR).

According to the (KENYA GUIDELINES TO ANTIRETROVIRAL DRUGS THERAPY) publication, it stated that the mainstay of managing HIV/AIDS epidemic is prevention an advocacy for behavior change. In (UGANDA NATIONAL ANTIRETROVIRAL TREATMENT AND CARE GUIDELINES FOR ADULTS AND CHILDREN) the November 2003 publication, it is clearly stipulated that although ARVs do not cure HIV infection, evidence from clinical trials from various countries has shown that;

- They reduce mortality and morbidity.
- They reduce the incidence of opportunistic infections and other AIDS related illness by delaying HIV disease progression.
- They improve the quality of life.
- They increase the life expectancy of people living with HIV/AIDS.

It is still insisted that proper use of antiretroviral drugs and monitoring will require capacity building of the staff hence need for standard treatment for providing the highest quality and the most cost effective healthcare. Through publication of antiretroviral drug therapy guidelines, the ministry is established standard regimens for antiretroviral drug use by patients.

In the policy for (REDUCTION OF MOTHER TO CHILD HIV TRANSMISSION IN UGANDA) May 2003 publication shows how various health workers are involved in the implementation of antiretroviral treatment in pregnancy. The health workers trained include;

- Counselors and senior workers.

- Doctors, midwives and nurses in antenatal clinic, obstetric wards, labour wards, post natal wards and family planning clinics.
- Laboratory workers and other auxiliary staff.
- Pharmacy and records staff.

On the other side a considerate collective effort of senior clinicians from the ministry of health, medical institutions and private hospitals is vital collaboration of the governmental and non-governmental agencies and other developmental parties are involved. Among them UNAIDS, WHO, centers for disease control and prevention (CDC) and USAID. The national AIDS control council provides the required multisectoral co-ordination to ensure there is a breakthrough.

According to the (UGANDA NATIONAL ANTIRETROVIRAL USE GUIDELINES, **2008**), it is stated that the decision to start therapy should be made after considering the patients' acceptance or readiness and probability of adherence. The strength of recommendation is dependent on the prognosis as determined by clinical state, CD4 cell count and viral burden. Patients are also taught about the risks and benefit of delayed initiation of therapy and of early therapy in the asymptomatic HIV infected patients.

About the antiretroviral profile, patients are taught about all the drugs available and the most appropriate combination needed. In these they are taught about HAART (highly active antiretroviral therapy) which is a combination of three or more ARVs in the treatment of HIV infected individuals. These drugs are classified into;

- Nucleoside reverse transcriptase inhibitors.
- Non-nucleoside reverse transcriptase inhibitors.
- Protease inhibitors.
- Fusion inhibitors.

Their knowledge on how they work and their effect in the body is given to the patient before the best combination is chosen. Most combination considered includes;

- 2 nucleoside RTIs + protease inhibitor, NNRTIs sparing
- 2 nucleoside RTIs + non-nucleoside RTI, PI sparing.
- 3 nucleoside RTIs, NNRTIs and PI sparing

According to the (GUIDELINE TO THE ANTIRETROVIRAL DRUGS IN KENYA), December 2002 publication it is revealed that there are marked age dependent differences in the profile of T lymphocytes subjects in children. In infancy, CD 4 cell counts are generally higher than adult levels by the age of 6 years. Infants with CD 4 percentages of 15-20% are considered moderately immune suppressed and those with percentages less than 15% are considered severely immune suppressed. In (UGANDA THERAPY GUIDELINE), experience and expertise in counseling children is seen growing but is still limited. Data on the efficacy of ARVs in adults can generally be extrapolated to children but issues of pharmacokinetics, formulations and ease of administration require special consideration.

According to the (AIDS IN AFRICA), a manual for physicians' suggests that several parts of Africa there's a widely variable perinatal infection rate (20-60%) among children born to HIV-seropositive mothers. In areas where women between 20 and 29 years of age had high HIV seroprevalence rates, an important proportion of children who could already have been infected with the virus at birth or acquired infection during or shortly after birth. Since then the paediatric AIDS was increasingly being recognized as an important public health problem in Africa. Studies also showed that mother to child transmission also occurred through breastfeeding. Due to the above mentioned reasons a guideline was set to introduce antiretroviral therapy to pregnant mothers which could have the following benefits:-

- It reduces the mother to child transmission of HIV infection
- It reduces the cost of caring for an HIV positive infant to the health care system and the family structure.
- It reduces the number of HIV infected infants and thus the burden they impact on time commitment, energy and resource of caretakers.

From 1991-1995 epidemiological study at Mulago it was found out that vertical transmission rate is 27.5% without any intervention, this means about 20000 of the 67000 babies of HIV infected mothers in a year are infected. Due to that reason a UGANDAN NATIONAL GUIDELINE ON PMTCT was published. In this publication mothers are also taught the

importance of attending VCT during pregnancy. Information on factors affecting MTCT is also made available for the mothers. These include:-

- High viral load
- Maternal advanced disease during pregnancy or breast-feeding period
- Vaginal delivery or rupture of membrane
- Breast-feeding.

Table 1 A. Recommended first and second line regime in adults and adolescents

st 1 Line Regimens	nd 2 Line Regimens	Comments
Preferred * ZDV/3TC + NVP or EFV	ABC/ddI + LPV/r or TDF+3TC* or FTC+ LPV/r	-Relatively inexpensive regimen. -ZDV less toxic than d4T. -ZDV causes anemia -If patient is anemic start with TDF
Alternative 1 TDF+3TC or FTC plus NVP or EFV	ZDV+ddI + LPV/r ABC/ddI + LPV/r ZDV+3TC* + LPV/r	-Use of TDF, FTC and EFV has low toxicity, once daily administration, and effective against hepatitis.

		<p>-When affordable, this combination is the preferred first-line.</p> <p>-Patients who have peripheral neuropathy and anemia may be considered for this first line regimen.</p>
<p>Alternative 2 d4T/3TC + NVP or EFV</p>	<p>ABC/ddI + LPV/r or TDF+3TC or FTC + LPV/r</p>	<p>-Generic co-formulated d4T/3TC + NVP is cheap.</p> <p>-d4T, however, is associated with many toxicities</p> <p>-Only d4T 30mg is recommended irrespective of weight.</p>

Adapted and modified from World Health Organization. Antiretroviral Therapy for HIV infection in adults and adolescents: Recommendations for a Public Health Approach (2006 revision)

***3TC can be considered to be maintained in 2nd line regimens to reduce the viral fitness**

Table 2 B. Recommended first and second line antiretroviral regimens for children and infants

st 1 Line Regimens	nd 2 Line Regimens	Comments
<p>Preferred *</p> <p>d4T/3TC + NVP or EFV</p>	<p>ABC/ddI + LPV/r</p> <p>or</p> <p>TDF+3TC or FTC + LPV/r</p>	<p>-Generic co-formulated d4T/3TC + NVP is cheap.</p> <p>-d4T 30mg is safe and preferred in children aged <5 years.</p> <p>-Change d4T to ZDV for children ≥5 years</p>
<p>Alternative</p> <p>ZDV/3TC + NVP or EFV</p>	<p>ABC/ddI + LPV/r</p> <p>or</p> <p>TDF+3TC* or FTC+ LPV/r</p>	<p>-Relatively inexpensive regimen.</p> <p>-ZDV less toxic than d4T.</p> <p>-ZDV causes anemia</p> <p>-If child is anemic start with d4T (≤5 yrs) and switch to ZDV as soon as the anemia recovers or switch to TDF</p>

