FACTORS AFFECTING ADHERENCE TO PROPHYLAXIS AMONG HIV/AIDS PATIENTS IN RUKUNGIRI DISTRICT, UGANDA

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2009.
DECLARATION

I, Mutauza Simon, hereby declare that the work presented in this dissertation has not been submitted for any other degree in any other University. All work is original unless otherwise acknowledged.

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2. Dr Christine Nalwadda

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DEDICATION

This dissertation is dedicated to my dear parents Kabosi and Were who struggled to lay foundation for my life. I dedicate this work to my children Simon and Anna Maria for the endurances they have gone through during my study period.
I thank the almighty God for enabling me to complete this thesis.
I am very grateful to my supervisors Dr. George William Pariyo and Dr. Christine Nalwadda for their guidance and encouragement that has helped me to this accomplishment.

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## LIST OF ACRONYMS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>AIDS</td>
<td>Acquired Immune Deficiency Syndrome</td>
</tr>
<tr>
<td>ART</td>
<td>Anti-Retroviral Therapy</td>
</tr>
<tr>
<td>ARVs</td>
<td>Anti-Retrovirals</td>
</tr>
<tr>
<td>CDC</td>
<td>Centre(s) for Disease Control</td>
</tr>
<tr>
<td>DHO</td>
<td>District Health Officer</td>
</tr>
<tr>
<td>DHT</td>
<td>District Health Team</td>
</tr>
<tr>
<td>FGD</td>
<td>Focus Group Discussion</td>
</tr>
<tr>
<td>HAART</td>
<td>Highly Active Antiretroviral Therapy</td>
</tr>
<tr>
<td>HIV</td>
<td>Human Immune deficiency Virus</td>
</tr>
<tr>
<td>IEC</td>
<td>Information Education and Communication</td>
</tr>
<tr>
<td>LIP</td>
<td>Lymphocytic Interstitial Pneumonitis</td>
</tr>
<tr>
<td>MOH</td>
<td>Ministry of Health</td>
</tr>
<tr>
<td>MU-JHU</td>
<td>Makerere university-Johns Hopkins University</td>
</tr>
<tr>
<td>SMX</td>
<td>Sulphamethoxazole</td>
</tr>
<tr>
<td>SPSS</td>
<td>Statistical Package for Social Scientists</td>
</tr>
<tr>
<td>TASO</td>
<td>The Aids Support Organization</td>
</tr>
<tr>
<td>TB</td>
<td>Tuberculosis</td>
</tr>
<tr>
<td>TLC</td>
<td>Total Lymphocyte Count</td>
</tr>
<tr>
<td>TMP</td>
<td>Trimethoprim</td>
</tr>
<tr>
<td>PMTCT</td>
<td>Prevention of Maternal To Child HIV Transmission</td>
</tr>
<tr>
<td>PCR</td>
<td>Polymerase Chain Reaction</td>
</tr>
<tr>
<td>PJC</td>
<td>Pneumocystis Jiroveci</td>
</tr>
<tr>
<td>UNAIDS</td>
<td>Joint United Nations Programme on HIV/AIDS</td>
</tr>
<tr>
<td>UPC</td>
<td>Unannounced Pill Count Method</td>
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<tr>
<td>WHO</td>
<td>World Health Organization</td>
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</table>
OPERATIONAL DEFINITIONS

Adherence to medication: Defined as taking at least 95% of the medications (cotrimoxazole) as prescribed by the health care providers in a given period of time.

Cotrimoxazole prophylaxis: Use of cotrimoxazole in the prevention of opportunistic infections among HIV infected individuals.

Non-Adherence to medication: Defined as failure to take/missing to take at least 5% the medications as prescribed in a given period of time.

Opportunistic infection: Infections for which incidence and/or severity is raised in HIV related immune suppression.

Pill count: The number of pills ascertained by counting at a given moment in time.

Primary care giver: Person charged with the primary responsibility of seeing that the patient takes the cotrimoxazole pills.

Primary prophylaxis: Prevention of the first episode of an opportunistic infection.

Secondary prophylaxis: Prevention of the recurrence of an opportunistic infection.

Self-report: Account on the drugs' intake forwarded to the investigator by the patient/care giver.

Side effects: Refer to symptoms thought as having resulted from taking cotrimoxazole during the period of prophylactic treatment.

Unannounced pill counts: Pill counts done at an impromptu home visit.

Pill burden: Number of medication in tablet formulation taken each day.
ABSTRACT

Introduction
Globally 33 million people are estimated to be living with HIV of which 22 million are in Sub Saharan Africa. In Rukungiri district, 20115 people were estimated to be living with HIV/AIDS. With adherence to cotrimoxazole prophylaxis, all these people can benefit from considerable reductions in morbidity and mortality due to opportunistic infections. AIDS account for 17.5% of the discounted life years lost, after malaria in the district. The district notes that treatment of opportunistic infections in HIV/AIDS patients is expensive and this poses a big challenge to the district resources.

Objectives of the Study
This study aimed at establishing factors that influence adherence to cotrimoxazole prophylaxis among HIV positive adult individuals in Rukungiri district in order to generate information that will be utilized by the DHT to enhance cotrimoxazole prophylaxis. This was achieved through identification of patient related factors; drug related factors and health service delivery factors that affect adherence to cotrimoxazole prophylaxis.

Methodology
This was a descriptive cross-sectional study at Kisiizi and Nyakibale Hospitals in Rukungiri district.
Data was collected using both qualitative and quantitative techniques. A total of 283 clients started on cotrimoxazole prophylaxis at least for two months were interviewed using a pre-tested semi structured questionnaire.
Two measures of adherence were used, that is self report and visual analogue scale.
Qualitative data was collected from six Focus Group Discussions using guides.
Quantitative data was entered using EPI INFO 2002 and then exported to SPSS software for analysis. Qualitative data was analyzed manually using master sheet analysis and presented in text form.
Results

From self reports, adherence was 65.7% measured in the previous five days, while on a 30 day visual analogue scale, adherence level was 17.7%.

Independent predictors of adherence were Age (p value of 0.095), Marital status (p value of 0.000), whether any Family member knew about the patient’s HIV status (0.001), Distance from the health facility (p value of 0.042), patients waiting for long hours (p value of 0.028), whether other members in the Family were taking cotrimoxazole prophylaxis (p value of 0.008) and Duration on cotrimoxazole prophylaxis (p value of 0.001).

Conclusion

Levels of adherence by self report were fairly acceptable. However, on a visual analogue scale, levels of adherence were poor. Determinants of adherence in the District include Age, Marital status. Family members knowing about a patient’s HIV status, Distance from health facility, other Family members being on cotrimoxazole prophylaxis and Duration on the prophylactic programme.

Recommendations

Rukungiri District Health Office needs to carry out extensive HIV counseling (and testing) and also increase on the numbers of health workers at the treatment centers.
CHAPTER ONE

INTRODUCTION AND BACKGROUND

1.1 Introduction

Globally 33 million people are estimated to be living with HIV/AIDS of which 22 million are in Sub-Saharan Africa. Many people have died of AIDS in Sub-Saharan Africa despite recent improvements in access to ART (UNAIDS, 2008). An estimated 1 million Ugandans are living with HIV/AIDS while 1 million has so far died of the disease (Uganda HIV/AIDS Sero-behavioral survey, 2004-2005). Rukungiri District with a population size of 324,450 people projected from the 2002 census, 20,115 are estimated to be living with HIV/AIDS (Karyabakabo, 2005).

AIDS is the second cause of death in Rukungiri District accounting for 17.5% of the discounted life years lost after malaria with 29.7% of the discounted life years attributed to it (Rukungiri District annual health work plan, 2004/2005). This high mortality and morbidity is largely due to opportunistic infections like bacterial pneumonias, tuberculosis, toxoplasmosis and other illnesses like malaria and diarrheas which can be prevented (Tindyebewa et al, 2004). Among pneumonias, pneumocystis jiroveci-pjp (formerly called PCP), has been found to be the leading cause of life threatening pneumonias.

The District noted that treatment of opportunistic infections among HIV/AIDS patients is expensive and this poses a big challenge to the District resources (Rukungiri District Local government; three year development plan 2004/5-2006/7). Cotrimoxazole prophylaxis in HIV-infected individuals is the cheapest and most important interventions, next to antiretroviral therapy (ART), to improve survival.

With adherence, cotrimoxazole has been documented to reduce mortality and morbidity in HIV infected individuals due to pneumocystis jiroveci pneumonia (PJP) and other opportunistic infections taken as a daily prophylactic measure. Trials on cotrimoxazole prophylaxis have shown reductions in mortality of between 25% and 46% (MOH, April 2005). Cotrimoxazole prophylaxis for HIV-infected persons in Uganda has also been found to reduce morbidity and
mortality among HIV-uninfected family members (Grimwade et al., 2005). There is, however, limited knowledge on factors that affect adherence to Cotrimoxazole prophylaxis in Rukungiri District.

**Cotrimoxazole prophylaxis**

Drug pharmacokinetics plays a key part in determining adherence to a particular medicine. On the other hand, adherence becomes a serious issue in both determining the response to medication and emergency of drug resistance. As well as keeping tablet volumes low, choosing drugs for which pharmacokinetic data indicate ‘forgiveness’ if dosing is delayed is critical. A lower pill burden is likely to not only improve adherence, but also fit better into patient’s lifestyles. With the WHO two daily recommended tables (WHO/UNAIDS, 2004), cotrimoxazole prophylaxis pill load is enhanced.

Cotrimoxazole is a combination of Trimethoprim (TMP) and Sulphamethoxazole (SMX) in the proportions of 1:5 respectively. The combination offers synergistic effect with a wide spectrum of antibacterial action (BNF, 2004). Use of cotrimoxazole in prophylaxis followed a landmark study in Cote d’Ivoire which demonstrated that cotrimoxazole prophylaxis in people with HIV reduced mortality and morbidity. UNAIDS has since recommended a policy of cotrimoxazole prophylaxis for all HIV-positive people with a CD4 cell count below 500 cells/mm³. This has been adopted in many African countries (Watera et al., 2006). Cotrimoxazole has been documented to reduce mortality and morbidity in HIV infected individuals due to PJP and other opportunistic infections taken as a prophylactic measure. Trials on Cotrimoxazole prophylaxis have shown reductions in mortality of between 25% and 46% (MOH, April 2005). Cotrimoxazole prophylaxis by HIV-infected persons in Uganda has also been found to reduce morbidity and mortality among HIV uninfected family members (Grimwade et al., 2005).

The use of ART with HAART for the treatment of HIV infected individuals has been noted to be essential for enhancing the survival of HIV/AIDS patients. However, with only 64,024 HIV/AIDS patients on ART therapy out of the estimated 110,000 people in dire need of ART therapy in Uganda (UNAIDS, 2004), cotrimoxazole prophylaxis remains critical for their survival. The prevention of opportunistic infections among HIV/AIDS patients using
cotrimoxazole daily is, therefore, important (UNAIDS, 2003). However, access to medications and other health services required for management of HIV-related opportunistic conditions is often limited in many resource-limited settings. Up to 70% of countries surveyed by WHO cited erratic supplies and stockouts as barriers to national scaling up of cotrimoxazole prophylaxis (UNAIDS, 2008).

**Discontinuation of cotrimoxazole prophylaxis**

Cotrimoxazole prophylaxis should be taken indefinitely. WHO recommends a daily adult dose of 960mg (WHO/UNAIDS, 2004). However, in the event of severe side effects such as severe cutaeneous reactions like Stevens Johnson Syndrome, renal and/or hepatic insufficiency or severe hematological toxicity, cotrimoxazole can be stopped and replaced with Dapsone.
1.2 Background
Rukungiri District is located in southwestern Uganda. It is composed of 2 counties, one town council, 11 sub-counties, 77 parishes and 817 villages. Rukungiri town council, the administrative center, is located in Rujumbura county about 400 kms from Kampala; the capital of Uganda. Majority of the district population are rural (94.5%) with only 5.5% urban. Most of the people are subsistence farmers with only very few commercial farmers. Only 49.3% of the parishes have health facilities located therein.

