

## **A Botswana study**

### ***RESEARCH PROPOSAL. 2<sup>nd</sup> Draft.***

**TOPIC. Factors that influence adherence to antiretroviral therapy - a pre-intervention study.**

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## **1. Introduction.**

We are in the third decade of what has become the most important infectious disease epidemic [pandemic] in the last century. UNAIDS FACT SHEET 2004, estimated that more than 40 million people world wide are currently living with HIV/AIDS, one third of them are young people between the ages of 10 and 24 years old. Sub- Sahara Africa is the most severely affected regions with over 28 million people living with HIV/AIDS as at the end of 2003<sup>1</sup>.

Botswana is one of the countries hardest hit by the worldwide HIV epidemic. In 2004 there were an estimated 260,000 people in Botswana living with HIV in a country with a total population of 1.6 million and a prevalence rate of 38%, one of the highest in the world<sup>2</sup>

In developed countries, the development of and use of antiretroviral medicines has meant an improved quality of life for people living with HIV/AIDS. This has also brought about a dramatic decline in mortality as a result of AIDS. The introduction of highly active antiretroviral therapy (HAART) that is combination of at least three different antiretroviral drugs has made HIV/AIDS a treatable infectious disease.<sup>3</sup>

While HAART has made HIV a treatable infectious disease, it is expensive. Over 90 percent of infected individuals live in countries with 10 percent of world GNP. Thus the vast majority of the worlds HIV infected populations do not yet have access to this treatment. In 2002 this realization gained visibility in the western world. The major pharmaceutical companies have reduced prices and in some cases offered the drugs free to countries in need. Antiretroviral are now becoming widely available<sup>4</sup>.

In 2002, Botswana became the first country in Sub Sahara Africa to launch a national antiretroviral therapy program in its public health care sector. This was possible through a public private partnership. People living with HIV/AIDS who attended the public sector program in Botswana do not have to pay for the services offered including laboratory investigations<sup>5</sup>.

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The program started first in four sites, involving two referral hospitals and two other district hospitals. It was expanded to all the district hospitals, mission hospitals and mines hospitals by the end of 2003 taking the total number of treatment sites to 27. At present, it is being expanded to all the 32 primary hospitals in the country. 26000 people are on treatment in the public sector with 7000 people in the private sector taking the total number of eligible people on treatment to 30% of those who need therapy countrywide according to the Mackinsky report of 2000<sup>6</sup>.

One of the major complexities around HIV treatment is the strict adherence required for the treatment to be effective. Adherence levels of 95 percent or more are required for continued viral suppression and to prevent drug resistance through multiplication of mutant viruses<sup>7</sup>.

Adherence concerns have been one of the reasons expressed by opponents of using antiviral in developing countries or resource poor settings. Harries et al argued that adherence is a perceived significant barrier to the delivery of ARV therapy in Sub-Saharan Africa. They submit that “unregulated access to antiretroviral drugs in sub Saharan Africa could lead to the rapid emergence of resistant viral strains, spelling doom for the individual, curtailing future treatment options, and leading to transmission of resistant virus. There are few physicians skilled in the use of antiretroviral drugs. The health infrastructure is incapable of monitoring viral load, immune status, or side effect of the drugs. Drug procurement and distribution systems are weak, and drug interruptions are likely. Thefts of drugs from health institutions for sales in the market, shops, and private clinics and across national borders are a real concern. There is no monitoring system in place to check on adherence or drug effectiveness”<sup>8</sup>.

The research proposal aims to study the factors that promote high adherence levels among patients taking antiretroviral therapy in the public sector hospitals to gain insight into the issues and behaviors of patient who achieve very high levels of adherence to shade more light into how they are able to achieve such ARV adherence in a resource limited setting such as we operate. It also aims to provide a basis for the design of a well-researched and evaluated intervention to assist those who are not achieving enough adherences for optimum clinical outcome. This study is submitted for research funding to W.H.O and is to be carried out in one year. Four sites were chosen using convenience

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sampling to participate in the study. One is situated in the southern part of the country, two in the north central part of the country and one in the far north of the country.

Approximately 7000 patients are receiving treatment in these four sites.

As the world gears toward increasing access to antiviral in developing world it is critical to understand factors that influence adherence to Antiretrovirals [ARV] (motivators and barriers) and apply the lessons learnt in improving existing programmes and upcoming ones.

