Determinants of Non-Adherence to Antiretroviral Treatment Among HIV Positive Adolescents in the Mining District of Sanyati, Mashonaland West Province, Zimbabwe, 2019

By

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DECLARATION

I certify that this dissertation is my original work and submitted for the Master in Public Health program. It has not been submitted in part or in full to any university and/or any publication.

Student:

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I, having supervised and read this dissertation, I am satisfied that this is the original work of the author in whose name it is being presented. I confirm that the work has been completed satisfactorily for presentation in the examination.

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ABSTRACT

Determinants of Non-Adherence to Antiretroviral Treatment Among HIV Positive Adolescents in the Mining District of Sanyati, Mashonaland West Province, Zimbabwe, 2019

Background: Adherence to ART in Mashonaland West province was 84% in 2018, lower than the 95% target recommended by the World Health Organisation. Among the seven districts in the province, Sanyati district had the lowest adherence rate of 85% in 2017 and 76% in 2018 across all age groups. This was particularly the case among adolescents where adherence was 90% in 2017 and droped to 84% in 2018. This study therefore assessed factors associated with non-adherence to antiretroviral therapy among adolescents living in the mining District of Sanyati.

Method: An analytical cross-sectional study was conducted in Sanyati District amongst 256 randomly selected HIV positive adolescents. Interviewer-administered questionnaires were used to collect data. Univariate, bivariate, stratified and stepwise backward logistic regression analysis were perfomed.

Results: Independent factors associated with non-adherence to antiretroviral therapy were participating in artisanal mining for >50 hours per week with (aOR=6.24 CI=1.87-11.25), having good perceived ART benefits (aOR=0.11 CI=0.03-0.46) and failure to disclose HIV status (aOR=8.30 CI=1.86-37.09). **Conclusion:** In this study, adolescents who were participating in artisanal mining for >50 hours per week, who were using alternative HIV treatment methods and those who failed to disclose taking of ART medicines to friends or family members were more likely to be non-adherent to ART. Sanyati District has to come up with Adolescents community

ART refill groups (ACARG) and to produce and procure IEC material on HIV management and ART specifically for adolescents.

Key words: Non-Adherence to ART, adolescents, Analytical cross-sectional, Sanyati District

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HIV	Human Immunodeficiency Virus
ART	Antiretroviral Therapy
WHO	World Health Organisation
CD4	Cluster of Differentiation
PLWHIV	People Living with Human Immunodeficiency Virus
ARV	Antiretroviral
RNA	Ribonucleic Acid
DNA	Deoxyribonucleic Acid
UNIAIDS	Joint United Nations Programme on HIV and AIDS
DAAC	District AIDS Action Committee
HAART	Highly Active Antiretroviral Therapy
TB	Tuberculosis
FDC	Fixed Dose Combination
MCRZ	Zimbabwe Medical Research Council
JREC	Joint Research Ethics Committee
MOHCC	Ministry of Health and Child Care

CHAPTER 1

Introduction

World Health Organisation(WHO) (2016) defines Human Immunodeficiency Virus(HIV) treatment non-adherence as the process which an individual fails to keep all medical appointments and fails to take HIV medicines every day and exactly as prescribed by clinicians (1). There are over 34 million people living with HIV globally with five million being adolescents. Eighty two percent of the adolescents living with HIV are in Sub-Sahara Africa (2). According to WHO (2018) adolescent period is between 10 and 19 years of age with about one-fifth of the world's population belonging to this age group (3).The Joint United Nations Programme on HIV/AIDS (UNAIDS) highlighted that adolescents are the 'pivot' and the 'centre of the HIV epidemic' in many resource constrained settings with 42% of new HIV infections occurring in this age group in Sub-Saharan Africa including Zimbabwe (4).

The introduction of antiretroviral therapy (ART) has seen a reduction in AIDS related morbidity and deaths. Standard antiretroviral therapy should be made up of a combination of antiretroviral (ARV) drugs that maximally suppress HIV virus and stops the disease progression (5). ART prevents the early clinical manifestation of HIV infection or AIDS (6). Globally, ART services were introduced in 1987 with the approval of use of *Zidovudine* by WHO and the doses were mainly for adults (7). Doses for children and adolescents were not available. Prevention of Mother to Child Transmission (PMTCT) services were not available. Children who were born with HIV were thriving to grow and morbidity and mortality was high among these children before and during the adolescence stage (8). Since 1987, there have been a lot of changes in antiretroviral drugs as well as the treatment regimens. Currently doses for all age groups are now

available and this has seen improvement in the quality of life among HIV positive adolescents most of whom were born infected with HIV (9). Improvement in quality of life among HIV positive children and young adults or adolescents was necessitated by strategies which were introduced by WHO. In 2015 the WHO recommended that all people living with HIV should receive treatment regardless of their CD4 count (10).

At the beginning of the new millennium, the WHO guidelines recommended initiation of ART to individuals with CD4+ lymphocyte count of 300/microliter or less and by then ARVs were scarce in the country.. This was revised to 500/microliter and with the improvement in availability of ARVs, the treat all policy was adopted, whereby any person who tested HIV positive regardless of his or her CD4+ lymphocyte count is commenced on ART medicines. With the treat all policy, a reduction in opportunistic infections such as Pneumocystis carinii pneumonia and Tuberculosis (12).

The World Health Organization and Zimbabwe Guidelines for Antiretroviral Therapy recommended target for drug compliance to be at least 95% adherence (14). The WHO also highlighted that the use of highly active antiretroviral therapy (HAART) will assist in reducing morbidity and mortality of people living with HIV/AIDS, therefore everyone who meets the criteria for treatment with first line, second line or third line regimen should have access to those regimens (16). The WHO (2016) defined HAART as any treatment for HIV that uses two or more antiretroviral drugs (7). Once an individual has access to HAART, it is also important that he or she adheres closely to the medicines in order to maximally benefit. There are a number of adverse drug reactions following the administration of HAART. However, the benefits of HAART outweigh those events (17). Antiretroviral Therapy delays the onset of Acquired

Immune Deficiency Syndrome (AIDS) defining illnesses and the occurrence of some opportunistic infections (18). Chronic debility and death may also be delayed with effective treatment. Hence it is important to reduce non-adherence rate among HIV positive patients in a community where HIV prevalence is high.

Zimbabwe introduced antiretroviral therapy in the public sector in 2004. By, 2005, ART had been introduced in most of the public health institutions and was fully rolled out to all public health and private institutions by 2006 (11). According to the Zimbabwe National HIV/AIDS policy, the aims of ART are, maximal and durable suppression of replication of HIV, restoration and preservation of immune function and reduction of HIV-related morbidity and mortality. Other benefits of ART are improvement of quality of life and prevention of mother-to-child transmission of HIV that is vertical transmission (3).

In 2016, through the national HIV guidelines, the country introduced the test and treat all strategy in all the health facilities (12). The test and treat all strategy is a universal strategy in which all HIV infected individuals receive treatment regardless of their CD4 count levels. This strategy aims to eliminate HIV as it reduces the rate of spreading the virus to other people (7). The classes of ART medicines currently used in Zimbabwe include Nucleoside reverse transcriptase inhibitors such as Zidovudine, Stavudine, Lamivudine, Abacavir and Emtricitabine. Other classes of ART medicines which are also used in Zimbabwe are non-nucleoside reverse Transcriptase inhibitors, Intergrase inhibitors and Protease inhibitors (1). In Zimbabwe, the preferred first line regimen for adolescents and adults has tenofovir, lamivudine and dolutegravir. First line ART drugs of choice include Tenofovir (TDF), Lamivudine (3TC), Nevirapine (NVP),

Efavirenz (EFV) and Abacavir and Lopinavir in children. The recommended second line regimen for adolescents and adults if TDF was used in first line ART is AZT + 3TC + ATV/r or LPV/r and if AZT was used in first line ART, then TDF + 3TC + ATV/r or LPV/r should be used. Second line ART medicines include Zidovudine (AZT), Tenofovir (TDF), Lamivudine (3TC), Atazanavir (ATV/r), Ritonavir, Lopinavir LPV/r and Raltegravir (RAL) and Abacavir in children.Third Line ART medicines include Dolutegravir, Dirunavir, Ritonavir, Raltegravir and the preferred ART regimen for adolescents and adults in Zimbabwe is Dolutegravir and Dirunavir/Ritonavir (1). Adherence to Anti-retroviral therapy (ART) ensures optimal treatment outcomes and reduces the risk of drug resistance. For people living with HIV, treatment adherence involves keeping all medical appointments and taking HIV medicines every day and exactly as prescribed by clinicians (2).

1.2 Problem Statement

In Zimbabwe Population-Based HIV Impact Assessment report of 2016, mortality rate in adolescents was at 14.6% and the viral load suppression among adolescents was 56.9%. The viral load suppression in adolescents was the lowest among all age groups (9). World Health Organisation set ART adherence limit to be at least 95% for treatment to be effective. Adherence to ART in Mashonaland West province was 84% in 2018, lower than the 95% target recommended by the World Health Organisation. Among the seven districts in the province, Sanyati district had the lowest adherence rate of 85% in 2017 and 76% in 2018 across all age groups. This was particularly the case among adolescents where adherence was 90% in 2017 and droped to 84% in 2018. Despite the introduction of the Community Adolescents Treatment

Support (CATS) program in the district the proportion of adolescents who were not adhering to ART sharply rose from 10% in 2017 to 16% in 2018.