Public health work for both rural and urban is provided by two private NGO hospitals, namely Nyakibale and Kisiizi, 38 health centers, 17 private clinics and 34 drug shops. The two hospitals run ART clinics that offer cotrimoxazole prophylaxis. Rukirigiri District is also blessed with some partners in health and these include AIM programme (this funds HIV/AIDS activities), UPHOLD programme (funds child health, malaria and quality assurance) and UGFATM (funds HIV/AIDS activities). These have partially had a hand in variously enhancing cotrimoxazole prophylaxis in the district.

Implementation of cotrimoxazole prophylaxis, as per the national policy, is supposed to be carried out in all the government health units. Adherence to cotrimoxazole prophylaxis programme is, however, a big challenge in the district. At the two ART centers, namely Nyakibale and Kisiizi Hospitals, where cotrimoxazole prophylaxis is offered as part of the comprehensive ART programme, on going HIV counseling and heath education, attendance for cotrimoxazole refills is too irregular. For instance, out of 435 HIV/AIDS patients on regular ART programme at Nyakibale hospital, none of them consistently refilled his/her cotrimoxazole.
CHAPTER TWO

LITERATURE REVIEW

2.1 HIV/AIDS Burden
The burden of HIV/AIDS disease is high with considerable morbidity and mortality. AIDS related opportunistic infections are currently the leading cause of death among the people aged 15-49 years (MOH, 2002). Approximately 50% of hospitalized patients and 60% of patients with tuberculosis are infected with HIV (MOH, April 2005). The prevalence of HIV/AIDS in Uganda is 6.4 (Uganda Sero-Behavioral survey, 2004).

2.2 Recommendations on the use of Cotrimoxazole Prophylaxis
Cotrimoxazole use for the prevention of opportunistic infections in individuals with HIV/AIDS in Africa was recommended at a conference convened by the Joint United Nations Programme on HIV/AIDS (UNAIDS) and the World Health Organization in April 2000. WHO/UNAIDS recommends its use for prophylaxis as part of the minimum health care package. The recommendation states that cotrimoxazole prophylaxis be provided to adults and children living with HIV/AIDS in Africa with symptomatic HIV disease (Stages 2, 3, or 4 of the provisional WHO classification of HIV), or asymptomatic individuals with a CD4 count < 500 cells/µL or total lymphocyte count equivalent.

A number of studies formed basis for these recommendations. Cotrimoxazole prophylaxis is highly effective in the prevention of pneumocystis jiroveci pneumonia and other opportunistic infections like bacterial infections and toxoplasmosis. Studies conducted in Africa have demonstrated significant reductions in morbidity and mortality due to these opportunistic infections among HIV/AIDS patients. In a case control study conducted in KwaZulu Natal (South Africa) comparing adult HIV patients with tuberculosis on cotrimoxazole prophylaxis with a historical control group not on the prophylaxis programme, 29% reduction in the risk of death was documented in those on daily cotrimoxazole prophylaxis than in the historical controls (p<0.001) (Grimwade et al, 2005).
In a related study, forty three per cent (43%) reduction in hospital admissions, reduced episodes of septicemia, enteric infections and fewer deaths were demonstrated in adult patients on cotrimoxazole prophylaxis co-infected with HIV-1 and tuberculosis (Beda et al. 1995). Further evidence arises from three quasi randomized trials assessing daily administered cotrimoxazole prophylaxis for opportunistic infections among HIV/AIDS patients where significant beneficial effect of cotrimoxazole prophylaxis was registered; for death, relative risk (RR) was 0.69 (95% CI 0.55-0.87), for morbid events RR was 0.76 (0.64-0.9) and (p<0.001) and for hospitalization RR was 0.66 (0.48-0.92) (Grimwade, Swingler, 2003).

In a study by Mermin et al. 2004 among TASO clients between 2001 and 2003, effectiveness of cotrimoxazole prophylaxis was highlighted. Mortality among HIV-1 infected clients started on cotrimoxazole prophylaxis was reduced by 46% compared to the period preceding the study period, with a hazard ratio 0.54 (0.35-084, p-value 0.006). For every 2.6 people with CD4 cell counts below 200 per micro litre on cotrimoxazole for a year, one life year was saved. There was also a significant reduction (72%) in malaria episodes with reduction in levels of malaria parasitemia from an average of 9% before prophylaxis to 2% prophylaxis (Mermin et al, 2004).

2.3 Adherence
Adherence to medication has been defined and phrased differently by various authors. Overall, however, adherence has been viewed as the proportion of a therapeutic regimen taken as prescribed. This is usually measured on a linear scale from 0 to 100% (Descamps et al, 2000; Tsasis, 2001; Lars, Terrence. 2005). Adherence depicts a client’s behavior in undertaking responsibility towards swallowing his/her drugs. Getting a client’s behavior to submit to clinical instructions, on the other hand, equates to compliance which is often used interchangeably with adherence (Moungutou, 2003).

Adherence to cotrimoxazole prophylaxis has been found to reduce the incidence of opportunistic infections and other AIDS related illnesses. As a result there is improvement in the quality of life and increased life expectancy of people infected with HIV. Adherence therefore influences outcome but achieving and maintaining good adherence is a considerable challenge. Maintenance of good adherence to medication has been shown to be hard in chronic illness and this has been a remarkable challenge in HIV/AIDS patients among whom suboptimal adherence
rates have been highlighted (Gallant et al., 1998). This is reflected in a number of studies where adherence over time has been shown to go down;

In a study conducted among TB patients from a rural area of KwaZulu Natal, South Africa, 1321 adults treated for TB between June 2001 and June 2002 in combination with cotrimoxazole prophylaxis (960 mg once daily for 6 months during TB treatment) were compared to a historical control group of 2004 patients treated for TB between 1998 and 2000. After three months, 58% (743 patients) were adherent to cotrimoxazole while at the end of the six months only 43% (523 patients) were adhering to the cotrimoxazole prophylaxis (Grimwade et al., 2005).

This has also been demonstrated in a study on adherence to cotrimoxazole prophylaxis and ARV therapy in Kampala where adherence level on treatment dropped from 81% at one month to 64% after three months (Bakaki et al., 2004). Though this study was a clinical trial among children and a sample size of only 30, decreasing trends in adherence are still exhibited. In a study assessing adherence levels to cotrimoxazole prophylaxis among children attending Makerere University John Hopkins University collaboration (MUJHU) clinic, adherence levels after a period of 3 days, 7 days, 14 days and 30 days was 89.2%, 84.6%, 78.4%, 78.6% and 77.6%, respectively (Kasirye, 2006). With these general trends in adherence, this study set to investigate the adherence level and focused on the factors influencing it.

2.4 Factors affecting adherence to cotrimoxazole prophylaxis

Although cotrimoxazole therapy has been used for many decades, cotrimoxazole prophylaxis is relatively a new concept. Like any other life time prophylaxis, its effectiveness entirely depends on the level of adherence. Documenting the various factors affecting adherence will enhance programme implementers in formulating strategies to improve adherence. These, however, may vary greatly between countries and settings. Several factors affect adherence or prevent people from utilizing the medication according to prescription.

2.4.1 Individual related factors

In a study to evaluate feasibility and effectiveness of Cotrimoxazole prophylaxis in HIV-1 infected adult Ugandans, 763 HIV- positive adults in a semi-urban area of Entebbe were commenced on cotrimoxazole prophylaxis in August 2000 and followed up until March 2002. Mortality and morbidity rates were compared during the twelve months before and after cotrimoxazole prophylaxis had been administered. Only 20.8% of participants attended
scheduled clinic visits for cotrimoxazole refills. The major reasons for defaulting were lack of means of transport and money for the movements from the study area (Watera et al, 2006). This study was conducted in a setting where majority population is fairly educated and have better earnings compared to their rural counterparts. The current study therefore helped in exploring how profound means of transport and money affect adherence in rural settings.

Self-report in a study on adherence showed forgetting to take medication as the biggest hindrance to adherence; 29.9% of the respondents had forgotten to take their medications. Other hindrances to taking medicines as prescribed included; perceiving medicines as toxic to the body (26.2%) and alcohol or illicit substances (15.9%) (Bakaki et al. 2004). In a comparable study on Adherence by Asiimwe (2006), alcohol consumption and stress was found to affect adherence to the prescribed medications (p=0.031) and (p=0.04) respectively. This study, however, was on adherence to ARVs. ART is a relatively new development and therefore this study would not tell much about individual behaviors that affect adherence to lifetime medications.

2.4.2 Drug related factors
Evidence from studies conducted in Africa indicates that cotrimoxazole prophylaxis has few adverse reactions and high levels of adherence (Zachariah et al, 2002; Mwawungulu et al, 2003; Watera et al, 2004). Studies in Africa document adverse events in less than 5% of persons per year, although the potential for cotrimoxazole to cause severe reactions does exist. Eighty percent (80%) of documented adverse effects seen were skin reactions, and 3% were Steven-Johnson syndrome, bone marrow suppression, anemia, neutropenia and jaundice (Lule et al., 2002)

This is also highlighted in a study among HIV-1 infected adult Ugandans in which 763 HIV-positive adults in a semi-urban area of Entebbe were commenced on cotrimoxazole prophylaxis and followed up monthly from August 2000 to March 2002. A check up for complete blood analysis was carried out 6 monthly. Drug related toxicity was monitored as was cotrimoxazole sensitivity of bacteria isolated from participants. Mortality and morbidity rates were compared during the twelve months before versus twelve months after cotrimoxazole prophylaxis. Mortality was reduced by 24% and there was a significant reduction in the incidence of malaria and boils during the post cotrimoxazole period. However, diarrhea increased two-fold, fever increased slightly and oral thrush increased almost threefold in the post cotrimoxazole period.
Adverse events were reported in only 3.8% and were not life-threatening. However, total white cell, granulocyte and CD4 counts fell significantly during cotrimoxazole prophylaxis. Whilst some of this decline was attributable to HIV disease progression, the long-term side effects of cotrimoxazole in large populations remain unclear, and prophylaxis may be indefinite for people with HIV in low-income settings (Wartera et al. 2006).

Studies have shown that long term cotrimoxazole prophylaxis by persons with HIV was not associated with increased antimicrobial resistance among diarrhea pathogens infecting HIV-negative family members. In Uganda, it is estimated that 5% of the adult population <50 years old, and many fewer children, have HIV infection. Thus, even if every person with HIV begins cotrimoxazole prophylaxis, less than 2% of the population would be taking prophylaxis on a daily basis. It is unlikely this would create resistance (MOH, April 2005).

The ability to take and continue to take medicines for many months or years in chronic illnesses is enhanced by a simple regimen. For instance, in ART, patients on one ARV were five times more likely to adhere (OR = 4.725, CI = 1.346-16.582) than those on two types of ARVs (Asiimwe, 2006). Fortunately, WHO recommends a simple regimen of only two tablets single dose in cotrimoxazole prophylaxis.

2.4.3 Health service related factors
How comprehensive a health service programme is, determines the levels of adherence to the therapy. In a randomized trial of an adherence programme for clients with HIV in Melbourne, a comprehensive adherence package improved self reported adherence to ART. The adherence package included an education programme, individualized planning of regimens and the opportunity for a patient to choose from a number of adherence aids and reminder devices. Forty- three individuals were randomized to begin the intervention over a 5-month period. There was a substantial fall in the number of missed doses reported for the last four days (0.76 to 0.38, p=0.03) and last seven days (1.5 to 0.74, p = 0.005). This adherence package improved self reported adherence during the 4 and 7 days (Fairly, 2002). A similar adherence package can be applied to enhance cotrimoxazole prophylaxis. The current study can therefore help elucidate the adherence package in Rukungiri and how the individual components influence adherence. This can then be enhanced and applied to other places.
Stock outs have been shown to be associated with non adherence. In a study in USA, Eldred et al (1998) found out 1.4% of the clients failed to take the medicines because they did not have them by their side, while another 1.4% failed to adhere because of a high pill burden. In Uganda, fortunately, cotrimoxazole is an inexpensive and readily available antimicrobial agent. Daily prophylaxis costs between 15,000 and 25,000 Ugandan Shillings per year (MOH, April 2005). Therefore, the Ministry of Health ensures cotrimoxazole is procured and supplied to patients at no cost at government health facilities.