## **2. Research objective.**

The objectives of this study are to determine the factors, which influence adherence to antiretroviral therapy in patients receiving ARV from the public sector in Botswana.

The focus of the study shall be on the client who fall into the extremes of the adherence chart with view to finding out what motivates and sustain good adherence on one hand and contrasting it with reasons given by clients who adhere poorly.

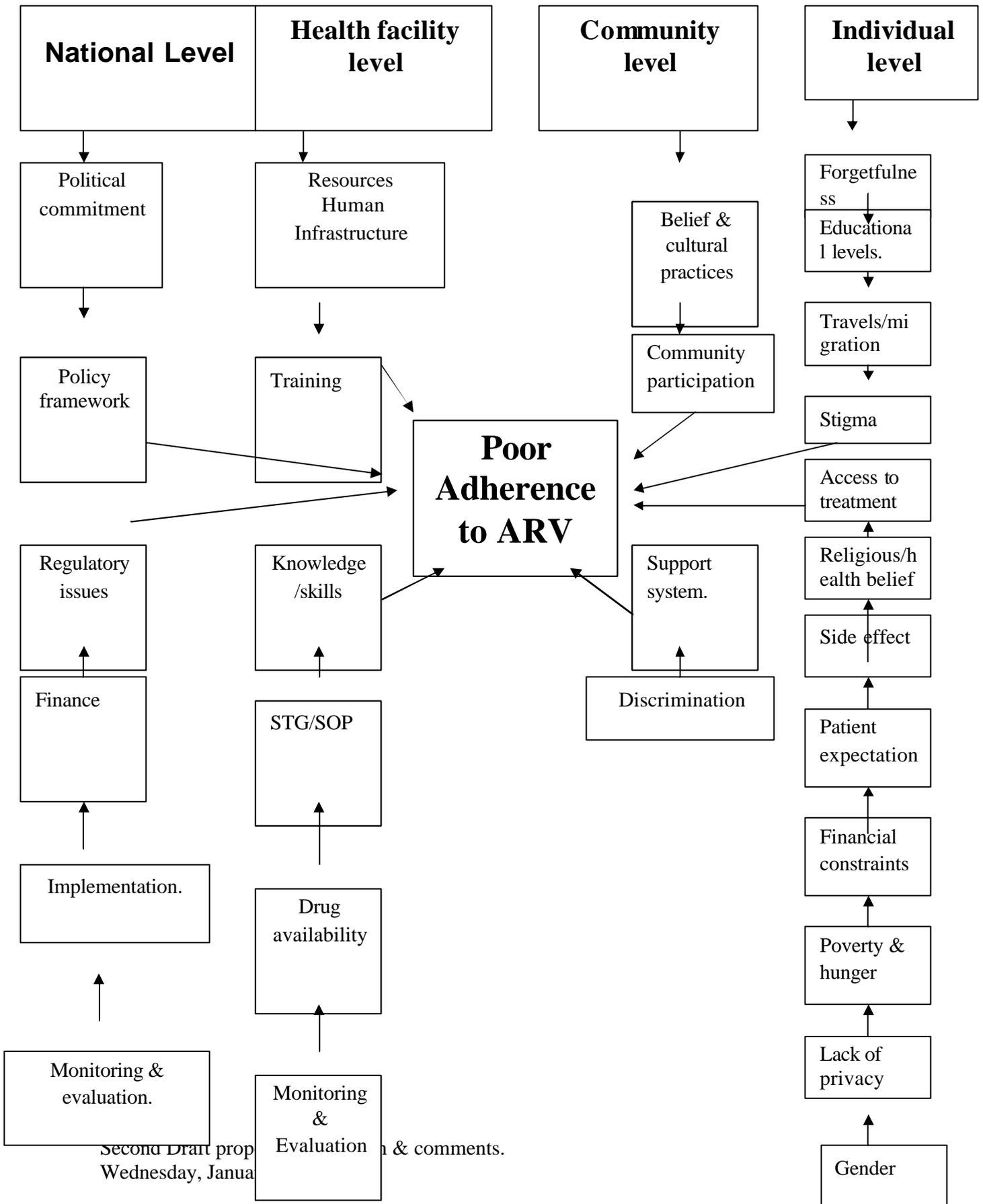
From the diagram of the problem analysis below, various factors have been identified that could influence adherences. These ranged from factors at National levels involving Political commitment, policy framework, regulatory framework, and budgetary constraints to those at the health facility level, involving infrastructural, Manpower involving- human resource, training, knowledge, skills and presence or absence of standard treatment guideline/ standard operating procedures. Community level influences include cultural and social practices, belief systems, community mobilisation and participation, and support system within the community for PLWHA while at the levels of the individual, a varied and diverse numbers of factors have been identified amongst which are sociodemographic factors, migration, stigma, access, belief, poverty, lack of privacy, gender, hunger etc.