First Line Regimens	Second Line Regimens for Treatment Failure	Alternative Second Line Regimens for Treatment Failure
d4T/3TC + NVP or EFV ZDV/3TC + NVP or EFV	ABC+ ddI +LPV/r ZDV/ddI + LPV/r ZDV/ABC + LPV/r ABC/ddI + LPV/R	ABC/ddI + ATV/r ZDV/3TC + ATV/r

Table 3 C. Clinical situations and recommendations for the use of antiretrovirals in pregnancy

Clinical Situation	Recommendation
<p>A: HIV-infected women with indications for initiating ARV treatment with potential to become pregnant</p>	<p><u>First-line regimens:</u> ZDV + 3TC + NVP or TDF + 3TC + NVP</p> <p>Efavirenz (EFV) should be avoided unless effective contraception can be assured. Exclude pregnancy before starting treatment with EFV.</p> <p>Counsel on sexual activity, reproductive plans, and use of effective contraception</p>
<p>B: HIV-infected women receiving ART who become pregnant</p>	<p>Women</p> <ul style="list-style-type: none"> • Continue the current ARV regimen unless it contains EFV. If it does, substitution with NVP or a PI or ABC should be considered if in the 1st trimester. • Continue the same ARV regimen during the intrapartum period and after delivery.

	<p>Infants</p> <ul style="list-style-type: none"> • If born to women receiving either 1st or 2nd-line ARV regimens: 1-week ZDV or single-dose NVP or 1-week ZDV + single dose NVP.
<p>C1: HIV-infected pregnant women with indications for ARV treatment</p> <p>CD4<350 cells/mm³</p>	<p>Women</p> <ul style="list-style-type: none"> • Follow the treatment guidelines as for non-pregnant adults except that EFV should not be given in the 1st trimester. • First line regimens: ZDV + 3TC + NVP or TDF + 3TC + NVP • Consider delaying therapy until after the 1st trimester if not severely ill <p>Infants</p> <ul style="list-style-type: none"> • 1-week ZDV or single-dose NVP or 1-week ZDV + single-dose NVP.
<p>C2: HIV-infected pregnant women with indications for ARV treatment BUT</p>	<ul style="list-style-type: none"> • ZDV + 3TC + NVP or TDF + 3TC + NVP and monitor closely for

<p>CD4>250<350 cells/mm³</p>	<p>hepatotoxicity over 12 weeks</p> <ul style="list-style-type: none"> Starting with a triple based NRTI regimen e.g. ZDV + 3TC +ABC or ZDV + 3TC +TDF
<p>D: HIV-infected pregnant women without indications for ARV treatment</p>	<p>Refer for PMTCT program</p> <p>Women</p> <ul style="list-style-type: none"> ZDV starting at 28-32 weeks or as soon as possible thereafter. Continue ZDV at the same dose in labour. In addition, women should receive single-dose NVP at the onset of labour. <p>Infants</p> <ul style="list-style-type: none"> Single-dose NVP and 1-week ZDV
	<p><i>Alternative regimen: ZDV + 3TC</i></p> <p>Women</p> <ul style="list-style-type: none"> ZDV + 3TC starting at 36

	<p>weeks or as soon as possible thereafter.</p> <p>Continue in labour and for 1 week postpartum.</p> <p>Infants</p> <ul style="list-style-type: none"> • 1-week ZDV + 3TC
	<p><i>Alternative regimen: NVP only</i></p> <p>Women</p> <ul style="list-style-type: none"> • Single-dose NVP – for women presenting for the first time in labour <p>Infants</p> <ul style="list-style-type: none"> • Single-dose NVP

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<p>E: HIV-infected pregnant women with indications for starting ARV treatment¹ but treatment is not yet available</p>	<p>Follow the recommendations under D, but preferably use the most efficacious regimen that is available and feasible.</p>
<p>F: HIV-infected pregnant women with active tuberculosis</p>	<p>If ARV treatment is initiated, consider: (ZDV or d4T) + 3TC + TDF or ABC.</p> <p>If treatment is initiated in the 3rd trimester (ZDV or d4T) + 3TC +EFV can be considered.</p> <p>If ARV treatment is not initiated, follow the recommendations under D.</p>
<p>G1: Women of unknown HIV status at the time of labour</p>	<p>If there is time, offer HIV testing and counseling and if positive, initiate intrapartum ARV prophylaxis.</p> <p>Women</p> <ul style="list-style-type: none"> • Single-dose NVP. If in advanced labour do not give the dose but follow the recommendations under H and refer postpartum to ART program

	<p>Infants</p> <ul style="list-style-type: none"> • Single-dose NVP <p>Women in early stage</p> <ul style="list-style-type: none"> • ZDV + 3TC in labour and 1-week ZDV + 3TC postpartum and refer to ART program <p>Infants</p> <ul style="list-style-type: none"> • 1-week ZDV+3TC <p>If there is insufficient time for HIV testing and counseling during labour, then follow recommendations under H and refer mother to ART program.</p>
<p>G2: Women in labour known to be HIV-infected who have not received any ARV drugs</p>	<p>If there is time, initiate intrapartum ARV prophylaxis</p> <p>Women:</p> <ul style="list-style-type: none"> • Single-dose NVP. If in advanced labour do not give the dose but follow the recommendations under H and

	<p>refer postpartum to ART program</p> <p>Infant:</p> <ul style="list-style-type: none"> • Single-dose NVP <p>Women:</p> <ul style="list-style-type: none"> • ZDV + 3TC in labour and 1-week ZDV + 3TC postpartum and refer to ART program <p>Infant:</p> <ul style="list-style-type: none"> • 1-week ZDV+3TC
<p>H: Infants born to HIV-infected women who have not received any ARV drugs</p>	<p>Infants</p> <ul style="list-style-type: none"> • Single-dose NVP as soon as possible after birth and 1-week ZDV <p>If the regimen is started more than 2 days after birth, it is unlikely to be effective.</p>

CHAPTER THREE

3.0 METHODOLOGY

3.1 Research Design

A retrospective cross sectional approach was used in studying a sample of pregnant HIV women attending different health institutions in Bushenyi District.

3.2 Setting of the study

Bushenyi District is located in the western part of Uganda and is 56 kilometers west of Mbarara town. The study was carried out in the following Health Institutions in the District which run HIV clinics.

- Kabwohe Clinical Research Centre.
- Kitagata Hospital.
- Comboni Hospital
- Ishaka Adventist Hospital
- Bushenyi Medical Centre

3.3 Study population.

HIV positive pregnant women attending different health institutions in Bushenyi District from 1st January 2008 to 31st December 2009 were studied.

3.4 Sample size determination

The sample size was one thousand patients calculated using the formula of Fisher *et al.*, 1998.

$$n = \frac{z^2 pq}{e^2}$$

Where n is the sample size

z is the critical value

e is the desired level of precision

p is the estimated proportion of an attribute that is present in the population

q is 1-p

Assuming a prevalence of 10%, 95% CI (z=1.96) and a precision of 5% (e=0.05), sample size of 1000 prescription i.e. approximately 200 prescription per health facility will be analyzed.

3.5 Sampling technique

Data were collected using simple random sampling technique.

3.6 Data Analysis

Data was analyzed manually by tallying the data obtained and charts were used for representation in percentages using Microsoft Excel spreadsheet.