In the historical case control study above conducted among TB patients from a rural area of KwaZulu Natal, South Africa, adherence to cotrimoxazole prophylaxis went down from 58 % (743 patients) at three months to only 43 % (523 patients) at six months. The most commonly identified reasons patients did not take their cotrimoxazole were related to problems collecting the medication from the clinic like financial, transport or physical constraints or clinics were too far away to attend monthly to pick up the tablets (Grimwade et al, 2005). Whereas this rural environment might compare with Rukungiri, there were methodological limitations like recall problems. It may not have, therefore, explored well these factors influencing adherence.

Ordinarily, health service delivery has been a remarkable determinant of people’s health seeking behaviors. A number of studies have demonstrated this. Asiimwe (2006), in a study on adherence to ARVs conducted in Rukungiri District, showed that availability of ARVs and paying for them both equally affected adherence (p=0.001). This study shows whether adherence is improved when the medications are free (since cotrimoxazole is being supplied free). Also since ART is still a new concept and in the hands of highly qualified better motivated health workers, this study does not technically show how adherence to cotrimoxazole prophylaxis would be affected by other health services delivery factors.
CHAPTER THREE
PROBLEM STATEMENT, STUDY JUSTIFICATION AND CONCEPTUAL FRAMEWORK

3.1 Problem Statement

Adherence to cotrimoxazole prophylaxis among HIV positive persons in Rukungiri district is not well known. Out of 435 HIV/AIDS patients on regular antiretroviral therapy programme at Nyakibale Hospital, none of them had consistently refilled his/her cotrimoxazole in the previous two months (Nyakibale hospital, 2006).

This does not even compare with 20.8% participants who attended scheduled semi-urban clinic visits in Entebbe for cotrimoxazole refills (Watera, 2003). According to the Ministry of Health, all HIV infected adults and children in Uganda should be on cotrimoxazole prophylaxis, regardless of whether they are on antiretroviral therapy or not (policy statement, MOH, April 2005).

The burden of HIV/AIDS related opportunistic infections is high with considerable morbidity and mortality. AIDS related opportunistic infections ranked second cause of mortality in Rukungiri district with 17.5% of life years lost attributed to them at an average age of 29.5 years (Rukungiri District Annual Health Workplan 2005/06). Most of these deaths are due to opportunistic infections.

The District has embraced MOH HIV policy guideline implementation with help of some development partners in areas including HIV Counseling and Testing, school based AIDS education and sensitizing communities on the benefits of cotrimoxazole prophylaxis. The DHT with the help of UPHOLD has carried out sensitization of all the health workers and selected community leaders on the benefits of cotrimoxazole prophylaxis. The District has also integrated cotrimoxazole procurement for the programme. Despite all these, however, client attendances for cotrimoxazole refills have been noted to be irregular. The prevalence and factors influencing adherence to cotrimoxazole prophylaxis among HIV positive persons in the District are not known.

No study has been carried out to document prevalence and factors affecting adherence to cotrimoxazole prophylaxis among HIV positive patients in Rukungiri District.
3.2 Study Justification

Adherence to cotrimoxazole prophylaxis among HIV/AIDS patients significantly reduces mortality and morbidity due to opportunistic infections. Cotrimoxazole prophylaxis has been recommended for use by WHO, UNAIDS, UNICEF & MOH and has been adopted for use by most countries among HIV infected individuals. Adherence to daily cotrimoxazole has been associated with maximal benefits that include delaying progression of HIV to AIDS and the need for ARVs (WHO/UNAIDS, 2001, UNAIDS, 2003).

No study however, had highlighted factors that affected adherence to cotrimoxazole prophylaxis in Rukungiri district. This study documented adherence levels and identified factors that affected cotrimoxazole prophylaxis in Rukungiri district. This information will be used by the DHT and other programme implementers to enhance adherence to cotrimoxazole prophylaxis among HIV/AIDS patients.
3.3 Conceptual Framework of Factors Affecting Cotrimoxazole Prophylaxis among HIV Positive Patients in Rukungiri District

- Drug related factors
  - Drug side effect
  - Pill burden
  - Duration on treatment

- Patient related factors
  - Knowledge on benefits of cotrimoxazole prophylaxis
  - Attitudes
  - Practices
  - Age, sex, religion, marital status
  - Level of education & occupation

- Healthy service factors
  - Drug availability
  - Waiting time
  - Patient – health worker relationship
  - Proximity to treatment center

Adherence to cotrimoxazole prophylaxis is influenced by several factors, which can be categorized into three broad areas;
(1) *Drug related factors* include the pill burden and the side effects of the medicines. The duration one has been on these drugs also matters. These factors can make the patient default on drugs (abandon or miss some doses of cotrimoxazole medicines). This affects adherence to cotrimoxazole prophylaxis with consequent increased morbidity and mortality among patients.

(2) *Patient related factors* include client’s knowledge on the benefits of cotrimoxazole prophylaxis, their attitudes and practices regarding cotrimoxazole prophylaxis. In the same way, patient’s socio demographic characteristics (age, sex, religion, marital status, level of education & occupation) influences adherence to cotrimoxazole prophylaxis: elderly patients are likely not to be as adherent as young ones.

(3) *Health service factors* include availability of cotrimoxazole, waiting time, cooperation of the health workers and the proximity to the treatment centres.

### 3.4 Research Questions

1. What is the level of adherence to cotrimoxazole prophylaxis among HIV infected adults in Rukungiri District?
2. What drug side effects affect adherence to cotrimoxazole prophylaxis among HIV infected adults in Rukungiri District?
3. What patient factors affect adherence to cotrimoxazole prophylaxis among HIV infected adults in Rukungiri District?
4. What health service factors influence adherence to cotrimoxazole prophylaxis among HIV infected adults in Rukungiri District?
CHAPTER FOUR

OBJECTIVES

4.1 General Objective
To establish the prevalence and factors affecting adherence to cotrimoxazole prophylaxis among HIV positive adult individuals in Rukungiri district in order to generate information that can be used to enhance utilization of the programme in the district and other similar settings.

4.2 Specific Objectives
1. To establish the prevalence of adherence to cotrimoxazole prophylaxis among the HIV positive adults in Rukungiri district.
2. To establish drug side effects that affects the adherence to cotrimoxazole prophylaxis among HIV positive adults in Rukungiri district.
3. To identify patient factors that affect adherence to cotrimoxazole prophylaxis among HIV positive adults in Rukungiri district.
4. To identify health service delivery factors that influence adherence to cotrimoxazole prophylaxis among HIV positive adults in Rukungiri district.
CHAPTER FIVE

METHODOLOGY

5.1 Study Area
This study was conducted at Nyakibale and Kisiizi Hospitals in Rukungiri District. These two hospitals run HIV/AIDS clinics that draw clients from the whole District and beyond. The two clinics serve as ART centers, and offer HIV counseling & testing and treatment services for opportunistic infections including cotrimoxazole prophylaxis.

Rukungiri District is located in Southwestern Uganda about 400kms from Kampala, the capital city of Uganda. It is composed of 2 counties, one town council, 11 sub-counties, 77 parishes and 817 villages. The District has an estimated population of 332,000 people projected from the 2002 population census.

5.2 Study Population
The study population comprised of HIV positive adults (both men and women) attending Nyakibale and Kisiizi Hospital AIDS clinics and on cotrimoxazole prophylaxis.

5.3 Study Design
This was a descriptive cross-sectional study that employed both quantitative and qualitative data collection methods.

Data was collected between April and June 2007. This was done everyday from Monday to Friday.

Assessment for adherence to cotrimoxazole prophylaxis in this study was done using two methods. The two measures for adherence employed were:

1. Five day patients’ self-report;

Record of the pills taken/missed by the patient was done for the previous five consecutive days. This was done by the interviewer. Patient was asked to tell the investigator whether he/she took the medications as per the instructions in the previous five days. The investigator then took record of the number of pills taken or missed. Patients found to have missed more than 5% of the required amount of drugs in the five days were considered non-adherent.
2. A 30 day visual analogue scale;
A linear scale ranging from 0 up to 100 graduated at equal intervals of 10 drawn on a piece of paper was used. Patients were explained how to rate themselves and individually requested to score themselves on how the drug was taken in the previous 30 days.

Overall adherence was then computed from the individual adherences of all the respondents got from the five day patient’s self report and the 30 day visual analogue scale. Individual respondent adherences were derived from the attached tools.

Patient, medicine and health service factors affecting adherence to cotrimoxazole prophylaxis were measured using a semi-structured questionnaire and focus group discussions.

5.4 Selection criteria

5.4.1 Inclusion criteria
Respondents were eighteen years and above of age, HIV positive and consented.
Those who had been enrolled onto cotrimoxazole prophylaxis for at least two months prior to the beginning of this study.
Those who attended the two ART centers (Nyakibale & Kisiizi Hospitals) during the study period.

5.4.2 Exclusion criteria
Those who were found too ill to communicate as they were unable to consent.

5.5 Sample size determination
Keish Leslie (1965) formula for determining sample size for a homogenous population was used.

\[ n = \frac{z^2pq}{d^2} \]

Where \( n \) = sample size
\( z = 1.96 \) (z score corresponding to 95% confidence interval)
\( p = \) estimated prevalence of adherence under study of 20.8% (Wateria, 2003).
\( q = 100-p \)
\( d = \) maximum error allowed (5%).
\[ n = (1.96)^2 \times 0.792 \times 0.208 / 0.05 \times 0.05 = 253.1399 \]

Total number of respondents was supposed to be 254. To cater for non response and increase the power of the study, the number of respondents was adjusted at 10%. Therefore number of respondents were 254/0.9, so 283 respondents were interviewed.

### 5.6 Sampling procedure

Respondents for quantitative data were identified from Nyakibale and Kisiizi Hospitals’ ART clinics. Cotrimoxazole tablets for prophylaxis are dispensed to patients in the ART clinics. These two hospitals HIV/AIDS clinics draw patients from the whole District and beyond with an average attendance of twenty patients per day at each clinic. Eligible patients were identified as they come in for treatment, selected, consent sought and enrolled into the study. This was done consecutively. A semi structured questionnaire was administered.

Participants for qualitative data were selected purposively. Four FGDs were held. These FGDs comprised of 6–8 participants with composition based on age and sex;

- One FGD of young male patients (18-30 years of age).
- One FGD of older male patients above 30 years of age.
- One FGD of young female patients (18-30 years of age).
- One FGD of older female patients above 30 years of age.

### 5.7 Study variable

The following variables were considered:

#### 5.7.1 Dependant variable

Dependent variable was adherence to cotrimoxazole prophylaxis, a binary outcome of either adherent or non adherent. Taking at least 95% of the cotrimoxazole as per the instructions was assigned adherent while less than 5% non-adherent in this study.

#### 5.7.2 Independent variables

##### 5.7.2.1 Individual client characteristics

Patient’s socio demographics expressed as patient’s age, sex, religion, marital status, level of education, occupation and place of residence.
Patient’s knowledge and attitudes about HIV/AIDS and cotrimoxazole prophylaxis.

Individual habits as measured by alcohol consumption.

5.7.2.2 Drug related factors

Side effects of cotrimoxazole reported by the respondents like nausea, vomiting diarrhea, fever, lack of appetite and muscle pain.