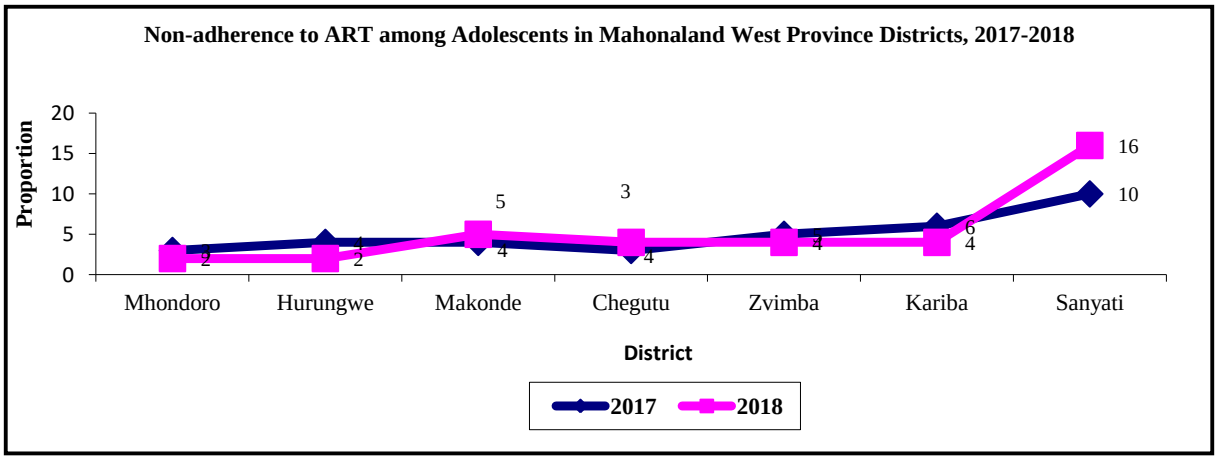

Figure 1: Non-adherence to ART among Adolescents in Mashonaland West Province Districts 2017-2018

Sanyati District is the hub of informal mining in Mashonaland West province. According to the Sanyati District 2018 annual economic progress report, adolescents and youths were the major players in artisanal mining in Sanyati District. Eighty-three percent of informal miners in the district were adolescence and youths. Sex work is common in areas where artisanal mining is present. Informal miners are highly mobile and usually camp in areas which are sometimes far away from their homes and health facilities which offer them ART services and other HIV prevention and control programmes Adolescents who engage in artisanal mining usually do not adhere to ART. Adolescents involved in artisanal mining are well known for prioritising their mining activities than taking their medication as prescribed by clinicians (13). I therefore, conducted a study to determine factors associated with non-adherence to antiretroviral therapy among HIV positive adolescents in the mining district of Sanyati.

1.3 Justification

Determining factors associated with non-adherence to antiretroviral therapy among adolescence in Sanyati District was relevant in order to provide immediate evidence-based decisions to inform HIV programming. Recommendations from this study can easily be implemented in different settings as they are among the few studies in the region focusing on adolescents in a mining environment. The determinants of non-adherence to ART among adolescents in the mining environments were not known, hence this study will try to established these determinants and targeted interventions to promote adherence to ART will be recommended. Suuccessful completion and implementation of recommendations from this study will likely to assist in averting exobirtant costs associated with the acquisitaion second and third line ART medicines. Costs will be reduced if recommendations as a result of this study are implemented and if they positively impact on first line treatment adherence. The study may also add to the limited body of knowledge on determinants of non-adherence to antiretroviral therapy among adolescents in Zimbabwe.

CHAPTER 2

Literature review

The literature review was obtained from journals through Google search, HINARI, Pub med, Medline databases of similar studies that were done in other countries. As different studies were being reviwed, the following key words were used: non-adherence, adherence, antiretroviral therapy and adolescents.

2.1 Socio-Demographic Related Factors

In a study by National institute of Allergy and Infectious Diseases, on factors attributing to ART non-adherence and defaulting among adolescents in Namibia, highlighted that high non-adherence and defaulting rates were associated with orphaned adolescents and those adolescents who were chronic alcohol consumers (19). Bauleth et.al also highlighted that ART non-adherence was associated with being male sex with OR = 3.23 (CI: 2.15-7.26).

Economic status can affect how an individual takes his or her own ART medicines. Semvua *et.al* highlighted poverty and low income status as major barriers to antiretroviral adherence among adolescents in Tanzania. Adolescents from low income families sometimes fail to raise bus fare for travelling to and from health facilities where they access their antiretroviral medicines (20). The same study by Semvua *et.al* also found a significant association between non-adherence to ART and being an orphaned adolescent with odds ratio of 4.23 (CI= 2.41-6.23). In a study on High self reported non-adherence to antiretroviral therapy amongst adolescents living with HIV AIDS in Malawi, Malawi, Kim *et.al* pointed out multiple reasons for failing to adhere to ART (21).

The major economic factor which was contributing to non-adherence to ART among adolescents was poverty. Poverty and lack of empowerment were significantly associated with non-adherence to ART among adolescents with odds ratios of 2.3 (21).

Peltzer K et.al highlighted that non-adherence to ART among adolescents is common in areas where child labor is common (22). The study pointed out that non-adherence due to child labour was common in the mining sector, especially in the subsector of artisanal and small scale mining. Lack of opportunities and poverty among adolescents were cited as most drivers of child labour.

2.2 Health Services Related Factors

In a cohort study conducted by Shukla *et.al* in India, on non adherence to ART among people living with HIV/AIDS attending two tertiary care hospitals in district of northern India, the factor most frequently reported by 61% of the respondents as a barrier to treatment adherence, was long travelling distance to the health facilities. Adolescents also cited high transport costs to their health facilities to collect medicines as one of the contributors to non-adherence to ART (23). This study explored on health services related factors like accessibility of health facilities by adolescents as Sanyati District, had poor road network and some of the roads were not usable during the rainy season. There was no evidence on any study that tried to find health services related factors associated with non-adherence to ART among adolescents in a mining district.

In consistence with Shukla *et.al*, Wang *et.al* also highlighted some of the health services related factors promoting non-adherence to ART. In the study 87% of the respondents cited long waiting hours at clinics, long distance of more than 10Km to health facilities and staff shortages in some

health facilities as some of the factors affecting adherence to ART (24). Distance to the nearest health center, medicines availability and poor integration of ART and HIV testing and counselling services are some of the health services related factors associated with non-adherence to ART among adolescents (24). This study also focused on waiting period by adolescents who access their ART medicines in Sanyati District health facilities, distance which the adolescents were travelling to and from nearest heath centers to access their ART medicines and also on how HIV testing and counselling services were integrated with antiretroviral treatment services in Sanyati as no studies have been conducted also linking these health services related factors to non-adherence to ART among adolescents in Sanyati District.

Gross *et.al* also pointed out that health workers' attitude towards adolescents has a bearing in their treatment adherence. The study pointed out that confidence and trust in providers was significantly associated with adherence in HIV-infected adolescents with OR = 2.13 (CI = 1,52 – 3.97) (25). According to Mhlanga-Gunda *et.al* confidence is a measure of self-efficacy and an important determinant of behavior as conceptualized in social Cognitive Theory. Comfort in talking with a health care worker or provider is stimulated by trust (11).

Ridgeway *et.al* highlighted that one of the health related factor promoting non-adherence among adolescents and adults in a mining community in Witwatersrand South Africa, was availability and accessibility of ARV medicines (26). In a similar study by Kim *et.al* in Malawi, 79% (135/171) of the adolescents who participated in the study cited antiretroviral shortages which were sometimes experienced by some health facilities as the major driver of non-adherence among adolescents. No evidence was available in Sanyati District on regular availability of ART

medicines, hence this study tried to find out if health facilities in the district experienced any ART medicines shortages. Antiretroviral shortages might also drive adolescents in not adhering to treatment as most of the adolescents will be left with no option than to wait until ART is available at their nearest health facility.

2.3 Individual Factors Related to Non-Adherence

In Sothern Africa Ferrand *et.al* on factors associated with non-adherence among adolescents, adolescents were not concerned about therapy and some were not carrying extra antiretroviral doses when going out of their homes for a day or more and this practice was associated with non-adherence with OR = 6.63 (CI: 1.73 – 25.47).

For successful ART adherence, HIV positive clients must be taught and assisted to include taking of their ART medicines in their daily routines. In Soweto, Hornschuh *et.al* reported high non-adherence rate among adolescents due to ART medicines side effects. In the same study, adolescents who were taking medication in an empty stomach were 2 times more likely to experience adverse effects than those who were taking their medication after eating food (27). This study tried to identify whether health workers in Sanyati District were teaching adolescents on the importance of taking their ART medicines religiously and on how to take their ART medicines.

Brechtl *et.al* noted that Pruvian adolescents who were staying in mining settings were not adhering to ART, when compared with adolescents who were not staying in mining environment with OR= 2.74 (CI = 1.22 – 5.73). The study also found that Peruvian adolescents who were

staying in mining setting were indulging in sex work earlier than those who were not staying in mining settings (17). In those mining areas girls were indulging in sex work earlier than boys. The study also found that HIV positive adolescents who were engaging in sex work were 3 times more likely not to adhere to antiretroviral treatment than those who were not indulging in sex work. Thirteen percent (93/715) of the respondents absconded school due to reasons like continuous illness, being engaged in commercial sex work some were opting to be employed as mine employees (17).

Hornschuh *et.al* in south Africa pointed out that young adults or adolescents who had multiple sexual partners were at high risk of not adhering and even default antiretroviral treatment (27). Similar findings were also found by Kim et.al who pointed out that 21% of adolescents who were indulging in risk sexual behavior in Lilongwe, Malawi were not adhering to ART medicines (28). This study also tried to explore the association between non-adherence to ART and involvement of adolescents in mining activities as no evidence was available on determinants of non-adherence to ART among adolescents in the mining district of Sanyati.

2.4 Socio-Cultural Related Factors

Socio-cultural factors associated with non-adherence to ART include fear of stigmatisation from the community, need for consent from parent or guardian to take ART medicines, some religions do not allow use of any form of medicines. In a study in East Africa, Vreeman *et.al* highlighted that 267(24%) of adolescents who participated in the study pointed fear of stigmatisation by school mates and community members as the major factor contributing to non-adherence among adolescents. The same study also found that some married adolescents were facing challenges in

communicating with their partners on antiretroviral treatment issues hence they were failing to integrate ART into their daily routine thereby promoting non-adherence to ART (29).

In a study by Vreeman *et.al* 17% of the adolescents reported that they were sometimes not willing to take their ART medicines because of fear of stigmatization by their friends, families and communities. To circumvent the challenge young adults programmes and community awareness programmes were conducted in the affected communities. These approaches aimed to reduce ART non-adherence and defaulter rate among adolescents (29). Fear of stigmatization by society among adolescents can promote non-adherence to ART as these young adults might not want the society to know their HIV status or that they are taking HIV medicines. This study explored on socio-cultural factors associated with non-adherence to ART among adolescence in the mining district of Sanyati as nothing has been done to find out if there are any socio-cultural hindrances to ART adherence in the district.

2.5 Conceptual framework

A conceptual framework developed following literature review is shown in Figure 2. Data collection tools were developed from this conceptual framework.