A number of factors that operate at the national, health institutions, community and individual levels shall be examined in this study and some of the factors shall be tested by a hypothesis to verify any statistically significant relationship.

## **3.Problem diagram analysis.**

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## 4. Background

The dramatic reduction in HIV associated morbidity and mortality since the wide spread introduction of highly active antiretroviral therapy [HAART] is well recognised in all countries where such therapies have been made available<sup>9,10</sup>. However it is also noted in the British HIV Association (BHIVA) guideline “that extremely high levels of adherence to such therapies, which may often be complex in terms of pill burden dietary restrictions and dosing frequency are required to ensure optimal benefit.”<sup>11</sup>

In the presence of sub optimal therapy HIV selects for resistance rapidly<sup>12</sup>.in part due to rapid and error prone replication.<sup>13</sup>.but often aided by the low genetic barrier of several antiretroviral agents to resistance<sup>14</sup>. Though effective adherence levels have not been fully defined for HAART, levels of adherence below 95 percent have been associated with poor virological and immunological response<sup>15</sup>Other data suggest that levels of 100 percent achieve even greater benefits<sup>16</sup>The consequences of low adherence are serious for the individual, public health and for the optimal use of limited health care resources. It is now well established that the viral suppressing effect of HAART requires strict adherence to prescribed schedules. It is essential to reach and maintain therapeutic levels of these drugs and strict adherence is particularly crucial for preventing the development of resistance viral strain. Treatment resistance can occur for an entire class of antiretroviral and ultimately renders HAART ineffective. In addition, treatment resistant viral strain of HIV can be transmitted to newly infected individuals who will therefore have fewer effective treatment options from the start of their HIV infections. Multi-drug resistance usually arises from suboptimum HIV treatment adherence. Incidence of individuals becoming infected with HIV strains that are already resistant to specific medications and whole classes of antiretroviral are being documented with increasing frequency<sup>17</sup>. The implications of non-adherence to HAART on public health cannot be over emphasised because choices of therapy are limited, the cost limiting and if wide spread resistance emerged treatment would be very difficult.

Lack of strict adherence to highly active antiretroviral therapy (HAART) is considered to be one of the key challenges to AIDS care worldwide. Estimates of average rates of non-adherence with ARV therapy range from 50 % to 70 % in many different social and

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cultural settings, and the risk associated with non-adherence are extensive at both individual and societal levels<sup>18,19</sup>

Little is known about rates of adherence and factors that influence adherence to antiretroviral therapy in Africa. There are few research reports about adherence among patients receiving HAART from the public sector in Botswana. A Study conducted on private sector patients by Sheri Weiser et al put adherence levels at 54 %, (54 % of patients were found to be adherent by self report, while 56 % were adherent by provider assessment.) Observed agreement between patient and providers was 68 %. The Principal barriers to adherence included financial constraints (44 %) stigma (15 %), travel/migration (10 %) and side effects (9 %). The study also found that on the basis of logistic regression, if cost were removed as a barrier adherence is predicted to increase from 54% to 74 %<sup>20</sup> With the rollout of antiretroviral therapy in the public health sector at no cost to the beneficiaries' we would expect the levels of adherence to be much better than the earlier study.