3.7 Inclusion criteria

All inpatient pregnant women with HIV attending the selected health centers in Bushenyi district were included.

3.8 Exclusion criteria

Outpatient pregnant women with HIV attending the selected health centers in Bushenyi district were excluded.

3.9 Outcomes

The principal outcome of this study was prevalence of adherence to guidelines on prescribing of antiretrovirals according to the (UGANDA NATIONAL ART GUIDELINES, 2008)

3.10 Ethical consideration

The Institution Research and Ethic Committee of Kampala International University provided the researcher with permission and an introduction letter to the selected Health Institutions and the researcher also secured a written permission from the District Health office of Bushenyi District.

3.11 Limitations

- Language barrier
- Time constraints
- Limited financial resources
- Load shedding of local power hindering the typing of the research.

CHAPTER FOUR

4.0 RESULTS AND PRESENTATION

Out of 1000 pregnant women, 657(65.7%) were of ages (15-24yrs), 343(34.3%) were between ages of 25-40yrs. 229(22.9%) were married, 31% were Christians, 29% were Catholics and 46.9% were Muslims. 18% of the women had received formal education.

Table 4A. Demographic profile

HEALTH FACILITY	DEMOGRAPHIC PROFILE							
	AGE (years)				MARITAL STATUS			
	(15-24)	%	(25-40)	%	Married	%	Not married	%
KCRC	140	70	60	30	27	13.5	173	86.5
KITAGATA	146	73	54	27	34	17	166	83
KOMBONI	126	63	74	37	63	36.5	137	63.5
ADV	108	54	92	46	48	24	152	76
BMC	137	68.5	63	31.5	57	26.5	143	73.5
TOTAL	657	65.7	343	34.3	229	22.9	771	77.1

$p < 0.000146$

Statistically significant.

HEALTH FACILITY	DEMOGRAPHIC PROFILE						
	LEVEL OF EDUCATION				RELIGION		
	Primary	Secondary	Tertiary	Non	Christians	Catholics	Muslims
KCRC	23	14	5	158	67	32	101
KITAGATA	18	24	6	152	58	43	99
KOMBONI	54	32	2	112	78	65	57
ADV	47	26	9	118	46	24	130
BMC	37	23	13	127	61	57	82
TOTAL	179	119	35	667	310	221	469

$p < 0.00028$

Statistically significant

Representation; Tertiary: university, college or technical school.

Table 5. Percentage of prescriptions containing appropriate determinant of therapeutic effect

ALTH CILIT	DETERMINANT OF THERAPEUTIC EFFECT													
					APPROPRIATE DRUG REGIME									
	Appropriate drug treatment		LAB DIAGNOSIS(CD4 COUNT)		EFV avoided		DOSE SIZE		DOSE FREQUENCY		DURATION		COUNSELING	
	ADH	%	ADH	%	ADH	%	ADH	%	ADH	%	ADH	%	ADH	%
RC	175	87.5	168	84	178	89	196	98	197	98.5	181	90.5	140	70
AGAT	140	70	72	36	152	76	192	96	194	97	179	89.5	98	49
MBON	123	61.5	84	42	134	67	195	97.5	192	96	183	91.5	66	33
IV	157	78.5	150	75	162	81	193	96.5	198	99	185	92.5	82	41
C	168	84	163	81.5	173	86.5	197	98.5	199	99.5	182	91	94	47
TAL	763	76.3	637	63.7	799	79.9	973	97.3	980	98	910	91	480	48

p < 0.019

Statistically significant

Table 5 above shows determinant of therapeutic effect, 763 (76.3%) prescriptions had appropriate drug line treatment and 637(63.7%) had laboratory diagnosis done. 799 (79.9%) prescription had avoided the use of Efavirenz. Appropriate dose size 973 (97.3%), dose frequency 980 (98%), duration 910 (91%) and 480 (48%) counseling.

Table 6. Percentage of prescriptions containing most appropriate route of drug administration

HEALTH FACILITY	MOST APPROPRIATE ROUTE								
	ORAL ROUTE		PARENTERAL ROUTE		RECTAL ROUTE				
	ADH	%	ADH	%	ADH	%	TADH	TNADH	TOTAL
KCRC	200	100	0	0	0	0	200	0	200
KITAGATA	200	100	0	0	0	0	200	0	200
COMBONI	200	100	0	0	0	0	200	0	200
IADV	200	100	0	0	0	0	200	0	200
BMC	200	100	0	0	0	0	200	0	200
TOTAL	1000	100	0	0	0	0	1000	0	1000

p < 1.00

Statistically significant

Percentage of prescription containing most appropriate route of administration, 1000 (100%) prescriptions had oral route administration. However, Parenteral and rectal route of administration were not indicated scoring 0% per each.

Table 7. Percentage of antiretrovirals prescribed by correct name.

HEALTH FACILITY	ANTIRETROVIRALS PRESCRIBED BY CORRECT NAME								
	GENERIC NAME		TRADE NAMES		USE OF ABBREVIATION (NOT OFFICIALLY APPROVED)				
	ADH	%	ADH	%	ADH	%	TADH	TNADH	TOTAL
KCRC	77	38.5	38	19	85	42.5	77	123	200
KITAGATA	98	49	43	21.5	59	29.5	98	102	200
COMBONI	67	33.5	65	32.5	68	34	67	133	200
IADV	54	27	42	21	104	52	54	146	200
BMC	89	44.5	31	15.5	80	40	89	111	200
TOTAL	385	38.5	219	21.9	396	39.6	385	615	1000

p < 0.003

Statistically significant

Table 7 above shows percentages of antiretrovirals prescribed by correct name, 385(38.5%) prescriptions were prescribed by generic name, 219(21.9%) by trade names and 396(39.6%) by abbreviations. These figures were converted into the bar graph shown below.

Table 8. Percentage of antiretrovirals combination with significant advantage

ALTERNATIVITY	DRUG COMBINATION						
	COMBIVIR+NVP		TRUVADA+NVP		ADH	TADH	TOTAL
	ADH	%	ADH	%			
RC	175	87.5	19	9.5	175	25	200
AGATA	140	70	43	21.5	140	60	200
MBONI	123	61.5	54	27	123	77	200
IV	157	78.5	32	16	157	43	200
C	168	84	28	14	168	32	200
TAL	763	76.3	176	17.6	763	237	1000

p < 0.019

Statistically significant

Most drug combination used with significant advantage was combivir with NVP constituting to 76.3% (763) prescriptions, followed by truvada with NVP constituting to 17.6%(176) prescription.

Table 9. Percentage of relevant patient criteria written in each prescription

HEALTH FACILITY	RELEVANT PATIENT CRITERIA								
	AGE		SEX		WEIGHT				
	NO.	%	NO.	%	NO.	%	TADH	TNADH	TOTAL
KCRC	157	78.5	200	100	72	36	157	43	200
KITAGATA	160	80	200	100	68	34	160	40	200
COMBONI	124	62	200	100	94	47	124	76	200
IADV	172	86	200	100	103	51.5	172	28	200
BMC	178	89	200	100	125	62.5	178	22	200
TOTAL	791	79.1	1000	100	372	37.2	791	209	1000

p < 0.025

Statistically significant

Table 9 above shows percentages of relevant patient criteria written on each prescription, Age showing on 791(79.1%) of prescriptions, Sex 1000 (100%) and Weight 372(37.2%) written on each prescription.