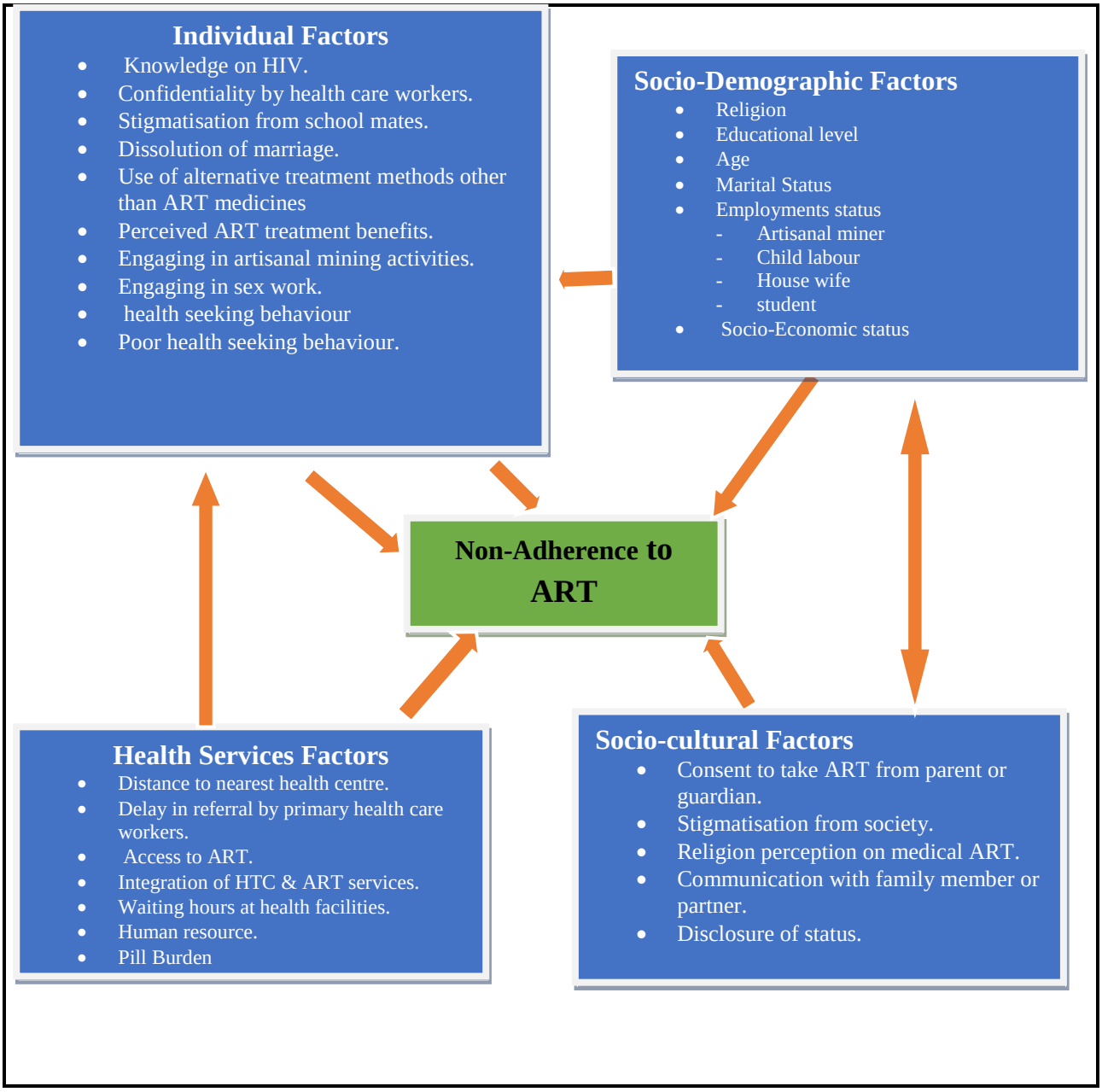

Figure 2: Conceptual Framework for Non-Adherence to ART among adolescents in the mining District of Sanyati, Mahonaland West Province, Zimbabwe, 2019

2.6 Research question

What are the determinants of non-adherence to antiretroviral therapy among HIV positive adolescents in Sanyati District, Mashonaland West Province, Zimbabwe, 2019?

2.7 Research Hypotheses

H_0: There is no association between engaging in mining activities and non-adherence to antiretroviral therapy among adolescents.

H_0: There in no association between use of alternative treatment methods other than ART and non-adherence to antiretroviral therapy among adolescents.

H_a: There is an association between engaging in mining activities and non-adherence to antiretroviral therapy among adolescents.

H_a: There is an association between use of alternative treatment methods other than ART and non-adherence to antiretroviral therapy among adolescents.

2.8 Broad Objective

The broad objective was to determine factors associated with non-adherence to antiretroviral therapy among HIV positive adolescents in the mining District of Sanyati.

2.9 Specific Objectives

The specific objectives were:

- To describe the socio-demographic characteristics associated with non-adherence to ART among HIV positive adolescence in the mining District of Sanyati, Mashonaland West Province, Zimbabwe, 2019.
- To determine the individual factors associated with non-adherence to ART among HIV positive adolescence in the mining District of Sanyati, Mashonaland West Province, Zimbabwe, 2019.
- To determine the socio-cultural factors associated with non-adherence to ART among HIV positive adolescence in the mining District of Sanyati, Mashonaland West Province, Zimbabwe, 2019.
- To determine the health system factors associated with non-adherence to ART among HIV positive adolescence in the mining District of Sanyati, Mashonaland West Province, Zimbabwe, 2019.

CHAPTER 3

Materials and methods

3.1 Study design

The investigator conducted an analytical cross-sectional study in Sanyati District amongst HIV positive adolescents. In view of that non-adherence to ART can be measured over a long period, the analytical cross-sectional study design was quick, requiring only a “one-time” examination or interview. The study design was not expensive and it was helpful in program planning and determining types of health services needed.

3.2 Study setting

Sanyati District is one of the seven districts in Mashonaland West Province of Zimbabwe. Sanyati District had an estimated population of 467 578 (Census: 2012). Health services are provided through a network of 13 rural health centres, five Kadoma City Council clinics, three uniformed forces clinics, one mission hospital and one government general hospital. All the clinics in Sanyati District provide care to HIV clients. Displayed on figure 3 is the spatial distribution of health facilities in Sanyati District where adolescents were accessing their ART medicines.

Figure 3: Spatial distribution of health facilities in Sanyati District, Mashonaland West Province, Zimbabwe, 2019

Gold mining is the main economic activity, with the biggest gold producer in the country CAM Motors mine, which is owned by Rio Tinto located in the District. Artisanal mining is also rampant in the District. Adolescents and youth are the main players in informal mining activities in Sanyati District. Sex work is also common in most of the informal mining compounds in the District. Young adults and youths sometimes miss school to engage in artisanal mining and sex work within the informal mining settings in the District.

3.3 Study population

The study population consisted of HIV positive adolescents registered and seeking care at health facilities in Sanyati District. As of December 2018, all health facilities in Sanyati District had enrolled a total of 1853 HIV positive adolescents. Sanyati District Health Executive and Director Health and Environmental Services at Kadoma City Council were recruited as key informants

3.4 Study unit

The study unit was any individual HIV positive adolescent aged 10 to 19 years who was registered and seeking care at any of the health facilities in Sanyati District.

3.5 Sample size

The investigator calculated the sample size using the Dobson formula. $\mathbf{n = [z^2 (pq)] / d^2}$

Where:

p = 0.15, which is the proportion of HIV positive adolescents who were not adhering to treatment in a study done in Soweto South Africa by Hornschuh *et.al*, at 95% confidence interval.

q = 1-p

Factoring in a 10% non-response rate, the minimum calculated sample size was 216.

3.6 Sampling

Multi-stage sampling was used to select adolescents who participated in the study. Out of the 1853 adolescents who were enrolled on ART in Sanyati District in 2018, the proportion or burden contributed to the district total by each health facility was calculated. Each facility then contributed its calculated proportion towards the sample size of 216. A list of HIV positive adolescents enrolled at each health facility were used as the sampling frame. Adolescents enrolled at each health facility were enumerated. Random numbers equal to the required proportional sample for each facility were generated from the first to the last adolescent OI

number using the randomizer social science statistical software. The proportions of adolescents at each facility and respective calculated sample sizes are displayed on table 1.

Table 1: Sampling of Health Facilities in Sanyati District, Mashonaland West, Zimbabwe, 2019

Clinic	**No of Adolescents on ART (10-19years)**	**Proportion of Adolescents** No of Adolescents enrolled at each facility divided by the total number of adolescents enrolled the whole District	**Adolescents to be included in the study**
Kadoma General Hospital	225	225/1853	26
Rimuka ITHC	347	347/1853	42
Chemukute	105	105/1853	13
Ngezi	121	121/1853	16
Waverly	271	271/1853	33
Nyahonde	21	21/1853	3
Muuyu	34	34/1853	5
Sanyati Baptist	294	294/1853	35
Patchway	78	78/1853	9
Chirikiti	41	41/1853	5
Ordoff	39	39/1853	5
Golden Valley	39	39/1853	5
New Geja	26	26/1853	3
Black Movale	31	31/1853	5
Perseverance	22	22/1853	3
Muuyu	17	17/1853	3
Jompani	52	52/1853	7
Nyamatani	36	36/1853	5
Nyabango	25	25/1853	3
Chegutu 6	29	29/1853	5
TOTAL	**1 853**		**231**

Adolescents were sampled and interviewed during their ART refill days. The adolescents were given specific dates and times in line with their ART refill days to meet at each facility and they were randomly sampled to meet the proportion of each facility. Sanyati District Medical Officer, District Nursing officer, Director Health and Environmental Services Kadoma City Council, the Assistant Director personal Health at Kadoma City council and Nurse in Charges of all the clinics were purposively recruited into the study as key informants and they were interviewed at their respective work places.

3.7 Inclusion criteria

Eligible participants were those aged 10-19 years old (Adolescents) who were on ART for at least 3 months and were enrolled on ART by 31 December 2018, registered and receiving care at health facilities in Sanyati District and who consented or consent was given by parent or guardian to participate in the study.

3.8 Exclusion criteria

Adolescents fitting the criteria but not able to give written informed consent or obtain written consent from parent/ guardian were left out.