Pill burden of cotrimoxazole prophylaxis.

Duration on treatment measured by the time the respondent has been on prophylactic programme.

5.7.2.3 Health service factors

Accessibility of the treatment centers measured by distance from respondent’s home.

Time spent by patient before being attended to by health worker measured as waiting time.

Attitude of health workers towards the patients.

Interaction of health care provider with patients (time spent with health provider and explanations given to patients about HIV/AIDS & cotrimoxazole).

Availability of cotrimoxazole at the treatment centers.

counseling services,

Affordability of cotrimoxazole by the

5.8 Data Collection

5.8.1 Quantitative data

Data was collected using semi-structured questionnaires. A team comprising of four research assistants together with the principal investigator administered the questionnaires. The four research assistants were trained before helping in data collection. Eligible patients were identified as they come in for treatment, consent sought, selected and enrolled consecutively into the study. Evaluation for adherence to cotrimoxazole prophylaxis by self report and on a 30 day visual analogue scale was done at this stage. Interviews were conducted from the out patient departments. This was done everyday from Monday to Friday.

5.8.2 Qualitative data
Qualitative data was collected using four Focus Group Discussion (FGD) sessions using guides. These FGDs comprised of 6–8 participants with composition based on age and sex:
- One FGD of young male patients (18-30 years of age).
- One FGD of older male patients above 30 years of age.
- One FGD of young female patients (18-30 years of age).
- One FGD of older female patients above 30 years of age.

Participants were selected purposively. Each FGD discussion was conducted by the investigator who guided the FGDs together with another person taking notes. These FGDs were conducted at appointed dates at venues appropriate to the participants. Soft drinks were served during these sessions. These FGD sessions were tape recorded to ensure none of the verbal deliberations are missed.

5.9 Data quality control
Quality of data was ensured through the following:

5.9.1 Training of research
Four people with medical knowledge and proficient in Runyankole/Rukiga and English were selected and trained as research assistants. The training took place at the hospitals. Training took two days and research assistants were taken through simplified versions of topics relating to this study (HIV/AIDS, cotrimaxazole prophylaxis, questionnaire translations & administration and FGD guidance). This included interviewing skills and correct recording of responses.

5.9.2 Pre-testing
Pre-testing of tools followed the training of research assistants. This was done for purposes of validating the questions and to ensure suitability for interviewing respondents.

It was carried out on 10% of the study sample size. It was done at both Nyakibale and Kisiizi hospitals. This was done on clients attending the two clinics but not residents of Runkungiri district as were already excluded from the study. Adjustments were thereafter made accordingly where necessary. The investigator conducted the exercise.

5.9.3 Supervision
The investigator supervised collection of data. At the end of each working day, a meeting was held between the investigator and research assistants to identify and resolve problems that were encountered during the data collection process. Data collected was reviewed and edited at the
end of each working day by the investigator and his team at the field site. Any mishaps identified were rectified.

5.10 Data management and analysis

5.10.1 Data management
All the variables in quantitative data were coded and edited before data entry. Data was entered using EPI INFO 2002 software package. Double entry was done to ensure correctness of the entered data. The data was then cleaned and stored by the investigator.
Qualitative data was also be cleaned. Recorded data was transcribed from tapes taken during FGDs. The information obtained was coded into themes. The raw data forms were securely kept through out the course of the study.

5.10.2 Data Analysis
Data was exported from EPI INFO 2002 to SPSS for analysis.
Results of Univariate analysis have been presented in frequency tables, pie charts, and graphs.
Bivariate analysis has been used to determine factors that significantly influence adherence to cotrimoxazole prophylaxis. The strength of association was determined using odds ratio.
Multivariate analyses using logistic regression models have been employed to adjust for confounding variables.

Five day self – reported adherence was summarized as a ratio of the doses that were reported to have been taken over the total number of doses that were supposed to have been taken according to the prescription expressed as a percentage. Adherence on the 30 day visual analogue was read off directly from the individual ratings.
Level of adherence was evaluated from the two methods as those respondents who scored at least 95% on both scales.

Qualitative data was grouped under major themes;
1 - Socio demographics and other patient related factors,
2 - Health service factors,
3 - Medicine related factors,
and sub themes were generated.
Qualitative data was then be analyzed using the content thematic approach. Direct quotations from the respondents were recorded for use when presenting study findings.

5.11 Ethical considerations
Ethical approval to conduct the study was sought from Makerere University School of public Health Review Board. Permission was also sought from Rukungiri District authorities through the DHO, administrations of Kisiizi and Nyakibale hospitals.

Informed written consent was sought from the study subjects prior to the interviews. Explanations regarding the study purpose, the nature of interview, benefits, rights of the respondents, and confidentiality of the information were given. Participation in the study was voluntary and only those who gave informed consent were interviewed. Confidentiality was maintained through use of anonymous identifiers. Access to the data was also restricted to the principal investigator.

5.12 Dissemination of findings
Findings of this study was presented to Makerere University School of Public Health.

Copies of this study have been given to the DHT Rukungiri District, Nyakibale and Kisiizi hospital managements, and the community. The study will also be presented at scientific meetings and conferences, and papers published in journals.
CHAPTER SIX

RESULTS

6.1 Study profile.
A total of 283 HIV infected adults who attended HIV/AIDS clinics at Nyakibale and Kisiizi hospitals were enrolled into the study. Participants were enrolled from the two clinics between April 2008 and June 2008. Their levels of adherence to cotrimoxazole prophylaxis and the factors influencing it were assessed. Six focus group discussions were held. Results are presented in text and table formats.

6.2 Demographic characteristics of the study participants.
The median age of the study participants was 34 years with an interquartile range of 27 years to 42 years of age. Mean age was 36.2 years with a standard deviation of 12.6.

Table 1: Socio demographic variables of study participants

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency n = 283 n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex</strong></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>130 (45.9)</td>
</tr>
<tr>
<td>Female</td>
<td>153 (54.1)</td>
</tr>
<tr>
<td><strong>Religion</strong></td>
<td></td>
</tr>
<tr>
<td>Roman catholic</td>
<td>91 (32.2)</td>
</tr>
<tr>
<td>Anglican</td>
<td>85 (30.0)</td>
</tr>
<tr>
<td>Moslem</td>
<td>45 (15.9)</td>
</tr>
<tr>
<td>Pentecostal</td>
<td>55 (19.4)</td>
</tr>
<tr>
<td>Other</td>
<td>7 (2.5)</td>
</tr>
<tr>
<td><strong>Highest level of education attained</strong></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>53 (18.7)</td>
</tr>
<tr>
<td>P1 - P7</td>
<td>115 (40.6)</td>
</tr>
<tr>
<td>S1 - S4</td>
<td>46 (16.3)</td>
</tr>
<tr>
<td>S5 - S6</td>
<td>25 (8.8)</td>
</tr>
<tr>
<td>Tertiary</td>
<td>44 (15.6)</td>
</tr>
<tr>
<td><strong>Occupation</strong></td>
<td></td>
</tr>
<tr>
<td>Peasant farmer</td>
<td>163 (57.6)</td>
</tr>
<tr>
<td>Health worker</td>
<td>10 (3.5)</td>
</tr>
<tr>
<td>Business</td>
<td>40 (14.1)</td>
</tr>
<tr>
<td>Civil servant</td>
<td>44 (15.6)</td>
</tr>
<tr>
<td>Other</td>
<td>26 (9.2)</td>
</tr>
</tbody>
</table>
There were slightly more women (153/283) than men (130/283) on cotrimoxazole prophylaxis who enrolled onto the study. Most of these (238/283) were Christians. The participants were involved in various activities but majority (163/283) were peasants. Majority of the respondents (115/283) were primary leavers. Other occupations included students at various levels. All these are reflected in Table 1.

**Figure 1: Marital status of Participants**

![Graph showing marital status](image)

As seen in Figure 1, 86.6% (245/283) respondents had married at one time, out of whom 56.6% (160/283) were currently married, 15.9% (45/283) widowed while 14.1% (40/283) had separated/divorced with their couples. Only 13.4% (38/283) of the respondents were singles.
Figure 2: Occupation of spouses

![Occupation of Spouses Bar Chart]

Figure 2 shows the different categories of occupations for the respondents' spouses. Majority of the spouses 41.9% (67/160) were peasants tending to their gardens basically for subsistence, with 18.6% (30/160) engaging in various businesses. Eight (5%) of the spouses were health workers, both in government and private service, while 9.4% (15/160) were employed in other areas of civil service.

6.3 ADHERENCE

6.3.1 Levels of Adherence

Levels of adherence were assessed using self reports from participants and visual analogue scale. Results are summarized below:

Self Reports

Average Adherence using self reports was 65.7%.

One hundred eighty six out of two hundred eighty three (186/283) HIV/AIDS infected adults on cotrimoxazole prophylaxis for at least two months had an adherence of 95% and above.

Visual analogue

Average adherence on the visual analogue scale was only 17.7%.
Only fifty out of two hundred and eighty three (50/283) respondents on the programme had met an adherence of at least 95% on a 30 day scale. Most respondents (233) fell short of the 95%.

**Overall Adherence**

Overall adherence by self report and visual analogue scale was only 17.0%. Only forty eight out of two hundred eighty three respondents had adherence levels of at least 95% to the cotrimoxazole prophylactic programme.

**6.3.2 Improving adherence**

It was pointed out in all the six FGDs that it was difficult to take cotrimoxazole pills without missing a single day. The reasons given were multifactorial. Many ways suggested included opening up more clinics in the district and recruiting more health workers, intensifying education talks when they go for drug refills and reviews.

**6.4 Factors influencing Adherence**

**6.4.1 Drug related factors**

**6.4.1.1 Duration on cotrimoxazole prophylaxis**

Figure: 3 Duration on cotrimoxazole prophylaxis by Participants
One hundred and thirty one out of two hundred eighty two respondents (46.5%) had been on cotrimoxazole prophylaxis for more than two years. Mean duration on the program was 17.6 months. Median duration was 12.0 months with an interquartile range of 6 months up to 24 months.

6.4.1.2 Other drugs taken by the participants

One hundred sixty four out of two hundred eighty respondents (58.6%) were concurrently taking other drugs. Out of these one hundred sixty four respondents on other drugs, one hundred fifty nine were taking ARVs while four were on anti TB drugs while one person was swallowing antimalarials at the time of interviews. Mean duration on these drugs was 17.6 months (SD 17.7), median period of 12.0 months with an interquartile range of 6.0 to 42 months.

6.4.1.3 Cotrimoxazole intake by the participants

Majority (186/283) of the people on the program had taken their cotrimoxazole pills in the previous five days. Only (97/283) of the respondents had not taken the pill at least once in a period of five days prior to the interviews as shown in Table 2

<table>
<thead>
<tr>
<th>No. of times missed</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>28</td>
<td>25.5</td>
</tr>
<tr>
<td>2</td>
<td>27</td>
<td>29.8</td>
</tr>
<tr>
<td>3</td>
<td>24</td>
<td>28.7</td>
</tr>
<tr>
<td>4</td>
<td>16</td>
<td>13.8</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>2.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>97</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

A few respondents (2) had not taken any cotrimoxazole in the previous five days.

6.4.1.4 Reasons for missing swallowing cotrimoxazole pills

Of all who missed taking the pills in the previous five days, the majority (39/97) just forgot to take the pills. Other reasons for missing the pills were; lack of transport fare (17/97), perceived or actual lack of effect (15/97), development of side effects (14/97), 10 out of the 97 respondents
missed taking the pills following misinformation from health workers. A small fraction (2.97) stopped taking the pills after they fell very ill with severe vomiting.

Some discussants in focus groups raised vomiting, body weakness, skin rash and headache as side effects felt at one stage or the other during the course of medications. However, these were not viewed as hindrances to adherence.