Data presented in a subset of patients receiving ARV'S from one of the public health facilities in Botswana revealed that when using the strict definition of adherence as fully 100%, 176 patients were adherent for 83 % of the time (on average, patients took their medication in exactly the way prescribed in 24.5 days of each month). Once cost was removed the leading barriers to adherence became forgetfulness (26 %), access to the site /drug (20 %) and lack of privacy, (18 %)<sup>21</sup>

The role of socio-demographic characteristics such as gender, race age, exposure category, and educational level as predictors of adherence have produced largely inconsistent results.<sup>22</sup>The desire to ascribe low adherence to (often deprived) social groups is a well established trend in the general literature dating back to nineteen hundreds when tuberculosis control occupied public health officials.<sup>23</sup>However as later experience with antibiotics would demonstrate, low adherence is not restricted to certain social classes but is wide spread and unpredictable<sup>24</sup>Research in the HIV field supports this perspective. Moreover adherence rates vary not just between individuals but also within the same individual overtime<sup>25</sup> Adherence is therefore best thought of as a variable behaviour rather than as a stable characteristic of an individual. Most people will exhibit low adherence some of the time<sup>26</sup>

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The British HIV Association (BHIVA) & British association for sexual health and HIV (BASHH) guidelines on provision of adherence support recognises the following factors which can have influence on adherence to ARV-“Cultural and socio-economic issues have great potential to impact on adherence. For example religious beliefs around illness and medication may influence motivation and adherence.

Medication use may disclose HIV status; poverty may prevent individuals from following dietary advice; drug and alcohol use may impair judgment and the ability to adopt and maintain routine medication use; family responsibilities may require adults to place the health care needs of others before their own”.

Psychological factors; mental health problems such as depression have been associated with low adherence in HIV positive adults and adolescents as have other psychological variables such as perception of ones ability to follow a medication regimen, or self efficiency <sup>27,28,29,30</sup>.

Health beliefs: beliefs about health and illness in particular about the necessity of medication to ward off illness and concerns about its potential adverse events have been found influential in both HIV and other disease areas<sup>31,32</sup>.

The effect of symptom experiences and views about medications may be complex. Symptoms may stimulate medications use by acting as reminder or reinforcing beliefs about the necessity for treatment. However, patients’ expectations of symptoms relief are also likely to have an important effect. This could be problematic if expectations are unrealistic, or where treatment is given for asymptomatic disease, as occurs with HIV infection <sup>33</sup>

In addition patients concerns about HAART potential harm may be entirely rational and indeed Horne and colleagues have proposed that for some individuals missed doses may be a logical attempt to moderate this risk by taking lesser medications. <sup>34</sup>

Patients Education: Patients who understand the rational for anti-HIV therapy and treatment failure report higher adherence levels than those without this information. <sup>35,36</sup>

Reinforcing information provided verbally with written information to take home and by checking that information delivered has been heard correctly is likely to be beneficial as patients commonly misunderstand their health care provides instructions. One study

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found that 13% of patients prescribed HAART were not taking their medication correctly despite believing that they were.<sup>37</sup>

## **5. Definition of concepts**

### **5.1.1 Adherence to Antiretroviral therapy**

The purpose of this study is to investigate the factors that influence adherence to antiretroviral therapy, what motivates high adherence and what constitutes barriers to high adherence. Adherence is defined in the Kitso training manual of Harvard institute in Botswana as the extent to which a client's behavior coincides with the prescribed health care regimen as agreed through a shared decision making process between the client and the health care provider".<sup>38</sup>.

For the purpose of this study, adherence shall be defined as the use of antiretroviral at the right dose, at the right frequency of dosing and at agreed times. Ability to keep to this pattern of utilization shall be defined as 100% adherence, while adherence including  $\geq$  95% shall be accepted as high adherence. Levels of adherence between 85% and 94% shall be considered as moderate, with levels below 85% considered low.

### **5.1.2 Knowledge about HIV and Antiretroviral therapy.**

The Oxford dictionary defines knowledge as the information, understanding and skills that is gained through education or experience.

For the purpose of this study, knowledge shall be assessed in terms of what HIV is, how it can be transmitted, what antiretrovirals do, how are they supposed to be used and if the users know that ARV do not cure and are supposed to be taken for life.

The level of knowledge shall be graded on a scale with higher numbers depicting higher levels of knowledge.

### **5.1.3 Belief system**

Belief is defined by Oxford dictionary as strong feeling that something/somebody exists or is fine; confidence that something/somebody is good or right. It derives from the culture and experience of a person or a group. Belief systems have a great potential to impact on adherence to ARV.