3.9 Definition of variables

3.9.1 Outcome variable

The outcome of interest was non-adherence. In this study non-adherence was when an adolescent got a score of ≥1 on the Morisky eight item medication adherence scale (32–34).

3.9.2 Independent variables

Variables such as age, sex, occupation, engaging in artisanal mining, child labour and engaging in sex work among others were the independent variables. Independent variables are presented in table 2.

Table 2: Independent Variables for the Study of Determinants of Non-adherence to Antiretroviral Therapy among Adolescents in the mining District of Sanyati, Mashonaland West Province, Zimbabwe, 2019

Variable	Indicator	Data collection technique	Source of data
INDIVIDUAL VARIABLES			
1. Age	Age in years	Interviews Observational	Questionnaire
2. Sex	Male/female	Interviews	Questionnaire
3. Religion	Muslim, Apostolic, Pentecostal, etc.	Interviews	Questionnaire
4. Employment status	Employed/Unemployed	Interview	Questionnaire
5. Artisanal miner	Yes/No	Interview	Questionnaire
6. Involved in child labour	Yes/no	Review of medical records Review of medical records	Questionnaire
7. Knowledge on ART	Number of questions on ART answered correctly.	Interview	Questionnaire
8. Perceived benefits of ART	Number of questions on benefits of ART answered correctly.	Interview	Questionnaire
9. Disclosed HIV status	Yes/No	Interview	Questionnaire
FACILITY VARIABLES			
10. ART medicines always available	Yes/No	Interview Observation	Questionnaire Checklist
11. Distance of Health facility from community it serves	Distance to facility in kilometres	Interview	Questionnaire
12. Patient waiting time	Time spent at the health facility in hours	Interview Observation	Questionnaire
13. Integration of HTS and OI/ART services	Period between patient receiving HIV results and ART initiation	Review of medical records	Questionnaire Checklist

3.10 Knowledge

The investigator assessed knowledge using a battery of 6 questions. The questions were scored and ranked out of 6 using a Likert Scale. Any respondent who got a score of <3 was classified as having poor knowledge. Those who got a score of ≥3 were classified as having good knowledge.

3.11 Data collection

Interviewer-administered questionnaires designed in line with the conceptual framework were used to collect information on socio-demographic factors, individual factors, health services factors and socio-cultural factors. Anti-retroviral treatment registers and patient outpatient cards were reviewed. The questionnaires were translated into the local language (Shona). Pretesting of data collection tools was done at Chegutu District Hospital to assess the validity of the tools and the time required to administer the questionnaire. Qualitative data from key informants was collected using *Wordle* word cloud online software.

3.12 Adherence Assessment

Adherence was assessed using the Morisky eight item medication adherence scale. Participants were asked to complete the eight questions on adherence. Answer "yes" was carrying one mark and answer "no" was carrying zero mark for each question. Out of the 8 questions, total scores of >2= High non-adherence, 1 or 2= medium non-adherence and 0= Adherence. Adolescents who were rated to be non-adherent to ART at each health facility were referred for adherence counselling by nurses.

3.13 Stigma Assessment

To measure stigma, the Global Network of People Living with HIV Stigma Index was used. The Stigma and Discrimination Index tool had 11 questions which were clustered into five categories. The questions were assessing whether respondents' experienced self stigma or external stigma. For each question asked, answer "Yes" was carrying one mark and answer "No" was carrying zero marks. The total marks for individual respondent were converted into percentages and then rated on the global stigma and discrimination scale. The index was estimated on a scale of 0-100. Each category was equal to 20 units. The cumulative scores were then averaged to yield an overall stigma score. The extent to which adolescents in Sanyati District demonstrate stigma in each category was rated according to the score of each category. Adolescents who got zero percent were regarded as having no stigma experience, those who got <15% on the scale were rated to have experienced very low stigma, 15-29 low, 30-40 moderate, 45-59 high and >60 as very high stigma.

3.14 Data analysis, interpretation and presentation

Centres for Disease Control Epi Info7, version (7.2.2.6) statistical software was used to capture and analyse data. Checking for incompleteness and missing variables was part of data cleaning. The investigator had to run frequencies for all the variables to check for missing variables and the questionnaires was used to correct any mistakes in the consistency of data entry. The Epi info 7 software was also used to perform univariate, bivariate and stepwise backward logistic regression analysis. Odds ratios were calculated from the biravete analysis as well as their corresponding 95% confidence intervals were recorded. In this study the stratum specific odds ratios were reported, as interaction was noted. In this atudy all variables with a *p-value of* ≤ 0.25 were included in the logistic regression model. Variables with p-values of <0.05 were considered to be statistically significant. Qualitative data from key informants were analysed using *Wordle* word cloud on line software. As the responses by key informants were punched into the software, the software was automatically analysing the data by making frequencies and a cloud of most words appearing into the software as they were said by the respondents. In this study, an adolescents who scored >2 on the Morisky scale was classified under low adherence to ART, those who scored one or two, medium adherence and those who score zero they were classified under high adherence.

3.15 Ethical considerations

Ethical approvals were obtained from the Medical Research Council of Zimbabwe (MCRZ) and the Joint Research Ethics Committee (JREC). Ethical principles in human research as prescribed by the Belmont Report (1974) which was published by the Commission for protection of Human subjects of biomedical and behavioural research were applied. Respect for persons, beneficence

and justice were applied as per the Belmont report. Individuals were treated as autonomous agents. All respondents who were 18-19 years provided written individual signed consent forms. Respondents who were ≥10 to <18 years provided parent/ guardian signed consent forms before being involved as a study participant and those individual suppose to counter sign if they were willing to participate in the study. Health benefits to the participants were maximised by the provision of free adherence counseling services and some were referred when necessary. All information pertaining to the research was communicated to the respondents. All efforts and precautions were made to guarantee no risking of respondents' reputation and social standing because of participating in the study. Participants were interviewed during their ART refill days, however each participant was given a healthy drink (Maheu) and two muffins. Adolescents, who were found not adhering to treatment, were referred for adherence counseling by nurses at each clinic. All data collected was kept under lock and key and communication pertaining the study was strictly to entities who are involved in the research.

3.16 Permission to proceed

Permission to proceed with the study was obtained from Sanyati District Health Executive (DHE), the University of Zimbabwe, Department of Community Medicine and the Health Studies Office.

Chapter 4

Results

4.0 Introduction

This chapter focuses on presentation of data on determinants of non-adherence to ART among adolescents in the mining district of Sanyati in Mashonaland West province in 2019. The chapter looks into socio-demographic characteristics associated with non-adherence to ART, individual factors associated with non-adherence to ART, socio-cultural factors associated with non-adherence to ART and health system factors associated with non-adherence to ART among adolescents in Sanyati District.

4.1 Antiretroviral Treatment Adherence Assessment of Adolescents in Sanyati District, 2019

Participants were asked to complete a battery of eight questions adapted by the investigator from the adopted Morisky 8 item treatment adherence medication scale. On adherence assessment, answer “yes” was carrying one mark and answer “no” was carrying zero mark for each question. Scores of the respondents are displayed on figure 4.

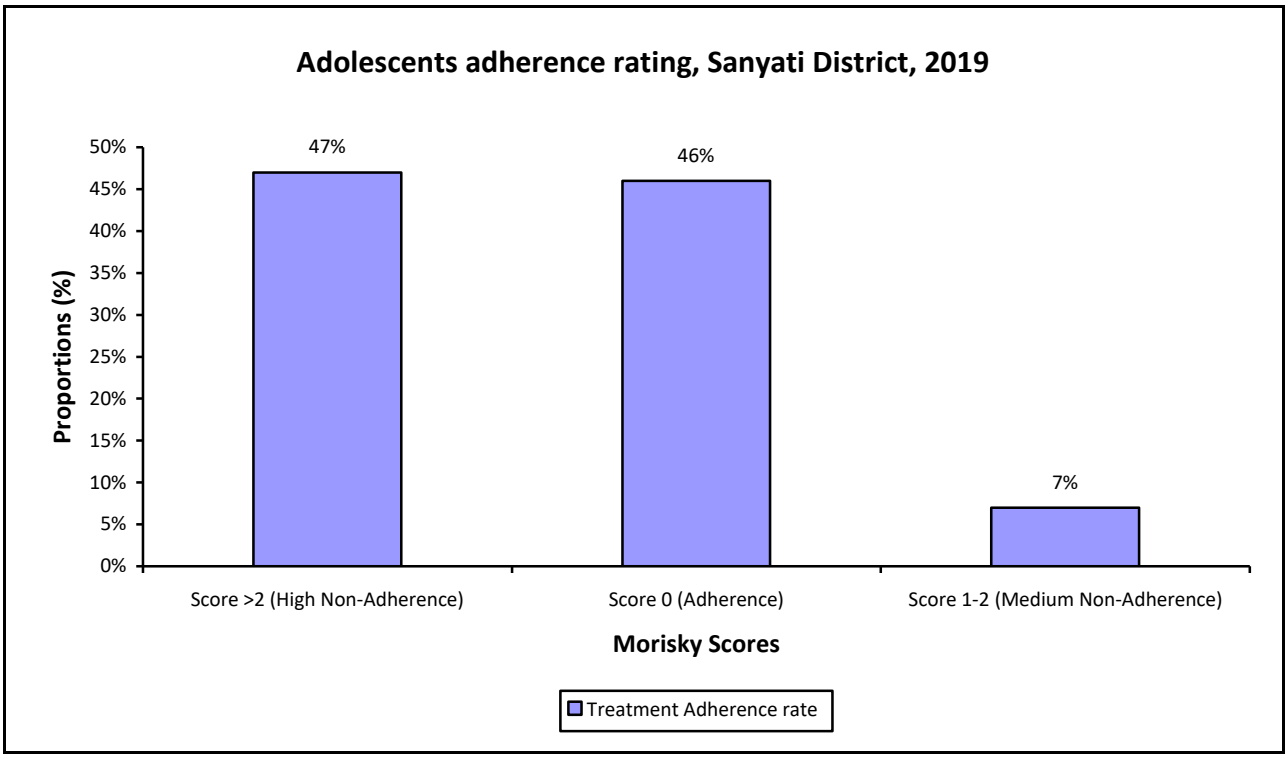

Figure 4: Adherence Rating of Adolescents, Sanyati District, Mashonaland West Province, Zimbabwe, 2019

Only 46% (117/256) of the respondents were adhering to ART and 54% (139/256) of the respondents were not adhering to ART. Forty-seven percent (120/256)of the adolescents who were not adhering to ART consisted of adolescents who scored >2, which high non-adherence and the 7% (19/256) consisted of adolescents who scored 1-2 which is medium non-adherence on the Morisky 8 item adherence medication scale.