Table 10. Percentage of other drugs used concomitantly with antiretrovirals

HEALTH FACILITY	OTHER DRUGS USED CONCOMITANTLY WITH ANTIRETROVIRALS										
	ANTIBACTERIAL		ANALGESIC		ANTIMALARIALS		ANTITB		TADH	TNADH	TOTAL
	NO.	%	NO.	%	NO.	%	NO.	%			
ORC	124	62	98	49	24	12	9	4.5	124	76	200
TAGATA	108	54	116	58	36	18	12	6	108	92	200
OMBONI	119	59.5	108	54	12	6	4	2	119	81	200
DV	128	64	78	39	48	24	6	3	128	72	200
AC	142	71	86	43	28	14	2	1	142	58	200
TOTAL	621	62.1	486	48.6	148	14.8	33	3.3	621	379	1000

$p < 0.00024$

Statistically significant

Other drugs used concomitantly with antiretroviral showed that combination with antibacterials had the highest percentage 62.1%(621)prescription followed by analgesics 48.6%(486), antimalarials14.8%(148) and antiTB 3.3%(33) prescription as shown on table 10 above.

Table 11. Percentage of relevant information in prescription writing

HEALTH FACILITY	RELEVANT INFORMATION IN PRESCRIPTION WRITING												
	LEGIBLE WRITING IN INK		FULL NAME		ADDRESS		SIGN		SPECIAL INSTRUCTIONS				
	ADH	%	ADH	%	ADH	%	ADH	%	ADH	%	TADH	TNADH	TOTAL
KCRC	188	94	172	86	118	59	154	77	102	51	188	12	200
KITAGA KA	178	89	156	78	96	48	142	71	54	27	178	22	200
KOMBO KI	182	91	174	87	124	62	76	38	12	6	182	28	200
ADV	189	94.5	158	79	104	52	112	56	24	12	189	11	200
BMC	192	96	166	83	64	32	178	89	72	36	192	8	200
TOTAL	929	92.9	826	82.6	506	50.6	662	66.2	264	26.4	929	71	1000

p < 0.00431

Statistically significant

Relevant information in prescription writing showed that legible writing in ink on prescription had the highest percentage with 92.9%(929)followed by full name written 82.6%(826),signature 66.2%(662), address 50.6%(506) and special instructions 26.4%(264) respectively as shown on the table 11 above.

Table 12. Overall of determinant of adherence in Bushenyi District

HEALTH FACILITY	DETERMINANT OF THERAPEUTIC EFFECT		APPROPRIATE ROUTE		ANTIRETROVIRALS PRESCRIBED BY GENERIC NAMES	
	TADH	TNADH	TADH	TNADH	TADH	TNADH
KCRC	1235	165	200	400	77	123
KITAGATA	1027	373	200	400	98	102
COMBONI	977	423	200	400	67	133
IADV	1127	273	200	400	54	146
BMC	1176	224	200	400	89	111
TOTAL	5542	1458	1000	2000	385	615

$p < 0.1034$

Statistically significant

HEALTH FACILITY	DRUG COMBINATION		RELEVANT PATIENT CRITERIA		OTHER DRUGS USED WITH ARVs		RELEVANT INFORMATION WRITTEN ON PRESCRIPTION	
	TADH	TNADH	TADH	TNADH	TADH	TNADH	TADH	TNADH
KCRC	175	25	157	43	124	76	188	12
KITAGATA	140	60	160	40	108	92	178	22
COMBONI	123	77	124	76	119	81	182	28
IADV	157	43	172	28	128	72	189	11
BMC	168	32	178	22	142	58	192	8
TOTAL	763	237	791	209	621	379	929	81

$p < 0.0082$

Statistically significant

Table 13. Overall adherence and Non adherence in Health Institutions in Mushi District.

	ADHERENCE	NON ADHERENCE	TOTAL
KCRC	2156	844	3000
KITAGATA	1911	1089	3000
COMBONI	1792	1208	3000
IADV	2027	973	3000
BMC	2145	855	3000
TOTAL	10031	4969	15000

p < 0.024

Statistically significant

CHAPTER FIVE

5.0 DISCUSSION

Prompt and accurate diagnosis of HIV/AIDS is the key to effective disease management and control hence it is important for prescribers to make proper assessment for appropriate management. Correct use of drugs by patients is critical for effectiveness of antiretroviral treatment. The rational use of drugs involves medications available at the lowest possible cost prescribed to meet patients' individual clinical needs given in appropriate doses and for adequate period of time. Many patients in this study were accurately diagnosed 763(76.3%), reflecting the standard way of managing patients. However laboratory diagnosis was low 637(63.7%) this could have been attributed due to heavy patient loads in some health centers, poor knowledge, poor clinical skills or disinterest of the prescriber may be associated with such practices. Lack of close supervision and lack of proper training may also contribute. This could have a negative impact on patients' satisfaction with the care provided in health centers. According to this study appropriate dose was given, with right drug/form represented by 973(97.3%), dose frequency 980(98%), and duration 910(91%) this could be due to the familiarization of these drugs by the prescriber.

The study also revealed a certain percentage (20.1%) of negligence by the prescribers with the use of Efavirenz in pregnant women. Efavirenz is contraindicated in pregnancy due to its potential teratogenicity effect. Counseling as per the study was low with 480(48%) prescriptions, this could have been because most prescribers view counseling as a sole role of Pharmacist. To

avoid confusion and unnecessary costs generic prescribing is always mandatory to prescribers. This study shows that 385(38.5%) of prescription were prescribed in full generic name, use of trade names 219(21.9%) and abbreviations (not officially approved) was 39.6%. This percentages are so alarming and reveals lack knowledge on guidelines which may lead to unnecessary cost to the patients. The data was tested using Chi-square and found to be statistically significant.

A relevant patient criterion is also a crucial factor in prescription writing. This study shows that age was written in 791(79.1%). Weight was not written in most prescriptions with 37.2% of total prescription analyzed simply because most of this hospitals and health centre's did not have functional weighing machines. Age and weight are important factors in determining the dose of ARVs.

Percentage of other drugs used concomitantly with antiretrovirals showed that antibacterials (co-trimoxazole) were widely used with 62.1% as prophylaxis in the prevention of opportunistic infections associated with HIV. Relevant information in prescription writing that is legible writing in ink 92.9%, full names 82.6%, signature of the prescriber 66.2% and address 50.6% shows that the prescribers took adequate time concerning patient information. Special instructions had low percentage of 26.4% ,this could be argued that special instruction are part of patient counseling and is left as the pharmacists' duty.

All the above data was tested using Chi-square and were found to be statistically significant.

P stands for Chi-square

Factors that could have affected the prescribers' attitude towards prescribing include;

- Patient overloading.
- Negative attitude of the prescribers towards HIV/AIDS patients.
- Disinterest of the prescriber towards patient care.
- Lack of proper diagnostic tools in the Health Institutions of practice.

5.1 CONCLUSION

Rational prescribing of ARVs is an important factor in the effective treatment and control strategy of HIV pregnant women. In this study the level of adherence to prescribing of ARVs to HIV pregnant women according to the National guidelines was determined and factors that could affect the prescriber's attitude towards prescribing which include patient overloading, negative attitude of the prescribers towards HIV/AIDS patients and lack of proper diagnostic tools identified.

This revealed that a considerable amount of prescribers actually adhere to the National guidelines.