Religious belief around illness and medication use may influence motivation and adherence. Belief about health and illness in particular about the necessity of medication to ward off illness and concerns about its potential adverse effects may influence adherence.

**5.1.4 Drug side effects** for the purpose of this study shall be categorized into patient/ user and biomedical perspectives. Where pills are missed because a patient presumes through knowledge that it might be responsible for certain symptoms that are not measurable will be classified as patient/ user perspective, while those instance where side effects can be recordable and assessed in observable terms will be regarded as biomedical perspective.

**5.1.5** Disclosure for the purpose of this research shall be deemed to have taken place if a patient on ARV has shared his or her status and the fact of being on treatment with at least a friend and or any other person (including family members) for the purpose of deriving support should it be needed.

**5.1.6 Cost of treatment** has been cited in the study done by Weiser et al as the major reason for low adherence to ARV in Botswana, at the time of their study, patients paid for the cost of medication and laboratory investigations but the population under study here bear none of such costs, therefore for this study cost shall be restricted to transportation costs to health facility, lost income where applicable and extra cost of feeding outside the home.

## 6. Research problems and hypotheses

The research problem is concerned with the consequences of low adherence to ARV especially as the scale of their use increases. Skeptics had suggested it might never be possible in resource-constrained settings especially in the developing world with poor health care infrastructure and personnel constraints to treat HIV/AIDS patients with ARV.

Review of current information suggests that a multitude of influences impact on adherence to antiretroviral therapy. The hypotheses for this research are therefore set forth with these influences in mind. These influences as they operate at the different levels of influence have been outlined in the problem analysis diagram.

(See page-3)

H1- There is positive relationship between high adherence to ARV and viral suppression in patients on HAART.

H2- There is positive relationship between knowledge about HIV and antiretroviral therapy to adherence to ARV.

H3- There is positive relationship between religious belief around illness and medication use.

H4- There is negative relationship between side effects attributed to ARVs and adherence to ARV.

H5- There is relationship between cost and adherence to ARVs.

H6- There is relationship between fear of discrimination and stigmatization to adherence to ARV.

H7- There is positive relationship between family, group or other social support to adherence to ARV.

H8- There is positive relationship between health worker training and adherence to ARV by the patient they care for.

H9- There is strong relationship between the quality of care given at health facility and adherence to ARV.

## **7 Research methodologies**

### **7.1 Research design.**

Since, the aim of the research is to investigate the factors, which impact on adherence to ARV (motivators and barriers), a rapid appraisal using multiple methods shall be employed. The research shall use both qualitative and quantitative methods.

The Quantitative method includes retrospective review of patient medical records to extract baseline data on CD4 and viral load. Suppression of viral load shall be considered as an indicator of high adherence while non-suppression will be considered as an indicator of low adherence. Simple ranking will be used to group patients into high adherers and low adherers. Pharmacy refill register and patient appointment register shall be used for purpose of validating the adherence levels as collated from the viral suppression.

Qualitative methods to be used will include focus group discussions with patients on HAART. Baseline data on CD4 and viral load, Pharmacy refill register and patient appointment register shall be used for purpose of selecting the participants for the focus group discussion. Participants will be selected from the two extremes (high adherers and low adherers) for focus group discussion. It will also involve semi-structured interviews with health workers, with people living with HIV/AIDS who are receiving treatment from the selected site, observation of the health workers at work (in order to avoid bias investigators will observe sites other than where they work primarily); Simulated patient visit will also be carried out as part of the observation of health care providers and focus group discussions with community members.

### **7.2. Sampling / Data collection**

The sample population shall be drawn from a group of patients receiving antiretroviral therapy from 3 selected public health institutions in Botswana, the HIV support group of the hospital as well as any organization of People Living with HIV/AIDS (PLWHA) group in the sub-districts where the research will be taking place.

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For Qualitative data collection, Semi-structured interview will be administered to 10 patients (5 men and 5 women PLWHAS), 2 persons per day within a selected week per participating site. Semi structured interview shall be administered to 4 health care workers working in the ARV treatment program and 4 community members who are not on ARV treatment within the locality of the health facility at each site.

Focus group discussion will be organized for high adherers and low adherers, males and females shall be put into different groups of 6-8 persons per group per site.