4.2 Demographic Characteristics of Respondents

Though the calculated sample size was 231, the study successfully recruited 256 adolescents as it was not cost effective to interview fewer clients at some clinics which were far apart. The sample

size of 256 which was recruited helped in improving the statistical power of this study. The socio-demographic characteristics of the respondents are presented in table 3.

Table 3: Socio-Demographic Characteristics of Respondents in Sanyati District, Mashonaland West Province, Zimbabwe, 2019

Variable	Category	Non-Adhering to ART		p-value
		Yes n=139(%)	No n=117(%)	
Sex	Female	69(50)	52(44)	0.41
	Male	70(50)	65(56)	
Marital Status	Single	96(69)	102(87)	0.61
	Married	32(23)	11(8)	0.49
	Divorced/Separated	8(6)	3(3)	0.61
	Widowed	3(2)	2(2)	Referent
Religion	Apostolic	27(20)	12(10)	0.12
	Pentecostal	44(32)	34(29)	0.73
	Traditional mainline churches	31(22)	32(27)	0.64
	Muslim	6(4)	12(10)	0.14
	None	31(22)	27(24)	Referent
Education Level	≤Primary	100(72)	101(86)	0.01
	>Primary	39(28)	16(14)	
Employment Status	Formal	2(1)	0(0)	0.09
	Artisanal miner	88(63)	45(38)	<0.01
	Unemployed	49(35)	72(62)	Referent
Orphan Status	Double orphan	50(36)	26(22)	0.06
	Maternal Orphan	17(12)	18(15)	0.96
	Paternal Orphan	46(33)	46(39)	0.91
	Not Orphan	26(19)	27(23)	Referent
Religion	Apostolic	27(20)	12(10)	0.12
	Pentecostal	44(32)	34(29)	0.73
	Traditional mainline churches	31(22)	32(27)	0.64
	Muslim	6(4)	12(10)	0.12
	None	31(22)	27(24)	Referent
Household Monthly Income (RTGS)	≤100	66(47)	35(30)	0.004
	>100	73(53)	82(70)	
Age in years	Median age	17(Q_1=15;Q_3=18)	16(Q_1 =14;Q_3=17)	
Duration on ART	Median years	8(Q_1=5;Q_3=11)	9(Q_1=5;Q_3=12)	
Key Informants n= 31				
Age in years	Median Age	35(Q_1= 28; Q_3= 43)		
	Median years in service	11(Q_1= 7; Q_3=15)		

Among the respondents 53% (135/256) were males and 47% (121/256) were females.

Seventy nine percent (201/256) of the respondents were either doing primary education or attained primary education. Fifty two percent (133/256) were involved in artisanal mining and 47% (121/256) were not employed. The median age in years for adolescents who were not adhering to ART was 17(Q_1=15; Q_3=18) and the median age in years for adolescents who were adhering to ART was 16(Q_1 =14; Q_3=17). For the key informants the median years in service was 11(Q_1= 7; Q_3=15).

4.3 Socio-Demographic factors associated with non-adherence to antiretroviral treatment among Adolescents in Sanyati District, Mashonaland West Province, 2019

Displayed on table 4 are the socio-demographic characteristics associated with non-adherence to ART among adolescents in Sanyati District.

Table 4: Socio-Demographic factors associated with non-adherence to antiretroviral treatment among Adolescents in Sanyati District, Mashonaland West Province, Zimbabwe, 2019

Variable	Category	Non-Adhering to ART		OR	95% CI	p-value
		Yes n=139(%)	No n=117(%)			
Age	15-19 years	116 (83)	81(69)	2.24	1.24-4.04	<0.05*
	10-14 years	23 (17)	36 (31)			
Marital Status	Married	32(23)	11(9)	2.88	1.38-6.02	<0.05*
	Not married	107(77)	106(91)			
Hours in mining activities per week	>50 Hours	27(31)	5(11)	3.54	1.26-9.96	<0.05*
	≤50 Hours	61(69)	40(89)			
Level of education	≤Primary	100(72)	101(86)	0.41	0.21-0.77	<0.05*
	>Primary	39(28)	16(14)			
Orphan status	Double Orphan	50(36)	26(22)	1.10	0.97-4.09	0.06
	Maternal orphan	17(12)	18(15)	0.98	0.42-2.3	0.96
	Paternal Orphan	46(33)	46(39)	1.11	0.56-2.19	0.76
	Not orphan	26(19)	27(23)			Referent
Household Average monthly income (RTGS$)	≤100	66(47)	35(30)	2.12	1.26-3.55	<0.05*
	>100	73(53)	82(70)			

Adolescents who were in the age group of 15-19 years were 2 time more likely to be non-adherent than those who were in the age group of 10-14 years, with OR=2.24 and CI=1,24-4.04. Adolescents who were married were 2 times more likely to be non-adherent to ART than those who were not married with OR=2.88 CI=1.38-6.02. In this study, those who were engaged in artisanal mining for >50 hours per week were 3 times more likely to be non-adherent to ART than those who were engaged in artisanal mining for ≤50 hours and this was statistically

significant with (OR=0.28 CI=0.10-0.79). Adolescents from households with an average monthly income of ≤ RTGS$100-00 were 2 times more likely not to adhere to ART than those from households with an average monthly income of >RTGS$100, with OR=2.12 CI=1.26-2.12. In this study there was no association between non-adherence to ART and orphan hood.

4.4 Individual factors associated with non-adherence to antiretroviral therapy among adolescents in Sanyati District, 2019

Presented on table 5 are individual factors associated with non-adherence to antiretroviral therapy among adolescents in Sanyati District.

Table 5: Individual factors associated with non-adherence to ART among Adolescents in Sanyati District, Mashonaland West Province, Zimbabwe, 2019

Variable	Category	Non-Adhering to ART		OR	95%CI	p-value
		Yes n=139	No n=117(%)			
Lack of Knowledge on ART	Yes No	126(91) 13(10)	9(8) 108(92)	116.31	47.86 – 282.64	<0.05*
Participate in Artisanal Mining	Yes No	88(63) 51(37)	45(38) 72(62)	2.76	1.66-4.59	<0.05*
Failure to disclose HIV status	Yes No	116(83) 23(17)	69(59) 48(41)	3.51	1.97-6.26	<0.05*
React to ART medicines	Yes No	3(2) 136(98)	1(1) 116(99)	2.56	0.26-24.94	0.40
Use of alternative treatment methods other than ART medicines	Yes No	31(22) 108(78)	5(4) 112(96)	6.43	2.41-17.15	<0.05*
Good perceived ART benefits	Yes No	60(43) 79(57)	97(83) 20(17)	0.16	0.9-0.28	<0.05*

Adolescents who were participating in artisanal mining were 2 times more likely not to adhere to ART than those were not participating in artisanal mining. Adolescents who were using alternative HIV treatment methods were 6 times more likely not to adhere to ART than those were relying on medical ART only. This was statistically significant. [Participating in artisanal mining – OR=2.76 CI=1.66-4.59; Use of alternative HIV treatment methods – OR=6.43 CI=2.41-17.15]. Of the respondents 14% (36/256) admitted that they were using alternative HIV treatment methods and 58% (21/36) of those who were using alternative treatment methods were using herbs. Forty two percent (15/36) admitted that they were using anointed water for alternative HIV treatment.

4.5 Socio-cultural factors associated with non-adherence to antiretroviral tharepy among adolescents in Sanyati District, 2019

Table 6 is showing the socio-cultural factors associated with non-adherence to ART among adolescents in Sanyati District in Mashonaland West province, Zimbabwe, 2019.

Table 6: Socio-cultural Factors associated with non-adherence to ART among Adolescents in Sanyati District, Mashonaland West Province, Zimbabwe, 2019

Factor	Category	Non-Adhering to ART		OR	95% CI	p-value
		Yes n=139(%)	No n=117(%)			
Religion allow taking of ART	Yes No	107 32	91 26	0.96	0.53-1.72	0.88
Family allow you to take ART	Yes No	113(81) 26(19)	89(76) 28(24)	1.37	0.75-2.50	0.31
Permission to visit health care centre(s) for ART refill	Yes No	96(69) 43(31)	95(81) 22(19)	0.52	0.29-0.9	0.03

Adolescents who were being given the permission by their parents or guardians to visit health care facilities alone for ART resupplies were 48% less likely to adhere to ART than those who were not allowed to visit health facilities alone in Sanyati District.

4.6 Stigma and Discrimination Assesment among Adolescents in Sanyati District, 2019

Displayed on table 7 is the stigma and discrimination index for HIV positive adolescents in Sanyati District.

Table 7: Stigma and Discrimination Index for HIV positive adolescents in Sanyati District, Mashonaland West Province, Zimbabwe, 2019

Form of Stigma	Score	Rating	Unit value	Index
Adolescents who are concerned about their HIV status disclosure.	70	Very high	20	14.0
Adolescents who think they experienced stigma in the last year up to date.	18	Low	20	3,6
Adolescents who blame HIV for their illness.	48	High	20	9.6
Adolescents who think HIV is a punishment from God.	22	Low	20	4.4
Adolescents who experienced stigma effects on themself, in family, religion, education, employment, Gender, community and in accessing health services.	76	Very high	20	14.8
Composite Stigma for adolescents in Sanyati		**High**	**100**	**46.4**

The overall composite stigma was high among HIV positive adolescents in Sanyati District with an overall score of 46.4. Internal stigma was very high among adolescents who were concerned about disclosing their HIV status with a score of 70 on the Stigma and Discrimination rating scale. Adolescents in the district also experienced very high external stigma from their families,

religion, education and their communities among others. External stigma from these sources was very high with a score of 76 on the Stigma and Discrimination rating scale.

4.7 Health services factors associated with non-adherence to ART among adolescents in Sanyati District, Mashonaland West province, 2019

Presented on table 7 are health services factors associated with non-adherence to ART among adolescents in Sanyati District.