5.2 RECOMMENDATIONS

GOVERNMENT

- Ensure proper regulation and supervision in Health Institutions to ensure that the laid down policies are followed by the prescribers.
- Supply up to date copies of prescribing guidelines, quality antiretrovirals and appropriate diagnostic equipments to Health Facilities.

PRESCRIBER

- Ensure that the right drug is given to the right patient at the right dosage and at the right time.
- Ensure they follow the appropriate prescribing guidelines when prescribing medication.

PHARMACIST

- Encourage clients to bring ARVs at each visit to the Pharmacy.
- Encourage clients not to take any over-the-counter medications.
- Counsel on how to take ARVs correctly- timing of doses, with or without meals.
- Emphasize the importance of taking ARVs for e.g. suppression of HIV.
- Do pill counts.
- Provide pill boxes (supplied by drug companies).

- Relate possible side effects.
- Liaise with multidisciplinary team members if a problem arises e.g. drowsiness. May warrant change in regimen.
- Encourage support of family member or friend.
- Be a very good listener.

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CHAPTER SIX

APPENDICES

Figure 1. Demographic data in percentages

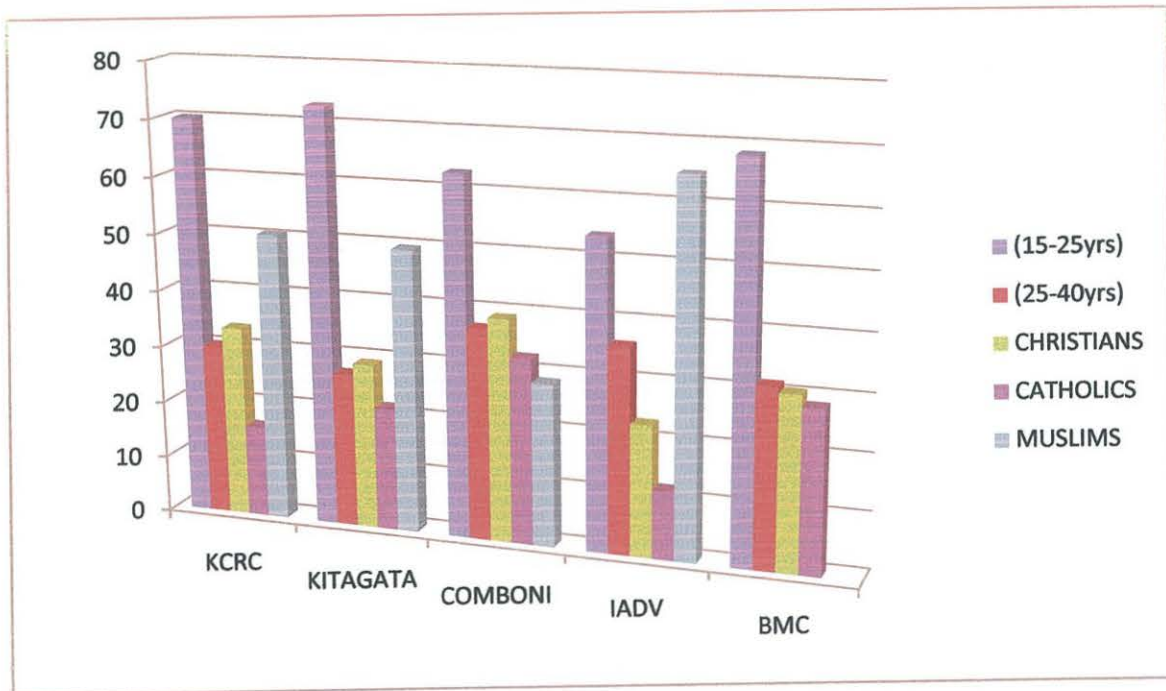
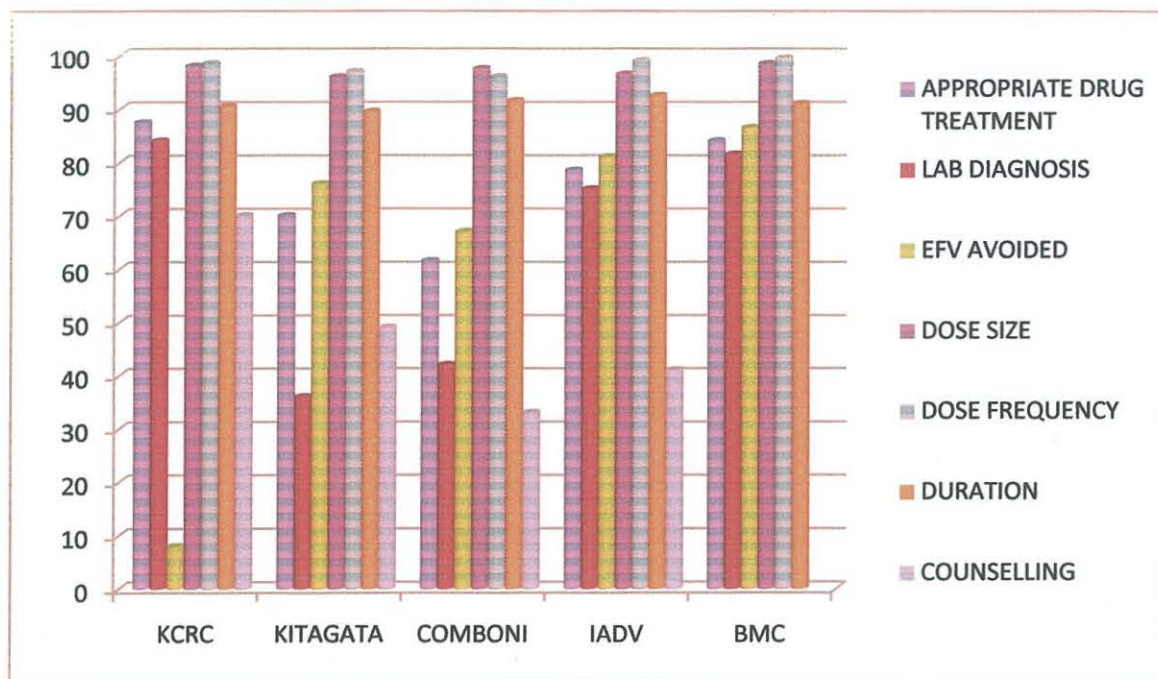


Figure 2. Percentage of prescriptions containing appropriate determinant of therapeutic effect



The figure shows that a high percentage of patients in KCRC were treated appropriately with the lowest percentage in Comboni Hospital.