Focus group discussion will be organized at the community level with a view to finding out community perceptions and beliefs about HIV/AIDS and ARV as well as their perception of factors affecting adherence to ARV. This will involve two groups, one for males and another for females to give a total of two focus groups per site for the community members. Exit interview on twenty patients who attend the ARV clinic to receive treatment shall be done at each site.

Four Observations of health care workers and health facility will be conducted to reconcile knowledge and practices at each site. An associate researcher will travel to a chosen site to conduct the observation of the health care workers and carry out an assessment of the facility.

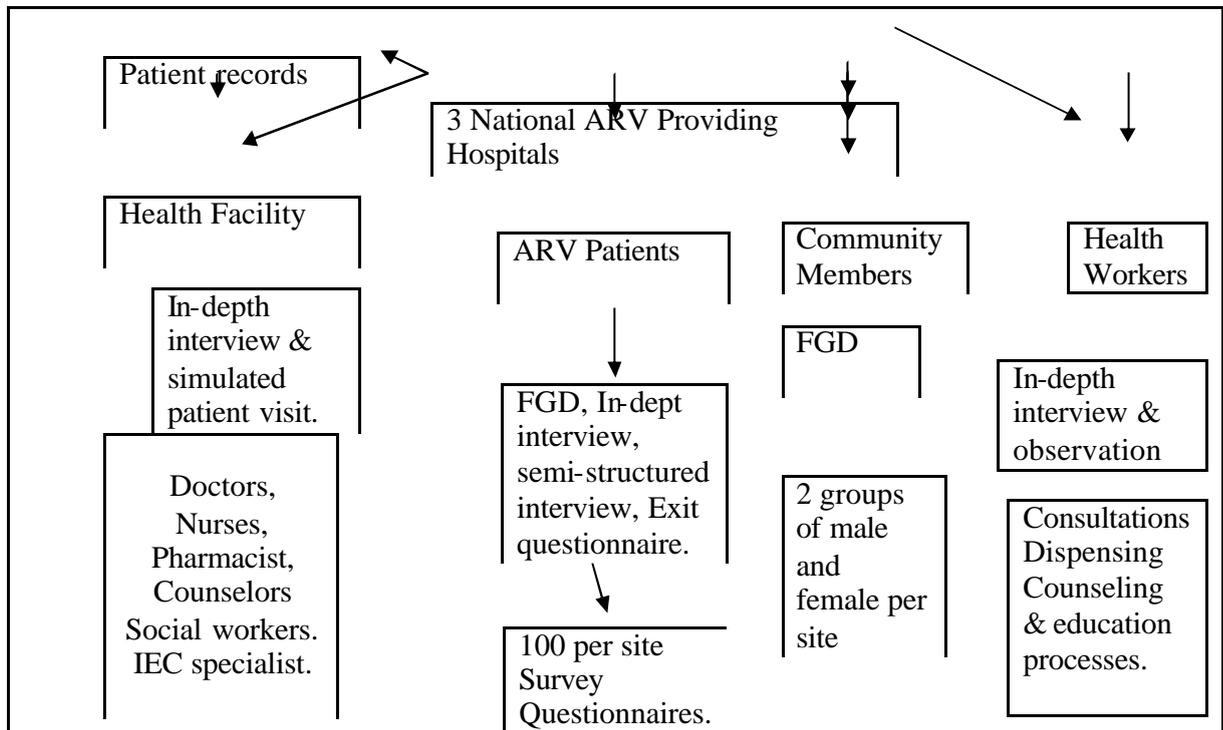
In each site, two participants each from the high adherers and poor adherers will be observed over a period of a day or two to study what they do to ensure high or poor adherence and how they do it.

Quantitative data collection

The qualitative data collected will be analyzed with a view to gain understanding of the Who, how, why and how patients cope with adherence to ARVS. It will also form the basis for generating a survey instrument (Questionnaire) that will capture the quantitative findings into themes for quantitative analysis of the extent of influence individually and collectively. This will be developed and administered to 100 patients receiving antiretroviral therapy using systematic sampling per site. The purpose of this questionnaire is to generate data to test our hypothesis to find out any association with the various variables.

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### 7.3. Summary of data collection methods. Figure 2



## 8. Data analysis

Qualitative data will be consolidated using data matrices. Analysis shall be done using triangulation based on major themes or constructs.