"Unless one is ill, these side effects are not bad and therefore can't stop one from taking the pill." Said members.

Pill burden featured out as another hindrance to adherence. It was described, high pill burden discouraged people from swallowing all medicines. This was said to be true for people on ARVs as well, but also in instances of short term therapies.

"When one is treating him/herself with anti malarial drugs, one is bound to complete treatment for malaria, and then continue with my cotrimoxazole pills after." Discussants highlighted.

6.4.1.5 Cotrimoxazole prophylaxis perception by participants
Two hundred and fifteen out of two hundred eight three respondents (76%) reported not to be inconvenienced by having to take the daily pill. Only sixty eight out of two hundred eight three (24%) respondents reported being inconvenienced by the daily pill. This was also re echoed during focus group discussions. From all the FGDs on the whole, the prophylactic medication was said to be simple to be complied with.

"Taking one tablet a day is not really hard, biggest problem is forgetting because you are not really sick." Members said.
Drug related factors were analyzed for statistical association with adherence using self report adherence as the dependent variable as shown in Table 3

**Table 3: Drug related factors**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>OR (CI 95%)</th>
<th>X²</th>
<th>df</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration on</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cotrimoxazole</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 6 months</td>
<td>43</td>
<td>37</td>
<td>0.49</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; 6 months</td>
<td>143</td>
<td>60</td>
<td>(0.28 – 0.86)</td>
<td>7.10</td>
<td>1</td>
</tr>
<tr>
<td>On any other drugs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>107</td>
<td>57</td>
<td>0.92</td>
<td></td>
<td>0.12</td>
</tr>
<tr>
<td>No</td>
<td>80</td>
<td>39</td>
<td>(0.54 – 1.55)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inconvenience by</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>daily pill</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>25</td>
<td>43</td>
<td>0.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>160</td>
<td>55</td>
<td>(0.11 – 0.37)</td>
<td>32.36</td>
<td>1</td>
</tr>
</tbody>
</table>

*p* relationship significant at 5% level of significance.

Duration on cotrimoxazole prophylaxis and a feeling of inconvenience by the daily pill intake were found to be significantly associated with adherence with p-values of 0.007 and 0.000 respectively. Respondents who had been on cotrimoxazole prophylaxis for up to six months were 0.5 times less likely to adhere than those who had been on the programme for more than six months. While respondents who did not feel that taking a daily pill was an inconvenience were five times more likely to adhere to their medications than those who felt that the daily pill was an inconvenience.

Using binary logistic regression with self report adherence in the past five days as the dependant variable which was categorized as either adherence of at least 95% or less, duration on cotrimoxazole therapy and perceived/reported side effects to cotrimoxazole were entered into the regression model. With a p-value set at 0.15, duration on therapy was found to be an independent predictor of adherence (p value = 0.001). Respondents who had been on
cotrimoxazole therapy for a period of not more than six months were less likely to adhere (OR 0.342).

This was also reflected in the Focus Group Discussions. Whereas most people appreciated the benefits of cotrimoxazole prophylaxis, it was pointed out that fitting it into one’s lifestyle initially was rather difficult.

"Initial phases are not quite easy to take up, but over time one gets used to the medicine and fits it into his/her lifestyle". They said.

6.4.2 Patient related factors

6.4.2.1 Knowledge of other family members

Out of the 160 married respondents, 141 (88.1%) spouses knew about their partner’s HIV status. 135 (84.4%) spouses knew they were taking cotrimoxazole pills, and 25 (15.6%) did not know that their spouses were taking cotrimoxazole prophylaxis.

Out of the 283 respondents, 181 (64.0%) respondents had other members of their family knowing about their HIV status. On the other hand, 102 out of the 283 (36.0%) respondents had concealed their sero status (HIV Positive) from their family members.

One hundred forty nine respondents had other family members on cotrimoxazole prophylactic programme. Majority of the respondents (77.7%) were getting their pills free without payment, while 22.3% reported some kind of payment at one stage on this prophylactic programme.
6.4.2.2 Alcohol intake by the participants

One hundred forty four respondents on the programme out of the 283 respondents reported taking alcohol. The major reason for drinking alcohol was relieving stressful moments in the evenings.

Frequencies of alcohol ingestion by the participants is shown in Table 4

Table 4: Alcohol Intake by the participants

<table>
<thead>
<tr>
<th>No. of Times</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Every day</td>
<td>74</td>
<td>51.4</td>
</tr>
<tr>
<td>3 or more times a week (Not daily)</td>
<td>30</td>
<td>20.8</td>
</tr>
<tr>
<td>2 times a week</td>
<td>24</td>
<td>16.7</td>
</tr>
<tr>
<td>Once a week</td>
<td>16</td>
<td>11.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>144</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Majority of the respondents 74/144 (51.4%) drunk alcohol daily. Median amount of alcohol taken was 2.0 litres with an interquartile range of one up to two litres maximum amount of alcohol taken was up to six litres.
6.4.2.3 Benefits of cotrimoxazole prophylaxis

Participants' knowledge of the benefits of cotrimoxazole prophylaxis is summarized in Table 5.

Table 5: Participants' knowledge of the benefits of cotrimoxazole prophylaxis

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HIV/AIDS person can benefit from cotrimoxazole prophylaxis</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>227</td>
<td>80.2</td>
</tr>
<tr>
<td>No</td>
<td>25</td>
<td>8.8</td>
</tr>
<tr>
<td>Do not know</td>
<td>24</td>
<td>8.5</td>
</tr>
<tr>
<td>Not sure</td>
<td>7</td>
<td>2.5</td>
</tr>
<tr>
<td><strong>Reasons for taking cotrimoxazole prophylaxis</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- To cure me of HIV/AIDS</td>
<td>188</td>
<td>66.3</td>
</tr>
<tr>
<td>- To alleviate the symptoms and improve</td>
<td>44</td>
<td>15.6</td>
</tr>
<tr>
<td>- Just for consolation</td>
<td>7</td>
<td>2.5</td>
</tr>
<tr>
<td>- Others</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Missing some doses has some effect on health</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>217</td>
<td>76.7</td>
</tr>
<tr>
<td>No</td>
<td>66</td>
<td>23.3</td>
</tr>
</tbody>
</table>

Most respondents 227/283 (80.2%) knew taking cotrimoxazole was beneficial, and actually (66.3%) knew they were taking the medication to alleviate symptoms and improve quality of life. A few 44/283 (15.6%), however, believed this was to cure HIV/AIDS totally, while an equal number thought it was just for consolation. This is reflected in Table 5.
Patient related factors were analyzed for statistical association with adherence using self report adherence as the dependent variable as shown in Tables 6, 7 and 8.

Table 6: Socio demographic characteristics of the participants

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>OR (CI 95%)</th>
<th>X²</th>
<th>df</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>≥ 95%</td>
<td>&lt;95%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>81</td>
<td>49</td>
<td>0.756</td>
<td>1.25</td>
<td>1</td>
</tr>
<tr>
<td>Female</td>
<td>105</td>
<td>48</td>
<td>(0.462-1.236)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 34Years</td>
<td>85</td>
<td>61</td>
<td>0.497</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>&gt; 34Years</td>
<td>101</td>
<td>36</td>
<td>(0.300-0.83)</td>
<td>7.54</td>
<td>1</td>
</tr>
<tr>
<td>Religion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Christian</td>
<td>157</td>
<td>81</td>
<td>1.069</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Moslem</td>
<td>29</td>
<td>16</td>
<td>(0.549-2.083)</td>
<td>0.39</td>
<td>1</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single/Divorce/Widow</td>
<td>93</td>
<td>30</td>
<td>2.290</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Married</td>
<td>92</td>
<td>68</td>
<td>(1.320 -3.980)</td>
<td>10.07</td>
<td>1</td>
</tr>
<tr>
<td>Highest level of education</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None/P1-P7</td>
<td>108</td>
<td>60</td>
<td>0.854</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>S.1-Tertiary</td>
<td>78</td>
<td>37</td>
<td>(0.517 -1.412)</td>
<td>0.38</td>
<td>1</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peasant</td>
<td>107</td>
<td>56</td>
<td>1.15</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Non peasant</td>
<td>75</td>
<td>45</td>
<td>(0.680 -1.930)</td>
<td>0.30</td>
<td>1</td>
</tr>
<tr>
<td>Spouse’s occupation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peasant</td>
<td>49</td>
<td>18</td>
<td>3.607</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Non peasant</td>
<td>40</td>
<td>53</td>
<td>(1.740 -7.540)</td>
<td>14.32</td>
<td>1</td>
</tr>
</tbody>
</table>

*relationship significant at 5 % level of significance.

Participants’ age, sex, religion, marital status, level of education, occupation and spouses’ occupations were analyzed for statistical association with adherence. Respondents’ age, marital
status and occupations of spouses were found to be statistically significant. On the other hand, respondents' sex, religion, level of education and their occupations were not significant.

Age of respondents at a p-value of 0.006 significantly influenced the adherence levels to cotrimoxazole prophylaxis. Respondents over 34 years of age were almost 2 times more likely to adhere to cotrimoxazole prophylaxis than their counterparts below 34 years.

Similar observations emerged from focus group discussions. One's age was hinted on by most discussants in all the FGDs as likely to influence adherence to long term medications in general including cotrimoxazole prophylaxis.

"Young people in most cases take things for granted. They go out without swallowing their pill for whole day. By the time one is back, all he/she remembers is only to eat and sleep" They remarked.

However, older discussants in both the male and female focus groups (above 30 years of age) differed when they brought out forgetting as a potential draw back to adherence.

"One might need reminders to be able to adhere to this life long medication." They said.

"Issues of adherence are hard. Remembering to swallow a tablet everyday is difficult against competing priorities in life." It was argued.

Again marital status at p-value of 0.001 significantly influenced adherence to levels. Participants who were not married (single/divorced/widowed) were almost 2.3 times more adherent to cotrimoxazole prophylaxis than the married respondents. Occupations of the spouses significantly influenced respondents' adherence to cotrimoxazole prophylaxis. The respondents who had peasant spouses were over 3.6 times likely to adhere to medications than respondents whose spouses were not peasants.
On the other hand, respondents' occupations themselves did not exhibit any statistical significance. From FGDs, however, respondents' occupations were noted to be cardinal determinants of adherence to medications. Many discussants pointed out being too occupied as a major set back to adherence. This bracketed those at school and in demanding occupations. Many viewed peasants as likely to have best time on issues of adherence.

"By the time one comes back from school there is a lot on one's mind and ends up forgetting to swallow the daily pill." It was argued.
Patient factors relating to respondents’ information sharing and support within their families were analyzed for statistical association and presented in Table 7.

Table 7: Family information sharing and support

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>OR (CI 95%)</th>
<th>X²</th>
<th>Df</th>
<th>P - value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spouse’s knowledge about client’s HIV status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>27</td>
<td>30</td>
<td>0.259</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>80</td>
<td>23</td>
<td>(0.120 – 0.550)</td>
<td>15.21</td>
<td>1</td>
</tr>
<tr>
<td>Spouse’s knowledge on client’s cotrimoxazole prophylaxis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>63</td>
<td>72</td>
<td>0.688</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>14</td>
<td>11</td>
<td>(0.270 – 1.750)</td>
<td>0.74</td>
<td>1</td>
</tr>
<tr>
<td>Other family members know of your HIV status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>109</td>
<td>72</td>
<td>0.573</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>74</td>
<td>28</td>
<td>(0.330 – 1.000)</td>
<td>4.34</td>
<td>1</td>
</tr>
<tr>
<td>Any other family member taking cotrimoxazole</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>84</td>
<td>65</td>
<td>0.457</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>99</td>
<td>35</td>
<td>(0.270 – 0.780)</td>
<td>9.46</td>
<td>1</td>
</tr>
</tbody>
</table>

* relationship significant at 5% level of significance.