Table 8: Health Service Factors associated with non-adherence to ART among Adolescents in Sanyati District, Mashonaland West Province, Zimbabwe, 2019

Factor	Category	Non-Adhering to ART		OR	95% CI	p-value
		Yes n=139(%)	No n=117(%)			
ART medicines always available at health facilities	Yes	112(81)	112(96)	0.19	0.07-0.50	<0.01*
	No	27(19)	5(4)			
Waiting hours at health facility	>30min	56(40)	43(37)	1.16	0.70-1.93	0.56
	≤30 min	83(60)	74(63)			
Distance to nearest health centre	≤10 km	35(25)	80(68)	0.16	0.09-0.27	<0.01*
	>10km	104(75)	37(32)			
Teaching on importance of ART by health workers	Yes	16(12)	47(40)	0.19	0.10-0.37	<0.05*
	No	123(88)	70(60)			

There was a statistically significant association between ART medicines being always available at health facilities in Sanyati District and non-adherence to ART, OR=0.19 CI 0.07-050). Those who were travelling a distance of ≤10km to the nearest health facility seeking for health care services were 84% less likely to adhere to ART than those who were travelling distances of >10km. Adolescents who pointed out that they were receiving teachings on importance of ART by health workers were 0.19 less likely not to adhere to ART than those who reported that they were not receiving teachings on importance of ART. [OR=0.19 CI=0.10-0.37].

4.8 Stratified Analysis

Displayed on table 8 is the association between non-adherence to ART and participating in artisanal mining stratified by sex, for adolescence in Sanyati District, Mashonaland West Province, 2019.

Table 9: Association between non-adherence to antiretroviral therapy and participating in artisanal mining stratified by sex, Sanyati District, Mashonaland West Province, Zimbabwe, 2019

Variable	Category	Artisanal Mining	Non-Adhering to ART		OR	95% CI	p-value
			Yes n=139	No n=117			
Sex	**Female**	Yes	39	20	2.08	1.10-4.33	0.05
		No	30	32			
	Male	Yes	49	25	3.70	1.83-7.63	<0.01
		No	21	40			
Crude OR			88	45	2.76	1.66-4.59	<0.01
			51	72			

The investigator analysed the relationship between non adherence to ART and participating in artisanal mining stratified by sex. The crude odds ratio of non-adhering to ART and participating in artisanal mining lies in between the stratum specific odds ratios. Therefore the association between non-adhering to ART and engaging in artisanal mining was modified by sex (male or female). Males who were participating in artisanal mining were 3.7 times [OR=3.7, 95% CI=1.83-7.63] likely not to adhere to ART compared to 2.08 times [OR=2.08 95% CI=1.10-4.33] among females who were also engaged in artisanal mining.

4.9 Independent Factors associated with Non-Adherence to Antiretroviral Therapy Among Adolescence in Sanyati District, Mashonaland West Province, Zimbabwe, 2019

Presented on table 9 are independent factors associated with non-adherence to ART among adolescents in Sanyati District.

Table 10 Independent factors associated with non-adherence to antiretroviral therapy among adolescents in Sanyati District, Mashonaland West Province, Zimbabwe, 2019

Variable	aOR	95% CI
Participating in artisanal mining	6.24	1.87-11.25
Perceived ART benefits	0.11	0.03-0.46
Failure to disclose HIV status	8.30	1.86-37.09
Availability of ART medicines	0.09	0.03-0.33
Household monthly income of ≤$100	21.36	1.42-32.8

Participating in artisanal mining, perceived ART benefits, failure to disclose HIV status, availability of ART medicines and having a household monthly income of ≤$100 were the independent factors associated with non-adherence to ART among adolescents in Sanyati District.

4.10 Commodities availability status, Sanyati District, Mashonaland West Province, 2019

We assessed availability status of commodities which were required in the management of HIV in Sanyati District. Displayed on table 10 is the antiretroviral drugs and commodities availability status in Sanyati District in 2019.

Table 11: Commodities Availability, Sanyati District, Mashonaland West Province, Zimbabwe, 2019

Item	History of stock outs	Current Stock	Minimum stock required	Comments
First line ART medicines				Were available
TDF+ 3TC+ Dolutegravia EFV	January 2019	9050		
Dolutegravia	January to June 2019	Nil	6053	Was not available in all facilities.
AZT + 3TC+ NVP		528	396	
Efavirenz	March 2019	516	468	
NVP		276	512	Always in excess
2nd line ART medicines				Not always available
ABC+3TC		147	2128	Only available in 5 facilities but not adequate for the District. Medicines were supplied as per request.
Alluvia		384	484	Only available in 5 facilities, but not adequate in the District. Medicines were supplied as per request.
Kaletra		41	1424	Only available in 5 facilities but not adequate in the District. Medicines were supplied as per request.
Availability of Resources				
CD4 Count Machines		3	3	Available at Rimuka Adult clinic, Sanyati and Kadoma General Hospitals
ART guidelines		69	43	At least 2 guidelines were available at each health facility.
Trained staff		32	148	Trained staff not adequate enough for the District
IEC materials on HIV management and treatment	Fliers	28	1500	Not adequate
	Pamphlets	Nil	1500	Were not available in all facilities
	Posters	62	186	Not adequate

First line ART medicines were always available in all the facilities in Sanyati District. The district experienced shortage of *Effavirenz* the whole month of March 2019. Sanyati District never experienced stock outs of second line ARV mediciness. The investigator noted that 69 ART guidelines were available and they were in excess of the required 43 ART guidelines for the whole district. Only 32 staff members were trained on updated HIV and AIDS management and 132 staff members were not trained. Information education and communication material was also inadequate.

4.11 Adolescents Knowledge on Human Immunodeficiency Virus and Antiretroviral Therapy Adherence, Sanyati District, Mashonaland West Province, 2019

Displayed on table 11 are the knowledge levels of respondents on some of the factors associated with non-adherence to ART as well as HIV and AIDS issues.

Table 12: Knowledge levels of Adolescence on factors associated with non-adherence to ART, HIV and AIDS, Sanyati District, Mashonaland West Province, Zimbabwe, 2019

Knowledge Indicator	Non-Adhering to ART		p-value
	Yes n=139(%)	No n=117(%)	
Definition of HIV	136(98)	116(99)	<0.01
Definition of AIDS	131(94)	115(98)	<0.01
Benefits of taking ART	101(73)	114(97)	<0.01
ART should be taken for the rest of one's life	106(76)	111(95)	<0.01
The effectiveness of medication is influenced by the time at which it is taken	93(67)	94(80)	<0.01
Taking medication incorrectly and missing doses determine	74(53)	89(76)	<0.01

The investigator used the Z-Score calculator on the Social Science online statistical calculators at 5% level of significance, to compare knowledge levels among adolescents who were non-adhering to ART and those who were adhering to ART. There were statistical differences on knowledge levels between those who were non-adhering to ART and those who were adhering to ART with p-values of <0.01 on all the six questions the respondents were assessed on. Those who were adhering to ART had good knowledge on HIV and ART adherence than those who were non-adhering to ART.

4.12 Key Informant findings on reasons contributing to antiretroviral therapy non-adherence among adolescents in Sanyati District, Mashonaland West province, 2019

We qualitatively analysed data from 31 Key informants using the *Wordle* word cloud online software. Displayed on figure 5 is a word cloud output showing some of the responses by the key informants.

Figure 5: Word cloud output for qualitative analysis of responses on reasons contributing to antiretroviral Non-Adherence rate, Sanyati District, Mashonaland West Province, Zimbabwe, 2019

The respondents cited formulation of whatsapp groups as a measure that can improve adherence to ART among adolescents in Sanyati District. *"Adolescents sometimes need information from their peers who might also be on ART so that they share different experiences of taking ART medicines, however lack of communication platforms among adolescents in Sanyati District is contributing to non adherence to ART among young adults"*. Apart from that key informants also suggested that the district health executive was suppose to appreciate the advent of technology and formulate communication platforms which can be used in disseminating health information among adolescents and also among adolescence and health care workers.

"Adolescents need to share information as well as getting support from health workers and fellow adolescents who might also be on ART, creation of whatsapp groups at each facility or at district level can help in promoting adherence to ART among adolescents as information on how best ART medicines should be taken and possible challenges that can be encountered when one is on ART can be shared on such communication platforms"

Respondents also suggested pill burden to be one of the major contributors to non-adherence to ART among adolescents in Sanyati District. "*The burden of taking ART medicines is also contributing to non adherence to ART among adolescents in Sanyati District. Adolescents in Sanyati District participate in artisanal mining and sometimes it becomes a burden for them to carry their ART medicines when going for artisanal mining"*

Key informants also highlighted that to reduce or minimise non adherence to ART among adolescents in Sayati District, there was need for reviving youth friendly corners. *"In Sanyati District, we used to have youth friendly corners, where youth including adolescents were getting health information on ART adherence. When Non Governmental Organisations (NGOs) which were sponsoring these youth friendly corners pulled out of the district, the youth friendly corners disapered from Sanyati District"*

Key informants also cited poverty as one of the reasons contributing to non adherence ton ART among adolescents in Sanyati District. *"Poverty is one of the major contributors to non adherence to ART among adolescents in Sanyati District, most families in the district are poor, they can not afford to have decent meals and they sometimes can not afford busfares to and from*

the clinics where they access ART medicines. This has greatly contributed to non adherence rates in Sanyati District.

The other reason which was also cited to be contributing to non adherence to ART among adolescents in Sanyati District was lack of ART refill groups. *"The district does not have ART refill groups for HIV positive individuals. Art refill groups are important in reducing the burden of travelling to and from the clinics for ART medicines resupplies among adolescents, hence ART refill groups promote treatment adherence".*

Key informants also recommended adopting the use of SMS adherence reminders and the funding of ART support groups in Sanyati District in order to improve ART adherence among adolescents within the district.

CHAPTER 5

Discussion and Limitations

5.1 Discussion

In this chapter the independent factors for non-adherence to ART in Sanyati District were identified and discussed as below:

The study demonstrated that non-adherence to ART was common in adolescents who were in the age group 15-19 years than adolescents who were in the age group of 10-14 years. The investigator noted that there was no association between orphan-hood and non adherence to ART. Though in this study there was no association between orphan-hood and non-adherence to ART, it is important to note that orphaned adolescents are more likely not to adhere to medication as they usually lack parental guidance on how to take their ART medicines. Contrary to our findings, Semvua *et.al* found a statistically significant association between non-adherence to ART and being an orphaned adolescent (20). Also contrary to this study, Wakesa *et.al*, highlighted that high non-adherence and defaulting rates were associated with orphaned adolescents than those who were not orphaned.