Figure 3. Percentage of prescriptions containing most appropriate route of drug administration

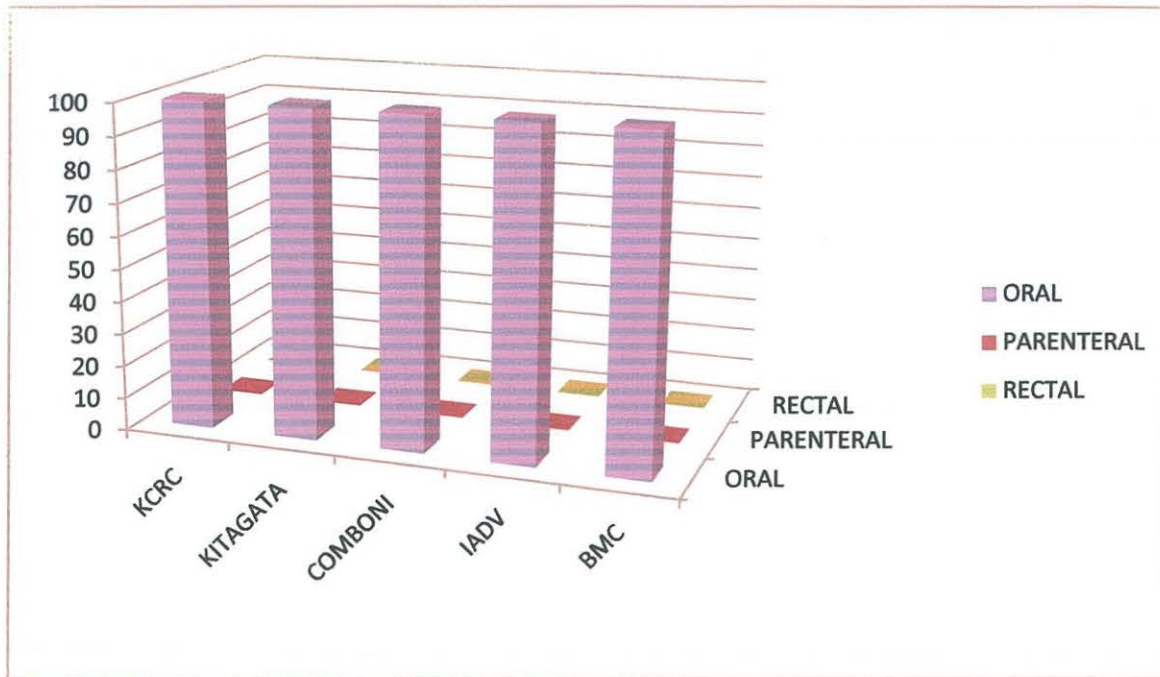


Figure 4. Percentage of prescriptions prescribed by their correct name

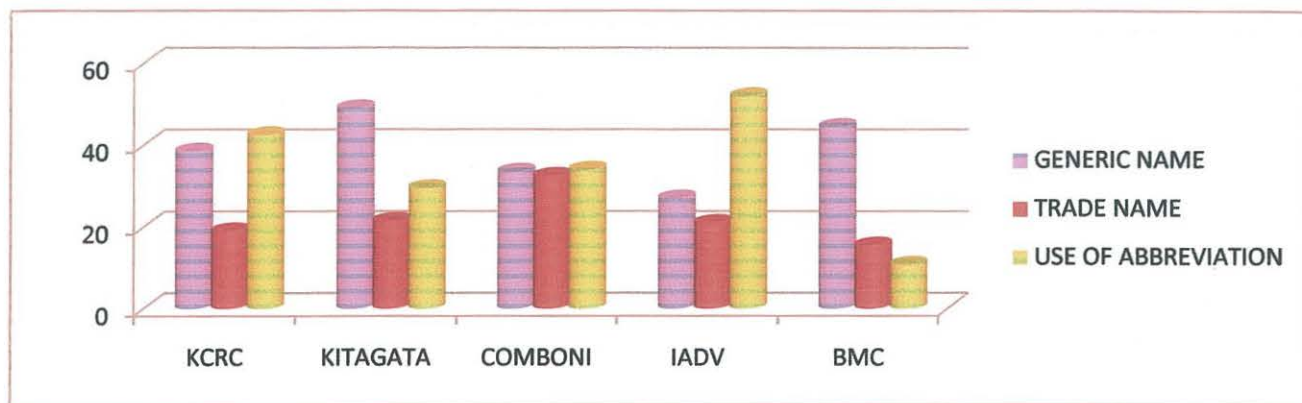


Figure 5. Percentage of antiretroviral combination with significant advantages

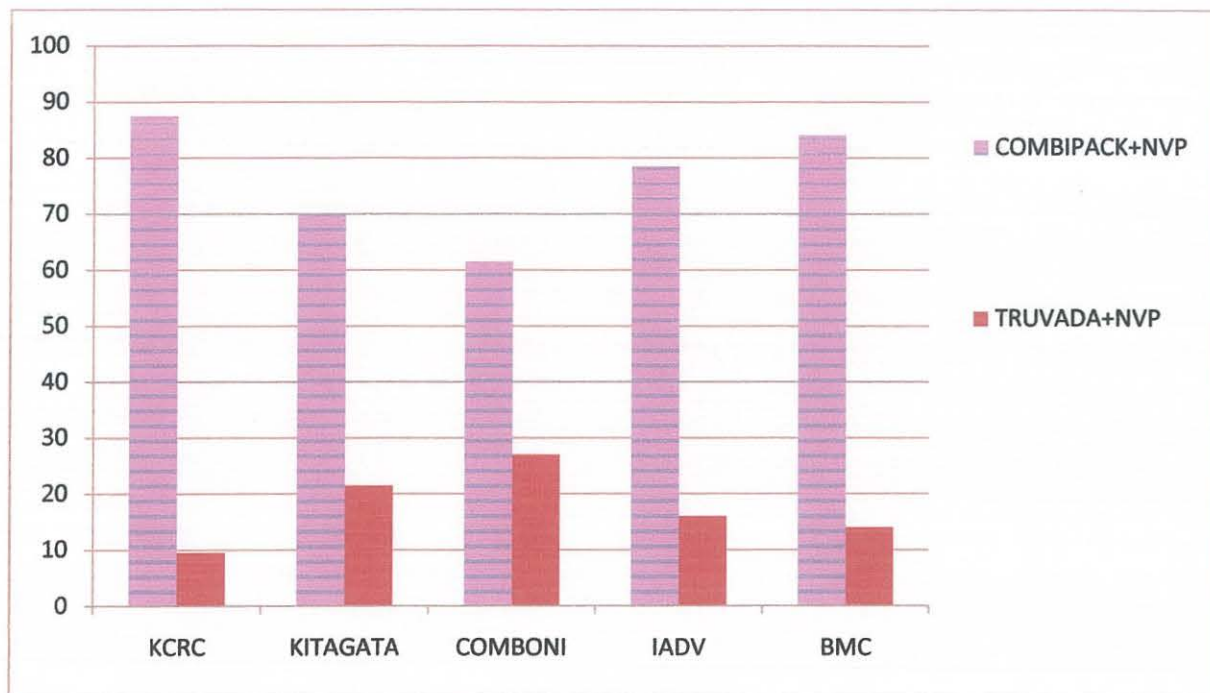