Spouse’s and other family members’ knowledge on respondent’s HIV/AIDS status, and any other family member being on cotrimoxazole prophylaxis were found to be associated with adherence to cotrimoxazole prophylaxis. Spouse’s knowledge on the respondent’s being on cotrimoxazole prophylaxis was not associated with adherence.

Having a spouse aware of the respondent’s HIV status was 0.26 times less likely to enhance adherence. Similarly, having other family members aware of the respondent’s HIV status was
0.573 times less likely to enhance adherence to cotrimoxazole prophylaxis. Having another family member on cotrimoxazole prophylaxis as well was found to be 0.457 times less likely to enhance adherence to cotrimoxazole prophylaxis. Having a spouse aware of the respondent being on cotrimoxazole prophylaxis on the other hand did not show any statistical association. These findings were contrary to observations from focus group discussions. A number of discussants pointed out that confiding in one family member helps enhance adherence to cotrimoxazole prophylaxis.

"A family member will help in such cases as one is too sick to swallow the pills." They agreed.

There were concessional views on the issue of a spouse. Similarly many discussants said having a spouse aware of the medications greatly enhances adherence.

"They will always remind them. This will come like food. The way food is given is the way the pill will come." They asserted.

There was, however, a general observation that this is better with wives as compared to husbands.

"Men usually do not care. They do not take keen interest in their wives health." It was emphasized.
Table 8: Other patient related factors

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>OR</th>
<th>(X^2)</th>
<th>Df</th>
<th>P - value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pay for cotrimoxazole</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pay</td>
<td>32</td>
<td>29</td>
<td>0.508</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Free</td>
<td>152</td>
<td>70</td>
<td>(0.27 - 0.94)</td>
<td>5.39</td>
<td>1</td>
</tr>
<tr>
<td>Alcohol taking</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>84</td>
<td>60</td>
<td>0.508</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>102</td>
<td>37</td>
<td>(0.30 - 0.86)</td>
<td>7.11</td>
<td>1</td>
</tr>
<tr>
<td>Benefits from cotrimoxazole</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>155</td>
<td>72</td>
<td>2.004</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>29</td>
<td>27</td>
<td>(1.06 - 3.79)</td>
<td>5.37</td>
<td>1</td>
</tr>
<tr>
<td>Effect on Health of missing doses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>142</td>
<td>75</td>
<td>0.884</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>45</td>
<td>21</td>
<td>(0.470 - 1.650)</td>
<td>0.17</td>
<td>1</td>
</tr>
</tbody>
</table>

\(p^*\) relationship significant at 5 % level of significance.

Paying for the cotrimoxazole pills, taking alcohol and knowing benefits were associated with adherence to cotrimoxazole prophylaxis. Effect of missing a dose of cotrimoxazole pill on health was found not to be statistically significant.

Those who reported getting drugs free of charge were almost twice likely to adhere to cotrimoxazole prophylaxis than those who reported paying for them. Respondents who perceived cotrimoxazole prophylaxis beneficial were also close to two times more likely to adhere to the medications than those who did not perceive it as beneficial. Respondents who did not take alcohol were over two times more likely to adhere to medications than those who took alcohol. During FGDs alcohol intake was highlighted as a significant factor affecting adherence.

"It is easy to forget taking medicine when you are drunk" they said.
Fear of swallowing cotrimoxazole pill when they have taken some alcohol was highlighted. Using binary logistic regression with dependent variable as self report adherence in the past five days categorized as either adherence of at least 95% or less than 95%, regression was done for independent predictors of adherence to cotrimoxazole prophylaxis. Any independent variable with a p-value of equal to or less than 0.15 was considered for logistic regression.

Variables with a p-value of equal to or less than 0.15 that were not considered to be similar to the dependent variable or related to some other independent variable were included in the model:

**Patient related factors:** Whether any other members of the family knew about the patient’s HIV status, and whether other members in the family were taking cotrimoxazole medication, alcohol use, and perceived benefits.

| Table 9: Patient related independent predictors of adherence to cotrimoxazole prophylaxis by self report |
|-------------------------------------------------|-------------------------------------------------|
| **Variable**                              | **Odds Ratio** | **p value** |
| **Socio demographic factors**               |                 |             |
| Age                                           | 0.611           | 0.095       |
| Marital Status                                | 3.034           | 0.000       |
| **Patient related factors**                  |                 |             |
| Family members knew about the patient’s HIV status | 0.341           | 0.001       |
| Other family members were taking cotrimoxazole medication | 0.443           | 0.008       |

*p* relationship significant at 15 % level of significance.

Age, marital status, whether any other members of the family knew about the patient’s HIV status, and whether other family members were taking cotrimoxazole medications were independent predictors of cotrimoxazole prophylaxis.
6.4.3 Health service related factors

Information on health access, drug availability, attitude of health workers and counseling is summarized and presented in Tables 10 and 11.

Table 10: Access and Drug availability

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance to treatment centre</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;5Kms</td>
<td>137</td>
<td>48.4</td>
</tr>
<tr>
<td>&gt;5Kms</td>
<td>146</td>
<td>51.6</td>
</tr>
<tr>
<td>Drugs availability for refills</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Always</td>
<td>203</td>
<td>71.7</td>
</tr>
<tr>
<td>No</td>
<td>80</td>
<td>28.3</td>
</tr>
<tr>
<td>Alternative sources of cotrimoxazole pills</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>170</td>
<td>60.1</td>
</tr>
<tr>
<td>No</td>
<td>113</td>
<td>39.9</td>
</tr>
</tbody>
</table>

Slightly more respondents 146/283 (51.6%) lived over five kilometers from the treating clinics than 137/283 (48.4%) respondents living within a distance of not more than five kilometers. The majority of the respondents 203/283 (71.7%) said drugs for refills. Also alternative sources of cotrimoxazole pills were available to 170/283 (60.1%) of the respondents.
Table 11: Attitude of health workers and counseling

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time taken to see doctor for treatment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long</td>
<td>113</td>
<td>39.9</td>
</tr>
<tr>
<td>Not long</td>
<td>170</td>
<td>60.1</td>
</tr>
<tr>
<td>Do you perceive the staffs allow you enough time to talk with them?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>205</td>
<td>72.4</td>
</tr>
<tr>
<td>No</td>
<td>78</td>
<td>27.6</td>
</tr>
<tr>
<td>Adequate privacy at the treatment centre</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>167</td>
<td>59.0</td>
</tr>
<tr>
<td>No</td>
<td>116</td>
<td>41.0</td>
</tr>
<tr>
<td>Proper explanations on how to take the drugs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>216</td>
<td>76.3</td>
</tr>
<tr>
<td>No</td>
<td>67</td>
<td>23.7</td>
</tr>
<tr>
<td>Counseling given initially</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>235</td>
<td>83.0</td>
</tr>
<tr>
<td>No</td>
<td>48</td>
<td>17.0</td>
</tr>
<tr>
<td>Counseling done on refills</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>203</td>
<td>71.7</td>
</tr>
<tr>
<td>No</td>
<td>80</td>
<td>28.3</td>
</tr>
</tbody>
</table>

Most respondents, 170/283 (60.1%), considered the time taken to be seen by the doctors as not long. Only 113/283 (39.9%) respondents felt that they waited for long hours before being seen by the doctors. But a bigger fraction, 205/283 (72.4%), of the respondents considered
explanations given by the health workers during clinic visits as adequate, and again a much higher proportion 235/283 (83.0%) of the respondents said they were given initial counseling.

All health service related factors were analyzed for statistical association with adherence to cotrimoxazole prophylaxis. Variables analyzed included; distance from the clinics, waiting hours before treatment, drugs availability for refills, other sources of drugs, whether missing doses was perceived to have any effect on health, adequate privacy, whether staffs allowed enough time to explain about the medication, whether staffs properly explained about medication, received counseling initially, and whether respondents received counseling whenever they came for refills as seen in Tables 12 and 13.

### Table 12: Health access and drug availability for the respondents

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>OR</th>
<th>X²</th>
<th>df</th>
<th>P – value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>≥95% &lt;95%</td>
<td>(CI 95%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distance from the clinics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 5 kms</td>
<td>81</td>
<td>56</td>
<td>0.584</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; 5 kms</td>
<td>104</td>
<td>42</td>
<td>(0.35 – 0.99)</td>
<td>4.58</td>
<td>1</td>
</tr>
<tr>
<td>Wait for long hours before treatment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>62</td>
<td>51</td>
<td>0.451</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>124</td>
<td>46</td>
<td>(0.26 – 0.77)</td>
<td>9.84</td>
<td>1</td>
</tr>
<tr>
<td>Drugs always available for refills</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>139</td>
<td>64</td>
<td>1.525</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>47</td>
<td>33</td>
<td>(0.86 – 2.69)</td>
<td>2.41</td>
<td>1</td>
</tr>
<tr>
<td>Other source of drugs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>105</td>
<td>65</td>
<td>0.638</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>81</td>
<td>32</td>
<td>(0.37 – 1.10)</td>
<td>2.96</td>
<td>1</td>
</tr>
</tbody>
</table>

*p* relationship significant at 5 % level of significance.
Distance from their residences to the clinics and waiting hours at the clinics were found to be statistically significant. Those who lived more than five kilometers away were almost twice likely to adhere to the medications than those respondents who lived not more than five kilometers from these treating clinics.

Respondents who waited for longer hours before treatment were 0.451 times less likely to adhere to medications than those who did not wait for long hours.

Table 13: Health service quality as perceived by respondents

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>OR (CI 95%)</th>
<th>X²</th>
<th>df</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adequate privacy</td>
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<td></td>
<td></td>
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<tr>
<td>Yes</td>
<td>114</td>
<td>53</td>
<td>1.267</td>
<td></td>
<td></td>
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<tr>
<td>No</td>
<td>73</td>
<td>43</td>
<td>(0.75 – 2.15)</td>
<td>0.87</td>
<td>1</td>
</tr>
<tr>
<td>Staffs allow enough time to explain about the medication</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Yes</td>
<td>135</td>
<td>70</td>
<td>1.021</td>
<td></td>
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<tr>
<td>No</td>
<td>51</td>
<td>27</td>
<td>(0.57 – 1.83)</td>
<td>0.01</td>
<td>1</td>
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<tr>
<td>Staffs properly explain about medication</td>
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<td>Yes</td>
<td>141</td>
<td>75</td>
<td>1.049</td>
<td></td>
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<tr>
<td>No</td>
<td>43</td>
<td>24</td>
<td>(0.57 – 1.93)</td>
<td>0.03</td>
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<tr>
<td>Received counseling initially</td>
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<td></td>
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<td>Yes</td>
<td>150</td>
<td>85</td>
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<td>No</td>
<td>32</td>
<td>16</td>
<td>(0.43 – 1.78)</td>
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<td>Receive counseling when you come for refills</td>
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<tr>
<td>Yes</td>
<td>126</td>
<td>77</td>
<td>0.510</td>
<td></td>
<td></td>
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<tr>
<td>No</td>
<td>61</td>
<td>19</td>
<td>(0.27 – 0.95)</td>
<td>5.15</td>
<td>1</td>
</tr>
</tbody>
</table>

*p* relationship significant at 5% level of significance.
Offering counseling whenever clients came for treatment was found to be significantly associated with client’s adherence to cotrimoxazole prophylaxis. Initial counseling done at the time of starting on medication was, however, found not to be significantly associated to adherence.

Using logistic regression, the following variables with a p-value of equal to or less than 0.15 that were not considered to be similar to the dependent variable or related to some other independent variable were included in the model. These were payment for drugs, distance from the health facility, whether a patient had to wait long before drugs were given, and whether the patient had ever missed any medication during a visit. This is highlighted in table 14.