Quantitative data will be analyzed using excel or EPI info. Summary tables will be generated using gross tabulations comparing adherence to the various research hypotheses.

## **9. Ethical considerations.**

Approval from the health research unit of the Ministry of Health Botswana and the selected institutions management will be sought (done). Approval from the Health research unit charged with reviewing and approving as well as monitoring all researches conducted in Botswana shall be sought.

Informed consent of participants will be the only condition for enlisting participation. Information gathered shall be treated as confidential and will be accessible only to the researchers (principal investigators, associates and data analysts) who shall be responsible for its safekeeping. There shall be anonymity in reporting findings and feedback to Ministry of health research unit and participating institution(s). The stakeholders shall be engaged throughout the duration of this study, updating them with the study findings and working with them towards development of acceptable and workable intervention that will improve adherence to ARVs. The participants to be followed up and observed shall be compensated for any to ensure full cooperation and full involvement in the study for the period of observation.

## **10. Expected results**

Previous research shows that our understanding of factors associated with high adherence are less clear, and the literature concerning interventions to promote adherence to ARV is remarkably scarce. It is hoped that the outcome of this research will help policy intervention towards improving adherence to ARV through carefully planned and evaluated interventions to improve the quality of medication discussions and care so that both patients and care providers receive and understand the information they need, enable patients to accurately assess their readiness to initiate and adhere to ARV, identify gaps between knowledge and actual practice both for health workers and PLWHA. For instance where policy is found to be impacting negatively on adherence, advocacy will be used to push for policy change. Also, health facilities will be able to apply findings of the research towards improvement of service delivery, for example if patients complain about workers attitude or layout of service delivery point these could be addressed within the

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limits of individual institution. Where community perception is found to be wrong and impacting negatively on adherence then custodians of culture and influential community people can be used to communicate proper information and seek appropriate change in attitude.

## **11. Conclusions and recommendations**

Given the present low level of understanding in Botswana of the influences of adherence, it is worthwhile to mention that adherence is not an event but a process that is always in dynamism with other factors (psychological, socio-cultural, economic and state policy), therefore there is a need to continuously evaluate these factors with a view to supporting patients on chronic therapy to find ways of maintaining high adherence. The patient will benefit as well as the community at large.

Finally it is hoped that this work will enable the development of group specific interventions to improve adherence to ARV.

## **12. Technical Support Requested**

Technical support for the following activities will be needed.

1. A social scientist to assist with design of the questionnaires and other aspect of the research.
2. Development of questionnaires /instruments for the research as well as the Revision and editing of questionnaires.
3. Data analysis.
4. Report writing and preparing articles for publication.

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35. Anderson W and Weatherburn P. Taking heart? The impact of combination therapy on the lives of people with HIV (phase 2). London: Syria research 1999.
36. Tuldra A, Fumaz CR, Ferrer M. Prospective randomized two arms study to determine the efficacy of a specific intervention to improve long term adherence to highly active antiretroviral therapy. J Acquired Immune Deficiency Syndrome 2000, 25: 221-8.
37. Bargsberg D R, Perry S, Charlesbois ED. Adherence to HAART predicts progression to AIDS. 8<sup>th</sup> conference on retroviruses and opportunistic infections, Chicago, 2001, abstract 483.
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39. Kerlinger, F.N (1992). Foundations of Behavioral Research (3<sup>rd</sup> ed), Orlando: Harcourt Brace.





Project Date	Pre intervention study- factors that influence Adherence to Antiretroviral drug in Botswana 17 <sup>th</sup> Nov 2004		Principal Investigator	Joyce Kgathlawane		P 4.684 = U.S. \$ 1.00 <sup>1</sup>
Budget Category	Unit Cost (local currency)		Multiplying Factor	Total Cost (local currency)	Total cost (US \$)	Total Cost (US \$)
1.) Personnel						
1 Principle Investigator	99 <sup>2</sup> /day		20 Days	P1980	\$ 422.72	
3 Research Associate(s)	99 /day		60 Days	P 5940	\$ 1268.15	
Consultants (statistics, sampling, etc.)	180 /day		15 Days	P 2700	\$ 576.43	
Review Panel (Indicator Std.) @ per site.	99 /day		8 Days	P 792	\$ 169.01	
Secretarial Support				P 570.55	P11982	\$ 2558.07
						\$ 2558.07
2.) Transport						
Vehicles	7 /km		560 Km (return)	P 3920	\$ 836.90	
Rental <sup>3</sup>	3.03 / Km		1000 Km (return)	P 3030	\$ 646.88	
Fuel <sup>4</sup>						\$ 1483.783
Public Transport						
Mini-bus	/ Trip		Trips (return)			
Train	/ Trip		Trips (return)			
Airtfares						
Local	/ Trip		Trips (return)			
International Travel (Present Results)	/ Trip		Trips (return)			