Figure 6. Percentage of relevant patient criteria written in each prescription

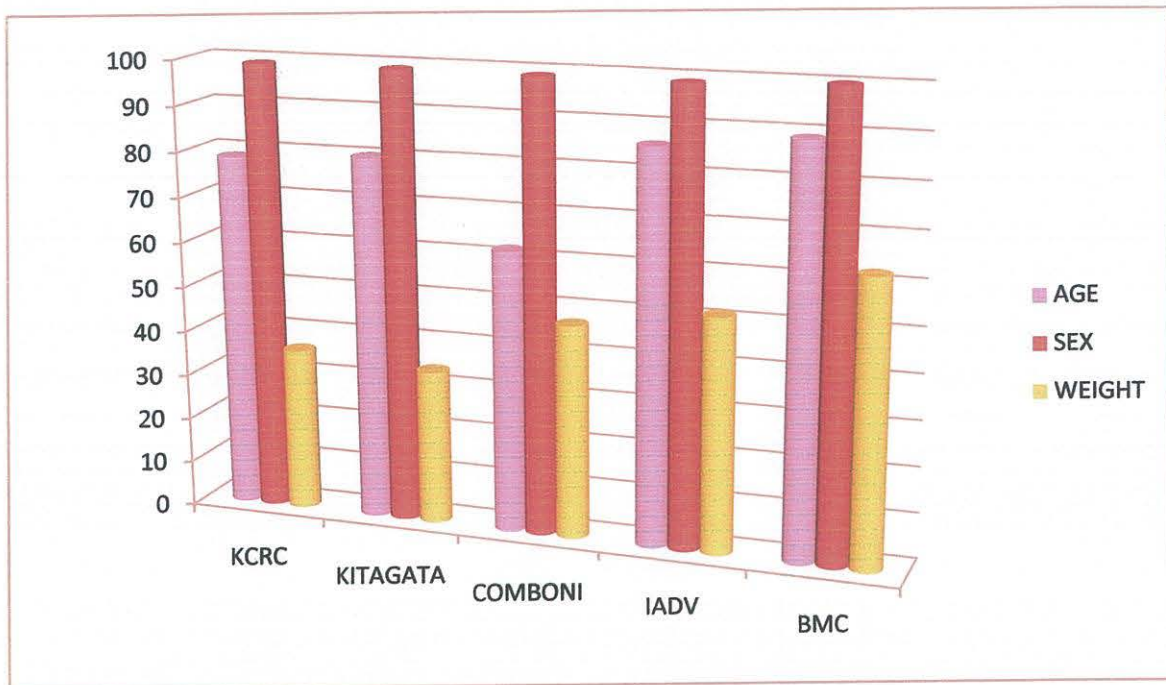


Figure 7. Percentage of other drugs used concomitantly with antiretrovirals.

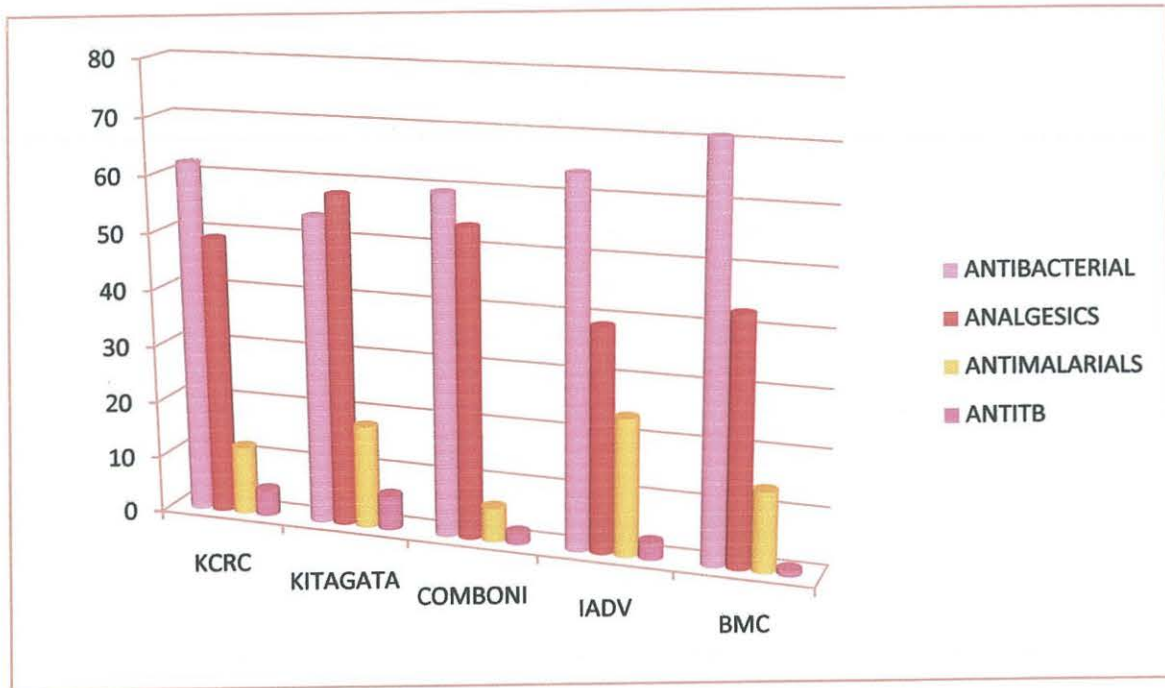


Figure 8. Percentage of relevant information written on prescriptions

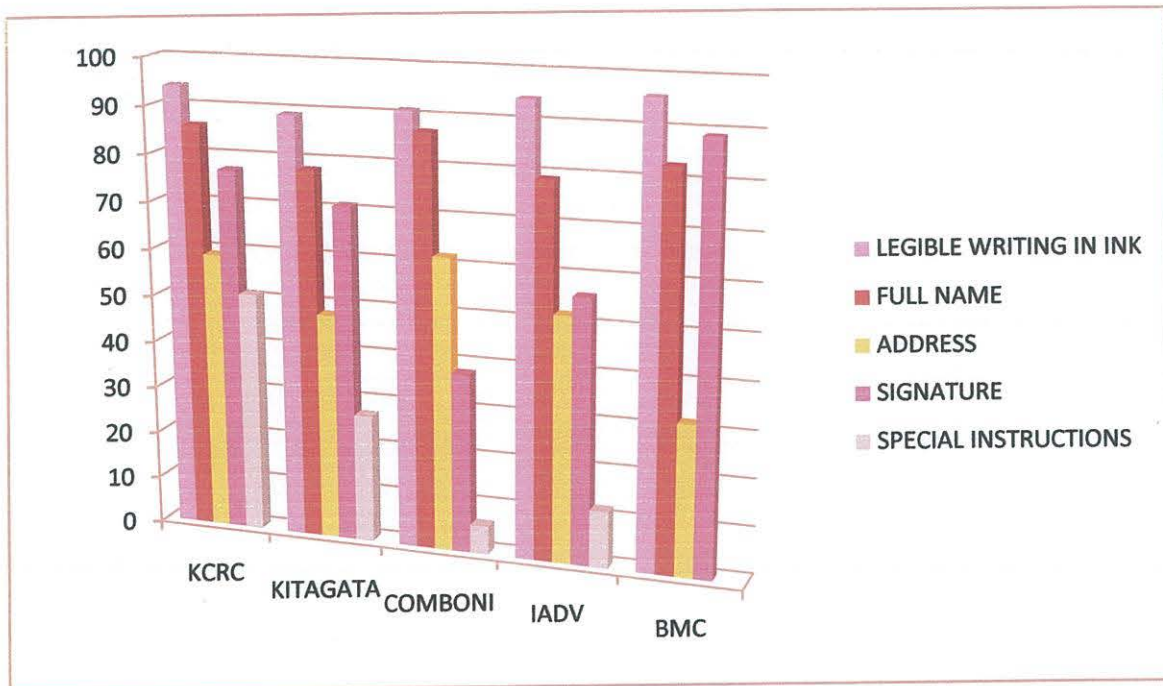


Figure 9. Percentage of determinant of adherence in health institutions of Bushenyi District