Table 14: Health service related independent predictors of adherence to cotrimoxazole prophylaxis by self report

<table>
<thead>
<tr>
<th>Variable</th>
<th>Odds Ratio</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance from the health facility</td>
<td>0.546</td>
<td>0.042</td>
</tr>
<tr>
<td>Patient had to wait long before drugs were given</td>
<td>0.517</td>
<td>0.028</td>
</tr>
</tbody>
</table>

*p* relationship significant at 15 % level of significance.

Distance from the health facility and whether a patient had to wait long before drugs were given independently influenced adherence to cotrimoxazole prophylaxis.

From qualitative data, money for transport fares was mentioned several times by discussants in all the four FGDs. Money for transport was said to be a big issue affecting adherence especially when distances to the clinic was too long.

"Transport to the clinic is a problem because Boda Boda motorcycles charge highly because of the long distance” they said.

Health staff attitudes were seen as cardinal issues affecting adherence. Issues raised included long waiting times before they are seen, poor attitudes of the health workers and some health workers demanding for some money from them.
"You can get to register in the morning, only to be given drugs in the late afternoon hours" noted the group.

But some discussants attributed this to the fact that they also get some other different drugs from the clinics and therefore this makes them wait for long.

"Many people get ARVs refills on that same day and this makes the health workers busy." Members remarked.
CHAPTER SEVEN

DISCUSSION

7.0 This study investigated HIV/AIDS positive adults in Rukungiri District on cotrimoxazole prophylaxis, pertaining to adherence levels and factors influencing it. A reference level of 95 percent was used to define good adherence. Those respondents who took at least 95% of their doses were regarded adherent to the cotrimoxazole prophylaxis. Five day recall and a 30-day visual analogue scale were used to assess adherence. The two methods were significantly associated to each other.

7.1 Level of adherence to daily cotrimoxazole intake
In this study, adherence level by self report was 65.7%. Using the visual analogue scale, adherence level was much lower at 17.7%. These levels were low in comparison with other studies. In a study assessing adherence levels to cotrimoxazole prophylaxis among children attending MUJHU clinic, adherence level by self report was 77.6% (Kasirye, 2006). This is likely to have arisen from the difference in the study settings; MUJHU clients were in the city and therefore majority of their caretakers were likely to be elite. This was likely to have enhanced adherence among those children. In another adherence study to cotrimoxazole prophylaxis among Ugandan adults attending TASO clinic between 2001 and 2003 by mermin et al and published in the Lancet in 2004, adherence level was 90% by self report. This much higher level of adherence could have been because of the lower reference level of 75% used to define good adherence in that study.

7.2 Factors affecting adherence to cotrimoxazole prophylaxis
Adherence to medications ensures optimal serum levels for good prophylactic purposes. Achieving long term adherence, however, is quite a challenge. Several factors tend to influence this adherence to long term medications. They range from individual related factors including socio demographic characteristics, drug related to health service delivery related factors.

In this study, age of respondents, their marital status, duration on cotrimoxazole prophylaxis, feeling of being inconvenienced by daily pill swallowing, spouse’s knowledge on client’s HIV
status, knowledge of other members on client’s HIV status, other family member(s) being on cotrimoxazole prophylaxis, payment for the cotrimoxazole pills, taking alcohol, knowledge on the benefits of cotrimoxazole prophylaxis on health, distance from treatment centers, waiting for long hours before treatment and receiving ongoing counseling whenever a client went for drug refills were all factors that statistically influenced adherence.

7.2.1 Socio demographies

Many of the respondents on the prophylaxis programe ranged between 30 and 50 years of age. This compares fairly well with the results of the Uganda HIV/AIDS sero-Behavioral survey (2005) that showed the majority of people living with HIV/AIDS to be in that age group. There was a higher fraction of women (54.1%), and this could be because of their better health seeking behavior (MOH, 2004).

Most respondents (80.6%) were Christians, but this could just be because in the general population in Rukungiri District, there are more Christians than Moslems. Several other community studies have made similar observations. In a cross sectional study investigating prevalence levels to anti retroviral therapy among AIDS patients in Rukungiri, 96.2% of the respondents were Christians (Asiimwe B, 2006).

Among the socio demographic characteristics, respondent’s age, their marital status and their spouse’s occupations (for the married respondents) were statistically associated with adherence to cotrimoxazole prophylaxis. Respondents more than 34 years of age were over two times more likely to adhere to cotrimoxazole prophylaxis than those 34 years of age and below. This was likely to be due to the fact that the more mature one was, the more responsive he or she became. Complimenting observations were made by focus group discussants where it was highlighted that young people tend to have a lot on their minds that makes them end up with poor adherence. This was also shown in a study on adherence to cotrimoxazole in Abidjan (Cote d’Ivoire) where adherence among persons aged 35 years and above (59%) was greater than among those below 35 years of age (48%, p = 0.03) (Wiktor et al., 2000).
Whereas one would expect spouse’s support to enhance adherence, single/widowed/divorced clients were almost 2.3 times more likely to adhere to cotrimoxazole medications than their married counter parts. This was likely to be because the widowed acted from their experience of loosing their loved ones and acted in a bid to enhance their survival. Married people quite often got misunderstandings in their homes when they tested HIV positive as to who brought the disease. Those in-house squabbles were likely to affect their adherence levels.

This could arise from and therefore consequently depict low levels of HCT (HIV counseling and testing) and high stigma to HIV/AIDS in the general population. A qualitative research conducted at a comprehensive HIV/AIDS clinic at mildmay (Uganda) highlighted structural factors like stigma as a major barrier to adherence even in the presence of complete disclosure and supportive relationships (Bikaako-Kajura et al., 2006). This was, however, in total contrast to observations made by focus group discussants that having a spouse complimented adherence. In line with observations from focus group discussions, having a peasant spouse was 3.6 times likely to enhance adherence to cotrimoxazole prophylaxis than non peasant spouses. This was likely to be due to time and devotion offered by spouses who were not employed towards family support. Peasants were likely to spend more time at home and therefore more likely to support their partners better than those who are employed. Though no study has demonstrated this before, focus group discussants attributed this to cooperation and more devotion among peasants. None of the other socio demographic characteristics (respondent’s religion, sex, highest level of education and occupation) were statistically associated with adherence. Those findings were similar to those in a study investigating adherence to cotrimoxazole prophylaxis for the prevention of opportunistic infections among HIV-infected tuberculosis patients in Abidjan, Cote d’Ivoire, where no significant difference in adherence was found by sex and education level (all \( p > 0.10 \)). With women emancipation and empowerment, with the growing drive towards girl child education and better health seeking behaviors among women in Uganda, sex, level of education and occupation were therefore likely not to cause any significant difference in adherence.
7.2.2 Drug related factors.

Among drug related factors, development of side effects to the cotrimoxazole pills was noted not to be a hindrance to adherence. From focus group discussions, what appeared side effects were said to be trivial and cotrimoxazole was said to be well tolerated. This was similar to other studies on adherence to cotrimoxazole prophylaxis, even among children. These studies include a study by Grimwade et al., 2005 on adherence to cotrimoxazole prophylaxis among adults, a clinical trial on adherence to cotrimoxazole prophylaxis among adults by Wiktor et al., 2000 and another study on adherence to cotrimoxazole prophylaxis among children by Bakaki PB et al 2002.

Duration on cotrimoxazole prophylaxis and feeling inconvenienced by having to swallow a pill daily were statistically significant. Respondents who had been on cotrimoxazole prophylaxis for more than six months were over two times more likely to adhere to the cotrimoxazole than those who had been on prophylaxis for six months and below. This was likely to be due to the fact that the longer on medications, the better the complacency. Those on cotrimoxazole for longer periods were probably used to the side effects of the drug, benefits from reduced rate of opportunistic infections and also adjusted to the daily pill. In fact respondents who perceived swallowing cotrimoxazole pill daily as not inconveniencing were over five times likely to adhere than those who perceived the daily pill swallowing as an inconvenience.

Concurrent therapies with other medicines were found not to statistically influence adherence significantly. However, focus group discussants remarked simplicity of the prophylactic medication as an aid to adherence. Taking one tablet daily was remarked to be simple enough. The ability to take and continue to take medicines for many months or years in chronic illnesses was aided by a simple regimen. This was also reflected in an adherence study investigating factors affecting adherence to anti retroviral therapy where patients on one ARV were five times more likely to adhere (OR = 4.725, CI = 1.346-16.582) than those on two types of ARVs (Asiimwe B. 2006). This, however, contrasts with findings from a study carried out on MUJHU children in 2006, where being on more than one medication was three times influencing adherence positively. Though this was difficult to explain, it was highly likely that in this
adherence study among MUJHU children, children’s behaviors had been constrained to comply rather than to adhere.

7.2.3 Patient related factors

One of the biggest reported hindrances to adherence in this study was the respondents forgetting to take (swallow) the medicines. This may have arisen out of fatigue associated with long term administration of medications coupled with complacency as their health improve and they fall ill less often. This was also observed from a similar study conducted in the same area exploring adherence to anti retrovirals by Asiimwe (2006) where adherence declined with time.

Lack of transport fare to the clinics to pick the medicines was another issue that effected adherence. This supportive structural factor directly lowered adherence. The finding was similar to the findings from an adherence study conducted among HIV-infected tuberculosis patients in Abidjan, Cote d’Ivoire, where the level of adherence was greater among patients with income above US$80/month (63%) than among those with lower income (49%, p = 0.03) (Wiktor, 2000).

Family members’ support and knowledge of the patient’s disease and treatment were critical to successful adherence: where a patient hides diagnosis of HIV infection from loved ones while taking medication, adherence was compromised. However, in this study, having a spouse without any idea about the HIV status of the respondent was almost four times likely to enhance adherence than when the respondent’s spouse knew about the respondent’s HIV status. A family member(s) having no knowledge of the HIV status of the respondent was almost twice likely to enhance adherence than when they did have any knowledge on the client’s HIV status. This implied HIV status disclosure was still an issue to address. It’s likely that there was high stigma associated with HIV/AIDS in the area, and therefore having other people knowing about one’s sero status results into poor adherence. Even having another family member being on the cotrimoxazole prophylaxis turns out to lower adherence. Having a family member on cotrimoxazole prophylaxis was less likely (0.4 times) to enhance adherence to cotrimoxazole prophylaxis. With high stigma, social support was low. No adherence study done before among adults on cotrimoxazole prophylaxis has documented this. However, in one study on
cotrimoxazole prophylaxis among children in Kampala (Kasirye, 2006), having a child’s caregiver having knowledge on the child’s HIV status or the caregiver being on cotrimoxazole prophylaxis enhanced adherence. This difference could be because of the difference in study settings: majority caretakers were the parents and therefore this alone could have greatly increased the child’s adherence. Again, in Kampala the level of counseling was high compared to the rural communities in Rukungiri.

Payment for the cotrimoxazole pills and drinking alcohol led to poor adherence. Participants who reported some kind of payment were less likely (0.5 times) to adhere to cotrimoxazole prophylaxis than those who entirely got it free throughout. Also in the same way participants who took alcohol were 0.5 times less likely to adhere to cotrimoxazole prophylaxis than those who didn’t take alcohol. Similar observations were made by a number of FGD discussants who reported any kind of payment and alcohol taking as likely to produce poor adherence. Naturally, doing something rewarding encourages that practice. In line with this, those who had knowledge on the benefits of cotrimoxazole prophylaxis were almost twice likely to adhere than those who didn’t.

7.2.4 Health service delivery related factors
Distance to treatment centers, waiting time, privacy, time taken with participants, explanations given by the health workers, availability of drugs, other sources of drugs, initial counseling and counseling done whenever clients went for drug refills were analyzed.