3.) Field Allowances (Food, lodging, incidentals)

Principle Investigator	360 <sup>5</sup> / Day	10 Days	P 3600	\$ 768.57	
Research Associate(s)	360 / Day	12 Days	P 4320	\$ 922.29	
Consultants (sampling etc)	360 / Day	6 Days	P 2160	\$ 461.14	
Field Supervisor(s)	99 /day	60 Days	P 5940	1268.15	
FGD Moderator(s)	99 /day	16 Days	P 1584	\$ 338.17	
FGD Recorder(s)	99 /day	16 Days	P 1584	\$ 338.17	
Interviewers	99 /day	16 Days	P 1584	\$ 338.17	
Data Collection Staff (Quant.)	99 /day	30 Days	P 2970	\$ 634.07	
Surrogate Patients (followed-up)	99 <sup>6</sup> / Day	8 Days	P 792	\$169.09	
Review Panel (Indicator Std.)	99 /day	8 Days	P 792	\$ 169.09	\$5406.92
			P225326	5406.91	

Budget Category	Unit Cost (local currency)	Multiplying Factor	Total Cost (local currency)	Total cost (US \$)	Total Cost (US \$)
4.) Other Direct Costs					
Stationary Supplies					
Paper	45 / Ream	10 Reams	P 450	\$ 96.07	
Envelopes	40 / 100	1 Envelopes	P 40	\$ 8.54	
Postage	2.50 / Letter	50 Letters	P 125	\$26.69	
Typewriter ribbons	/ Ribbon	Ribbons			
Communications					
Telephone (internal)	100 / Month	12 Months	P1200	\$ 256.20	
FAX expenses (internal and International)	*7 / Month	Months		*7	
Interview and FGD Materials					
Tape recorder	Each				
Tapes & batteries	80 Each	4 Group	P 320	\$68.32	
FGD refreshments	100 / Group	16 Groups	P1600	\$ 341.59	
Extensionjhxgd9dydwydeh7ey7d	Each	Cords			

8						
Survey Materials						
Surveyor training materials	297	/surveyor	4	Interviewers	P1188	\$ 253.63
Printing of Survey Instruments pa/	0.65	/form	600	Forms	P 390	\$ 83.26
Clipboards & bags for interviewers	100	/team	4	Reams	P 400	\$ 85.40
"show card" materials (e.g., cardboard, pictures)		/Interviewer		Interviewers		
		/Interviewer		Interviewers		
Computing Expenses						
Purchase of computer & printer		Each unit		Units		
Disks, printer inks	432 <sup>B</sup>	Each unit	4	Units	P 1728	\$ 368.92
Printer Paper	100	/box (2500)	4	Boxes	P 400	\$ 85.40
Data Entry & Verification Services	1.50	/form	600	Forms	P 900	\$ 192.14
Software (list packages needed)		/package		Packages		
					P 9941	\$ 2122.33
						\$11571.68

Note:

1. Standard chartered Bank Botswana Exchange rate for Dollar (0.2235) dated 03/11/04.
2. Government approved daily rate for all officers on official duty per day.
3. Avis Rental rates for vehicle hire per day
4. Government rate for fueling of car per kilometer.
5. Quotation for a day for accommodation, feeding and incidentals (average government rate for a day) Mahalapye district Administration Office.
6. Possible cost to follow-up patient
7. \* Comment adopted as advised.
8. Price of a combination of black and white and colored ink cartridges from incredible connection computer shop, River walk, Gaborone. 15<sup>th</sup> Nov 2004.
9. 5% overhead = \$578.55
10. 10% overhead = \$ 1157.17
11. Total budget = \$13,306.43