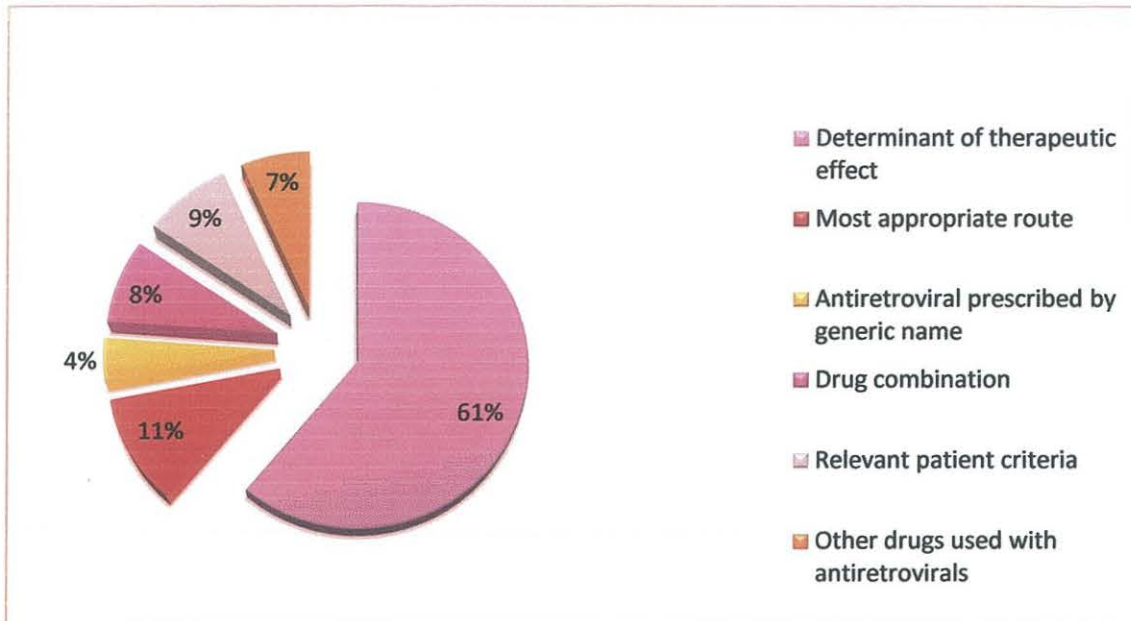
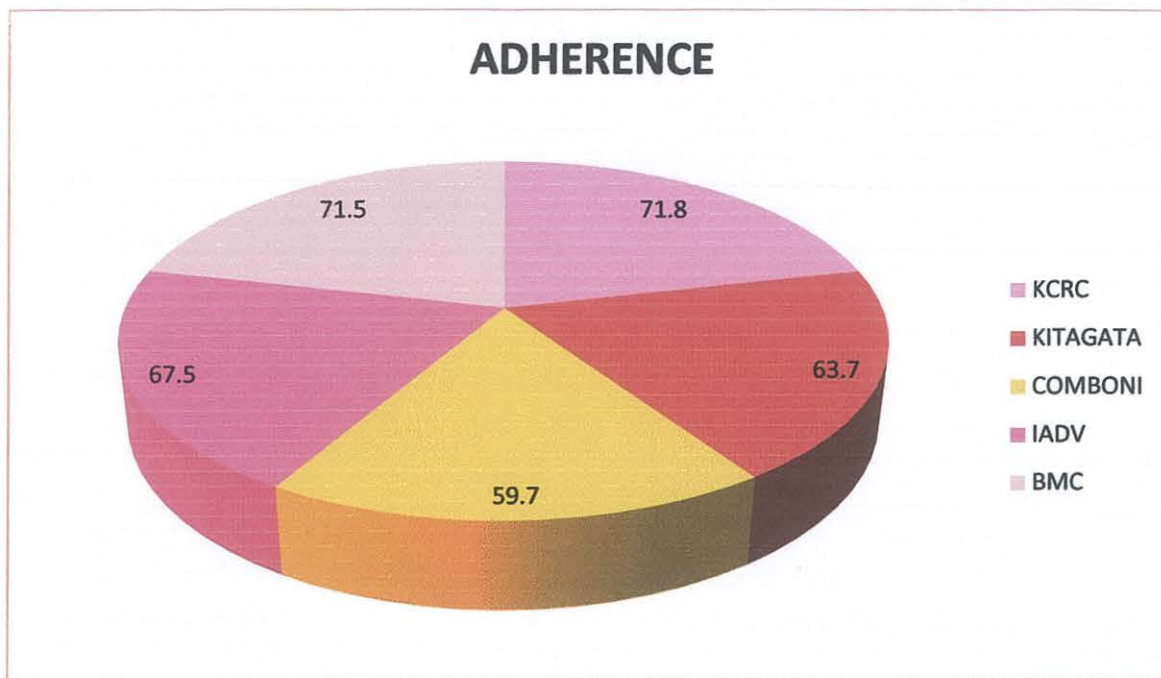
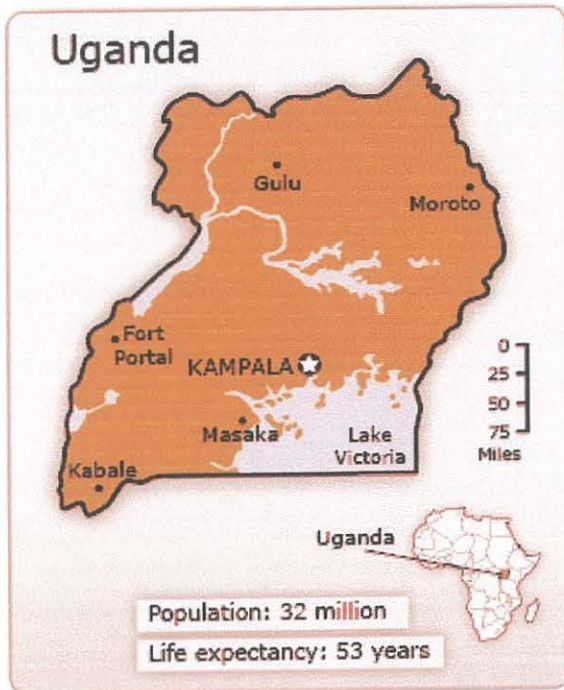


Figure 10. Overall adherence of Health Institutions in Bushenyi District



The leading health centre in accordance to adherence was KCRC(71.8%) followed by BMC with 71.5%, IADV(67.5%), KITAGATA(63.7%) and finally COMBONI with 59.7%.

AIDS in Uganda





**KAMPALA
INTERNATIONAL
UNIVERSITY**
Western Campus

Office of the Associate Dean, School of Pharmacy
Ishaka* P.O. BOX 71 Bushenyi, Uganda:

Tel: +256 (0)782124067, (0)703751534.
E-mail: nduezeh@yahoo.com

Our ref: SPH/KWC/09/0001

Your ref:

23rd November, 2009.

Through DHO Bushenyi District.

KITAGATA HOSP., MUTDOMA, KYABUGUMBI

BUSHENYI HC III, KABWOHE.

COMBONI HOSPITAL, ISHAKA ADVENTIST

BUSHENYI MEDICAL CENTER.

*In-charges
Please assist
the bearer
for DHO*

25/11/09
DISTRICT DEPT. BUSHENYI

Dear Sir/Madam,

LETTER OF INTRODUCTION

This is to introduce Mr Kevin Kariuki, a year V pharmacy student of the above named School who may wish to undertake his research project in your facility. His research topic is: Rational Use of Antiretrovirals Among HIV Patients Attending HIV Clinics In Bushenyi District, Uganda.

Please, assist him kindly.

Thank you for your usual co-operation.

Yours truly,

Ezeonyumelu, Joseph O.C
Associate Dean of School of Pharmacy.