The study also noted a statistically significant association between being married and non-adherence to ART. Married adolescents in Sanyati District were more likely not to adhere to ART than those who were not married. Consistent with our findings Wang *et.al* in China, noted that adolescents who were married were not adhering to ART. In the same study married adolescence were sometimes not disclosing their HIV status to their partners, hence they were also not visiting health facilities for their ART resupplies (24).

Poor economic status can also affect adherence to medication. This study found that adolescents from families with a low average monthly income were more likely not to adhere to ART than those adolescents, from families with middle to higher average monthly incomes. In line with this study, in Malawi Kim *et.al* noted a statistically significant association between poverty and non-adherence to ART. Adolescents from families with low income status were not adhering to ART when compared with those from families with higher incomes (21). This study demonstrated that adolescents who lacked ART knowledge, who participated in artisanal mining, who were not disclosing their HIV status and those who were using alternative HIV treatment methods other than medical ART were more likely non-adherent to ART. Similar to this study findings, Semvua *et.al* in Northern Tanzania noted that HIV positive adolescents especially those who are out of school need to be engaged in income generating projects to improve their life styles as well as their medication adherence. The study noted that ART medicines should be taken after a good diet and if adolescents were capacitated to be able to buy their own food through these income generating projects, positive improvements in terms of ART adherence was going to be noted (20). Peltzer *et.al* highlighted that lack of parental control among adolescents in low to medium income countries was associated with non-adhere to ART. The study pointed out that parental control can persuade adolescents to contiunue taking their medication religiously as young adults are believed to follow instructions from their parents more than from health workers or friends (22). The study by Peltzer *et.al* was consistent with this study findings as adolescents who were double orphaned were more likely to be non-adherent to ART than those who were martenal or partenal orphaned, though the association was not statistically significant.

Most of the adolescents, who were not adhering to ART in Sanyati District, were lacking knowledge on importance of taking ART. Similar to these study findings, Shukla *et.al* reported high non-adherence rate among adolescents who lacked knowledge on how to take their ART medicines in northern India District (23). The study pointed out that some adolescents were taking medication incorrectly and some were taking medication with empty stomachs. For successful ART adherence, HIV positive adolescents must be taught and assisted to include taking of their ART medicines in their daily routines for the medicines to be effective in suppressing their viral loads (26).

In this study a statistically significant association between hours spent doing mining activities per week and non-adherence to ART among adolescents in Sanyati District was noted. Artisanal miners usually do artisanal mining far away from their homesteads and health facilities which supply them with ART medicines and usually they do not carry their ART medicines with them as well as missing their ART resupply days. Consistent to the findings of this study, Nachega *et.al* in a study on ART adherence and immunologic outcomes in Southern Africa, it was noted that adolescents were not concerned about therapy and some were not carrying extra antiretroviral doses when going out of their homes for a day or more and this practice was associated with non-adherence (16).

Coleman *et.al* noted that adolescents in South Africa who were staying in mining settings were not adhering to ART, when compared with adolescents who were not staying in mining environment (34). The investigator also noted similar findings in Sanyati District as Adolescents who were engaged in mining activities particularly artisanal mining were more likely not

adhering to ART than those who were not doing artisanal mining. This study also noted that use of alternative ART medicines by adolescents in Sanyati District was associated with non adherence to ART. This is biologically plausible as individuals who use multiple treatment methods, they usually use one type of medication per given time. Some adolescents in Sanyati District admitted that they were using herbs and anointed water in place of ART medicines, hence chances were high that they were using herbs or anointed water only and not medical ART. Some socio-cultural factors associated with non-adherence to ART are fear of stigmatisation from the community, need for consent from parent or guardian to take ART medicines and religion. Some religions do not allow use of any form of medicines.

The investigator also noted that adolescents in Sanyati District experienced high internal stigma and external stigma. Internal stigma was particularly from fear of disclosing HIV status among the adolescents. In this study, it was also noted that the majority of HIV positive adolescents in Sanyati District, experienced external stigma from their families, in gender circles and in religious activities. Both internal and external stigma can promote non-adherence to ART among adolescents as adolescents will usually not take their ART medicines properly as a result of fear of stigmatisation. In Costa Rica, Stout *et.al* noted that fear of stigmatisation by school mates and community members were the major factors contributing to non-adherence among adolescents in the country.

Adolescents who were travelling long distances to the nearest health facility to access ART medicines were more likely to be non-adherent to ART than those who were travelling short distances. In South Africa, Maskew *et.al* noted similar findings, as adolescents in South Africa

who were travelling long distances to health facilities where they were collecting their ART, were not adhering to ART. Adolescents who travel long distances to health facilities to access ART services usually face challenges like high transport costs and sometimes inaccessible roads. Sanyati District has poor road network especially in rural areas and most of the roads are inaccessible during rainy season. Long distances to nearest health centres coupled with poor road network and inaccessible roads can give adolescents challenges in accessing health facilities for their ART resupplies, hence this can promote non-adherence to ART.

Wang *et.al* cited long waiting hours at health facilities by adolescents as one of the factors contributing to non-adherence to ART (35). Contrary to Wang *et.al*, this study noted that the association between long waiting hours by adolescents at health facilities and non-adherence to ART were not statistically significant. In this study, adolescents who cited lack of confidentiality by health workers were more likely not to adhere to ART, though the association was not statistically significant. In line with this study, Gross *et.al* also pointed out that health workers' attitude towards adolescents has a bearing in their treatment adherence. The study pointed out that confidence and trust in providers was associated with adherence in HIV-infected adolescents in Zimbabwe (12).

It is of importance to note that ART medicines stock outs can result in poor adherence (38). In Sanyati District health facilities, first line medicines were always available. Second line medicines were only available in clinics with clients which have been switched from first line to second line ART medicines. This study noted that there was shortage of second line medicines in Sanyati District as those who were on second line drugs were being given two weeks supplies.

Considering the cash crisis being experienced in Zimbabwe, this could pose a serious challenge on meeting the pill pick up times among adolescents in the District. The situation has the potential to cause medicines interruption which is one of the reasons for the increased cases of new drug resistance HIV strains (39). If patients who are on ART become resistant to second line treatment, it will mean they will have to be commenced on third line treatment which is costly to manage. Patients on third line are managed by specialist physicians, hence there was no need to stock these medicines at facility level in Sanyati District as these specialists are mostly found at tertiary health institutions in Zimbabwe (6).

Generally the knowledge levels of adolescents in Sanyati District was not poor, however those who were adhering to ART had better knowledge than those who were not adhering to ART. Despite having good knowledge about HIV and ART adherence, adolescents may face circumstances which can derail optimal adherence. Adolescents may also present with specific adherence problems, such as denial about HIV persistence after continuous treatment from the childhood phase and the issues that HIV and AIDS poses to them during a phase of development in which social adaptation gains importance in their lives (38). Sometimes adolescents find it difficult to open up about these circumstances as they struggle internally to resolve them (41). It is important that health care workers should offer adherence counselling to such adolescents. Honrnschuh *et.al* in South Africa suggested use of sent messages platform or whatsapp platform to communicate ART adherence messages to adolescents (40). The strategies can also be implemented in Sanyati District among adolescents to improve adherence among adolescents in the District.

The investigator noted that the majority of responses from key informants were highlighting the issue of formulation of adolescents groups like CATS as these help adolescents to meet as groups and share their experiences. This study also noted that health workers appreciated the use of technology in advocating adolescents to adhere to their ART medication. Consistent to this study findings, the International AIDS Society Satellite Session (2016) also pointed out HIV positive adolescents would also benefit from reminders like SMS reminders and this will likely to trigger adolescents to stay in the health system and keep taking their medication (41). When adolescents meet as groups they usually realise that there are other people in the community who have the same health conditions as theirs as opposed to when someone stays at home thinking they are alone (42). This study also noted that the majority of respondents cited pulling out of the Africa Aid (AFRICAID) Zvandiri programme from Sanyati as one of the major draw backs in achieving a better adherence rate among adolescents in the District. The AFRICAID-Zvanidiri programme was targeting HIV positive adolescents in the district, equipping them with knowledge, skills and confidence to live with HIV. Since the programme pulled out of the district no HIV and AIDS programmes were running in the districts particularly for adolescents in the District.

Due to the burden of taking a life-long treatment, adolescents described facing HIV-related stigma in their families, within their communities and during accessing health care services. The majority of adolescents in Sanyati District pointed out that they faced HIV-related stigma in trying to get employment. Some adolescents pointed out judgmental attitudes of health providers as also promoting non-adherence to ART among their peers. The findings from this study demonstrated that HIV-positive adolescents need better information, trust in health care workers

and more support. In line with this study Barclay *et.al* also noted that for adolescents to take comfort in talking with a health care worker or provider it should be stimulated by trust (43). This study also noted that friends, family members and health facilities are preferred for discussing ART and HIV issues. Adolescents also highlighted that most information comes from health facilities and support groups, followed by the internet and family. The investigator noted that adolescents need practical strategies to improve adherence and to feel supported, such as face to face support through counselling, treatment buddies, and sessions involving parents or guardians and role models.

5.2 Limitations

In this study the investigator could not do baseline viral load tests due to resource limitations. Viral load testing can be useful in assessing treatment adherence as it indicates whether the medication is taken properly or not.

CHAPTER 6

Conclusion and Recommendations

6.1 Conclusion

In this study, adolescents who were married and were from households with an average monthly income of ≤100 RTGS$ were more likely to be non-adherent to ART. Adolescents who were in the age group of 10-14years, who were engaging in artisanal mining for ≤50 hours and those who were doing or had acquired primary education only were more likely to be adherent to ART. Adolescents in Sanyati District lacked knowledge on importance of taking ART medicines correctly. Being an artisanal miner, use of alternative HIV treatment methods and failure to disclose taking of ART medicines to friends or family members were some of the statistically significant individual factors associated with non-adherence to ART among adolescents in Sanyati District**.**

Adolescents who experienced stigma in accessing healthcare services and those who were not allowed by their guardians or parents to visit health care facilities were more likely to be non-adhering to ART than those who did not experience the same. In this study, teaching of adolescents by health care workers on the importance of ART, travelling distances of ≤10km to the nearest health facilities and availability of ART medicines were some of the statistically significant factors associated with non-adherence to ART, and the factors were protective against non-adherence to ART. First line ART medicines and ART guidelines were adequately available in Sanyati District, however second line ART medicines and IEC material were inadequate for

the District. Adolescence who were non adhering to ART had better knowledge on ART adherence, HIV and AIDS issues. In this study, lack of platforms where adolescents can meet and share experiences on how they were taking ART was cited by key informants as the major contributor to high proportions of non-adherence among adolescents in Sanyati District. Adolescents in Sanyati suffered stigma mainly in the employment sector in their communities and in accessing health care services.