Participants who moved more than five kilometers to treatment centers were almost twice likely to be adherent to medications than those who stayed five kilometers and less to these clinics. This was likely if there was stigma associated with HIV/AIDS because those near the clinics were likely to know and be known by the health workers at the clinics. Those who travelled longer distances were likely to be strangers to the health workers and the people near these clinics and therefore were less likely to have that fear of being discovered that they were on cotrimoxazole prophylaxis because of HIV/AIDS. This was possible where extensive HIV counseling and testing hasn’t been done. So even if in the FGDs, long distances were pointed out as likely to lead to poor adherence, the individual practices showed the reverse.
Long waiting hours before a participant was seen for treatment by the health worker lowered adherence. Those who waited for long hours were 0.5 times less likely to adhere to cotrimoxazole prophylaxis. This was also pointed out during FGDs as a hindrance to adherence. Long waiting hours were said to make participants fatigued and lose hope in the health service system.

Though no specific study on adherence to cotrimoxazole prophylaxis among adults has documented this before, other studies on adherence to other medications have highlighted this (Hecht et al., 1998 & Ostrop et al., 2000).

From FGDs adequate privacy was observed to enhance adherence, though there has been no statistical significance. This was also similar to findings from a study on adherence to ART by Asiimwe, 2006, who also found no statistical significance between adherence and privacy offered at the clinics. This is highly likely attributable to the long duration these participants had been on the program (mean duration on cotrimoxazole prophylaxis program was 17.6 months); amongst themselves they were used to each other and therefore adequate privacy was no longer a critical issue.

Though stock outs didn’t turn out to be statistically significant, 28% of the participants reported occasional stock outs and this featured during FGDs as a cause of poor adherence. A similar observation was made by Bakaki et al. (2004) where stock outs did not significantly influence adherence. This was likely because of the alternative sources of cotrimoxazole like drug shops. Initial counseling done when the participant was being started on cotrimoxazole prophylaxis turned out not to have had any significant relationship with adherence. People tend to forget over time and take issues discussed less serious. This is not different from a study by Kasirye in 2006 among children where less than a half of the children had adherence of at least 95% when their caregivers had received initial counseling.
CHAPTER EIGHT

CONCLUSIONS AND RECOMMENDATIONS

8.1 CONCLUSIONS

1 Level of adherence by self report was fair. But much lower level of adherence was achieved on visual analogue scale.

2 Factors which independently affect adherence to cotrimoxazole prophylaxis were age, marital status, distance from health centre, waiting for long hours before getting treatment, and knowledge of other family members on clients HIV status and other family members taking cotrimoxazole medication.

8.2 RECOMMENDATIONS

1 The district in collaboration with MOH should increase on the number of cotrimoxazole prophylaxis/ART centers in the district so as to reduce on distances to these centers.

2 The district in collaboration with the managements of Nyakibale and Kisiizi hospitals should increase on the number of health workers at these HIV/AIDS clinics so as to reduce on waiting time.

3 Extensive HIV counseling and (testing) needs to be done in Rukungiri district by the DHT so as to reduce stigma attached to the disease even at family level.

8.3 STUDY LIMITATIONS

1 One of the major study limitation was information bias as respondents had to recall some of the events from past memory.

2 There was also selection bias as respondents had to be recruited from only those who attended Nyakibale or Kisiizi hospital. Eligible subjects who did not come to these hospitals did not participate in the study.

3 Resources and Time limited scope of the study. With enough resources, an unannounced home pill count should have been done.
REFERENCE

AIDS epidemic updates December 2005 UNAIDS


Nyakibale Hospital Records, 2006.

Presentation by Dr. Karyabakawo on 28th September 2005.


Rukungiri District local government. three year development plan 2004/5-2006/7.

Stone VE, Adelson-Mitty J, Duefield CA, Steger KA, Stein MD, Mayer KH. Adherence to protease inhibitor (PI) therapy in clinical practice: Usefulness of demographics, attitudes and knowledge as predictors (Abstract 32360) 12th.


## APPENDIX I: BUDGET

<table>
<thead>
<tr>
<th>Activity</th>
<th>Quantity</th>
<th>Unit price (Ug. Sh)</th>
<th>Amount (Ug. Shs)</th>
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<td><strong>A. Proposal and questionnaire development</strong></td>
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<td></td>
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<td>90,000</td>
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<tr>
<td>2. Pens and markers</td>
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</tr>
<tr>
<td>3. Literature search</td>
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<td>4. Printing services</td>
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<tr>
<td><strong>B. Data Collection</strong></td>
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<td>1. Meals</td>
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<td>2. Transport</td>
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<td>3. Research Assistant allowances</td>
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<td><strong>E. Miscellaneous</strong></td>
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<td></td>
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APPENDIX II: PATIENT CONSENT FORMS

CONSENT FORM TO PARTICIPATE IN THE RESEARCH STUDY

Title: Factors influencing adherence to cotrimoxazole prophylaxis in Rukungiri District, Uganda.
Investigator: Mutuaza S.

A. Purpose
To find out factors influencing adherence to cotrimoxazole prophylaxis in Rukungiri District, Uganda.

B. Procedure
If you accept to be involved in this study, you are being requested to participate voluntarily. You will be expected to answer some questions to the best of your knowledge. Please give the truth, there is no wrong or right answer.

C. Benefits
There will be no direct benefit to you as a result of participating in this study, but by doing so, the results will be used to devise ways of improving the quality of care. You can also ask questions for which help may be provided.

D. Risks
There will be no risk whatsoever associated with taking part in the study. What you say even if it is negative it will not be told to any member of staff or be used against you at all.

E. Confidentiality
All the information you give in this study shall be used only for the purpose of this research and will not be divulged for any other use.

F. Right to refuse or withdraw
Your participation is entirely voluntary, and you are free to take part or withdraw at any time.

Consent form
I, ................................................................. hereby consent to participate in the study. I have been informed about the nature of the study and its importance.
Date: ...........................................

APPENDIX III: QUESTIONNAIRE

Section A: Socio-demographic characteristics.

ID No-----------------

1. Sex
   (1) Male
   (2) Female

2. What is your age (Completed years)?---------------------

3. What is your religion?
   (1) Roman Catholic
   (2) Anglican
   (3) Moslem
   (4) Pentecostal
   (5) Other (specify) ------------------

4. What is your marital status?
   (1) Single
   (2) Married
   (3) Divorced/separated
   (4) Widowed
   (5) No answer

5. What is the highest level of education you have attained?
   (1) None
   (2) Lower primary (P1-P7)
   (3) Ordinary level secondary (S1-S4)
   (4) Advanced level secondary (S5-S6)
   (5) Tertiary

6. What is your occupation? ------------------------------

7. What is your spouse's occupation? -------------------(If married).

Section B (drug related factors)

8. For how long have you been taking cotrimoxazole prophylaxis?
   (1) Two months or less
   (2) Between 2 months and 6 months
   (3) Between 6 months and 24 months
   (4) Two years and more
9. Are you on any other drugs currently?
   (1) Yes
   (2) No

10. If yes, what drugs?..............................

11. And for how long?

12. Have you missed taking your cotrimoxazole before in the last five days?
   (1) Yes
   (2) No

13. If yes, how many times on average have you missed taking your cotrimoxazole?

14. Why did you miss taking you pills?
   (1) Forgot to take the pills
   (2) Got side effects (perceived or actual)
       - Skin rash/itching
       - Nausea/vomiting
       - Headache
       - General body weakness
       - Flu – like symptoms
       - Fever
       - Muscle pain
       - Other (specify) ..........................
   (3) Perceived or actual lack of effect
   (4) Lacked transport fare
   (5) Was instructed by health care provider not to take
   (6) Concurrent conditions (e.g. vomiting)
   (7) Didn’t money for the drugs
   (8) Others (specify) ..........................

15. Does this cotrimoxazole prophylaxis medication bother you in any way?
   (1) Yes
   (2) No

If yes how? .................................
Section C (Patient related factors)

16. Does your spouse know about your HIV status?
   (1) Yes
   (2) No

   (ii) If yes, does he/she know that you are taking cotrimoxazole?
       (1) Yes
       (2) No

17. (i) Do other members of your family know about your HIV status?
       (1) Yes
       (2) No

       (ii) Are there other people taking cotrimoxazole in your home?
           (1) Yes
           (2) No

18. Do you pay for cotrimoxazole or do you get it free?
    (1) Pay
    (2) Free

19. (i) Sometimes people find themselves where they need to take alcohol.
       Have you been in such a situation when you needed to take alcohol?
       (1) Yes
       (2) No

       (ii) If yes, how frequently do you drink alcoholic beverages?
           (1) Every day
           (2) Three times a week or more
           (3) One to two times a week
           (4) Less than once a week

       (iii) How much alcohol do you take? ..............................................................

20. Do you think a person who has HIV/AIDS can benefit from this treatment?
    (1) Yes
    (2) No
    (3) Do not know
    (4) No answer
21. Why are you taking these drugs?
   (1) To cure me of HIV/AIDS
   (2) To alleviate the symptoms and improve my health
   (3) Just for consolation that at least I am taking some medication
   (4) Others (specify) .................................................................  

22. (i) Do you think when you miss some doses has any effect on your health?
   (1) Yes
   (2) No
   (ii) If yes, how? .................................................................

Section D (Health service delivery factors)

23. How far is the treatment centre from your home?
   (1) <5kms
   (2) >5kms

24. Do you wait for long hours before seeing the doctor or getting the medicine?
   (1) Yes
   (2) No
   If yes, has this ever made you miss drug?
   (1) Yes
   (2) No

25. Do you sometimes miss getting drugs?
   (1) Yes
   (2) No

26. Do you perceive adequate privacy at the treatment centre?
   (1) Yes
   (2) No

27. Do you perceive the staffs allow you enough time to talk to them?
   (1) Yes
   (2) No

28. Does the staff properly explain to you how the drugs are to be taken?
   (1) Yes
   (2) No

29. Are the drugs always available whenever you go for refills?
   (1) Yes
   (2) No
30. Do you have another source of cotrimoxazole?
   (1) Yes
   (2) No

31. If yes, which one?

32. Did you receive counseling initially before you started on cotrimoxazole prophylaxis?
   (1) Yes
   (2) No

33. Do you receive counseling when you come for cotrimoxazole refills
   (1) Yes
   (2) No

Section E. (Adherence)

34. Patient’s self-report on a five-day pill intake:

   Adherence calculation
   
   \[ a = \text{Doses taken in the five days} \]
   
   \[ b = \text{Doses supposed to be taken according to prescription} \]

   Adherence using patient self-report = \( \frac{a}{b} \times 100 \).

35. Visual analogue scale:

   Interviewer demonstrates how one can rate his/her adherence to cotrimoxazole prophylactic doses using 

   30-day visual analogue scale

   ![Visual Analogue Scale](image)

   Client is helped to mark his adherence on this scale in the last month.
APPENDIX IV: FOCUS GROUP DISCUSSION GUIDE

TOPIC: Factors affecting adherence to cotrimoxazole prophylaxis among HIV infected adults in Rukungiri district.
Date and time ........................................................................................................................................
Language used ....................................................................................................................................
Number of participants .......................................................................................................................
Age range of participants ......................................................................................................................
Moderator ............................................................................................................................................... 
Comments .............................................................................................................................................

Introduction
You are welcome to this discussion. We are from Makerere University Institute of Public Health. We are carrying out a study to determine factors affecting adherence to cotrimoxazole prophylaxis among HIV/AIDS patients. The information obtained will provide basis for formulating strategies to promote adherence to cotrimoxazole prophylaxis. Information from our discussion will be handled with utmost confidentiality. Our discussion proceedings will be tape recorded so that our views can be reviewed whenever there is anything deemed missing. Please answer questions and ask questions.

Thank you

1. What problems do HIV/AIDS people encounter?
2. Some patients miss taking their drugs as instructed by their doctors. Why do you think this happens?
3. What do you think are patient related factors that affect adherence to this cotrimoxazole prophylaxis? (Probe)
4. What do you think are medicine related factors that affect adherence to this cotrimoxazole prophylaxis? (probe)
5. How can adherence to cotrimoxazole prophylaxis be improved?

THANK YOU
### APPENDIX V: TIME FRAME

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