6.2 Recommendations

This study recommended:

- Health workers in Sanyati District should educate adolescents on the importance of disclosure of both HIV status and taking of ART medicines to friends and family members. – **District Medical Officer.**
- Use of alternative HIV treatment methods other than medical ART should be discouraged. – **District Health Promotion Officer**
- Sanyati District should come up with Adolescents community ART refill groups (ACARG) . The groups will assist adolescents who were travelling long distances to access ART as they will be accessing ART closer to their homes. – **District Nursing Officer and District Pharmacist**
- Sanyati District should produce and procure IEC material on HIV management and ART specifically for adolescents. **– Health Promotion Officer.**
- Sent messages (SMS) adherence reminders can be used to remind adolescents to take their ART daily in Sanyati District. – **District Medical Officer.**

- There is need to revive the CATS programme in Sanyati District. – **District Medical Officer**

To address stigma, Sanyati District Health Executive was advised to:

- Promote and engage political and other public personalities to champion anti HIV stigma campaigns in Sanyati District.
- Intergrate HIV, confidentiality and ethical issues training especially on issues affecting key population and adolescents living with HIV.
- Promote anti HIV stigma campaigns in schools, mining areas and any other learning institutions.
- Spearhead the evaluation of existing education curricula and eliminate content that perprtuate HIV related stigma and discrimination

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APPENDIX 1

ADULT CONSENT FORM FOR STUDY PARTICIPANTS (18 years and above)

STUDY TITLE: Determinant of Non-adherence to Anti Retroviral Therapy among adolecents in Sanyati District, 2019.

NAME OF RESEARCHER: Mhembe Chamunorwa

PHONE NUMBERS: 0712721177 or 0773746837

PROJECT DESCRIPTION

I am a Master in Public Health (MPH) student at the University of Zimbabwe, College of Health Sciences. I am attached at Kadoma City Health department. I am conducting a research on Determinant of Non-adherence to Anti Retroviral Therapy among adolecents in Sanyati District, 2019. You are part of the 231 adolescents chosen to be part of the study because you are on Antiretroviral Therapy.

YOUR RIGHTS

Before you decide whether or not to participate in this study, you must understand its purpose, how it may help you, the risks to you, and what is expected of you. This process is called informed consent.

PURPOSE OF RESEARCH STUDY

You are being asked to participate in a research study to determine factors associated with Non-Adherence to Antiretroviral Therapy among HIV Positive Adolescents in Sanyati District, Mashonaland West Province, 2019.There are high chances that this study will provide immediate evidence-based decisions to inform HIV programming in Sanyati District and other similar settings.

PROCEDURES INVOLVED IN THE STUDY

Data will be collected through interviewer administered questionnaires and checklists. Information on socio-demographic factors, individual factors, health services related factors and socio-cultural factors associated with non-adherence to ART in Sanyati District will be collected. Your treatment cards will be reviewed as well as antiretroviral registers at Sanyati District hospital. The study will not influence your medical follow up. If you decide not to take part in the study, your medical follow will continue as normal and you will not lose any benefits. You will be given a healthy drink (Mahewu) and a muffin after the interview.

DISCOMFORTS AND RISKS

Given the nature of the study, minimal risks are foreseeable during the questionnaire phase. If you feel that the investigator is not revealing the whole truth about the purpose of the study or questionnaire you can contact the supervisor for confirmation. If you feel uncomfortable due to the nature of the questions, feel free to tell the investigator.

POTENTIAL BENEFITS

I cannot and do not guarantee or promise that you will receive any benefits from this study. This study is designed for researchers to learn more about factors associated with non-adherence to ART among adolescents.

STUDY WITHDRAWAL

You may choose not to enter the study or withdraw from the study at any time without loss of benefits entitled to you.

CONFIDENTIALITY OF RECORDS

Any information that is obtained in connection with this study that can be identified with you will remain confidential and will be disclosed only with your permission. You will not be required to put your name on the questionnaire. The information you are going to share is going to be used for educational purposes only. Your names will not be published. Confidentiality will be maintained. Completed questionnaires will be kept under lock and key at all times. Only the researcher will have access to the data.

PROBLEMS/ QUESTIONS

Please ask questions about this research or consent now. If you have any question in future you are free to contact my supervisor. (Dr Shambira on-0772 227 695)

AUTHORIZATION

I have read this paper about the study or it was read to me. I understand the possible risks and benefits of this study. I know being in this study is voluntary. I choose to be in this study: I

know I can stop being in the study and I will not lose any benefits entitled to me. I will get a copy of this consent form. (Initials on all the pages of the consent form)

……. …….

Client Signature Date & time

..……

Client Name (Printed)

……. … …….

Researcher's Signature Date & time

…….. …….

Witness' Signature Date

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APPENDIX 2

ASSENT FOR CHILDREN BELOW 18 YEARS (ENGLISH)

STUDY TITLE: Determinants of Non-Adherence to Antiretroviral Therapy Among Adolescents in Sanyati District, 2019

NAME OF RESEARCHER: Chamunorwa Mhembe

PHONE: 0712721177 or 0773 746 837

WHAT THE STUDY IS ABOUT

I am a Master in Public Health (MPH) student at the University of Zimbabwe, College of Health Sciences. I am attached at Kadoma City Health department. I am conducting a research on Determinants of Non-Adherence to Antiretroviral Treatment Among HIV Positive Adolescents in the Mining District of Sanyati, Mashonaland West Province, Zimbabwe, 2019. You are part of the 231 adolescents chosen to be part of the study because you are on Antiretroviral Therapy.

THE VOLUNTARY NATURE OF THE STUDY

You agree to participate in this study out of your own will. We will not force you.

THE PROCEDURES THAT WILL BE DONE

I will ask you questions which you will answer as honest as you can. I will review your treatment records. The study will not change anything related to your treatment. You will receive your care as usual. You will be given a healthy drink (Mahewu) and a muffin after the interview.

POTENTIAL BENEFITS & POTENTIAL RISKS

There will be no harm or direct benefits for participating in this study. The information obtained will help in coming up with solutions to improve the wellbeing of adolescents on HIV medication. If you feel that the investigator is not revealing the whole truth about the purpose of the study or questionnaire you can contact the supervisor for confirmation.

PROBLEMS/ QUESTIONS

Please ask questions about this research or consent now. If you have any question in future you are free to contact my supervisor. (Dr Shambira on-0772 227 695)

ASSURANCE THAT HE/SHE MAY WITHDRAW FROM THE STUDY AFTER DISCUSSING IT WITH HIS/HER PARENTS

I have already talked to your parents and they have agreed for you to participate in this study. However, if you feel not to participate in this study, you can withdraw at any given point.

TO READ AND SIGN BELOW

My participation in this study is voluntary. I have read and understood the above information, asked any questions which I had and have agreed to participate. I will be given a copy of this form to keep.

.....

Name of Subject

……

Signature of Subject

……

Date

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APPENDIX 3

PARENTAL CONSENT (ENGLISH)

STUDY TITLE: Determinant of Non-adherence to Anti Retroviral Therapy among adolecents in Sanyati District, 2019.

NAME OF RESEARCHER: Mhembe Chamunorwa

PHONE NUMBERS: 0712721177 or 0773746837

PROJECT DESCRIPTION

I am a Master in Public Health (MPH) student at the University of Zimbabwe, College of Health Sciences. I am attached at Kadoma City Health department. I am conducting a research on Determinant of Non-adherence to Anti Retroviral Therapy among adolecents in Sanyati District, 2019. Your child is one of the 231 adolescents chosen to be part of the study. This is because he/she is on HIV medication.

YOUR RIGHTS

Before you decide whether or not your child to participate in this study, you must understand its purpose, how it may help your child, the risks to your child, and what is expected of him or her.

PURPOSE OF RESEARCH STUDY

The purpose of the study is to obtain solutions to improve the wellbeing of children on HIV medication in Sanyati District.

PROCEDURES INVOLVED IN THE STUDY

I will ask questions which your child will answer as honest as he/she can. I will review your child's treatment records. The study will not change anything related to his/her treatment. Your child will receive his/her care as usual.

DISCOMFORTS AND RISKS

There will be no harm for participating in this study. If you feel that the researcher is not revealing the whole truth about the purpose of the study or questionnaire you can contact the supervisor for confirmation. If you feel uncomfortable due to the nature of the questions, feel free to tell the researcher.

POTENTIAL BENEFITS

There will be no direct benefits to your child. The information obtained will help improve the wellbeing of children on HIV medication in Sanyati District.

STUDY WITHDRAWAL

You may choose whether your child should or not enter the study. Your child can withdraw from the study at any time without any change in his/her care.

CONFIDENTIALITY OF RECORDS

Any information that is obtained in connection with this study that can be identified with your child will remain confidential. Your child will not be required to put his/her name on the questionnaire. Completed questionnaires will be kept under safe and lock at all times. Only the researcher will have access to the data.

PROBLEMS/ QUESTIONS

Please ask questions about this research or consent now. If you have any question in future you are free to contact my supervisor. (Dr Shambira on-0772 227 695)

AUTHORIZATION

You are making a decision whether or not to allow your child to participate in this study. Your signature indicates that you have read and understood the information provided above, have had all your questions answered and have decided to allow your child to participate. The date you sign this document to enroll your child in this study, that is, today's date, MUST fall between the dates indicated on the approval stamp affixed to each page. These dates indicate that this form is valid when you enroll your child in the study but do not reflect how long your child may participate in the study. Each page of this Informed Consent Form is stamped to indicate the form's validity as approved by the ethical board.

Name of Child (please print) …….. Date & time ……

Name of Parent (please print) ……. Date & time ……...

Signature of Parent or legally authorized representative ……. Date & time …….

Relationship to the child ……

Signature of Witness (if required) ……. Date & time ……..

Signature of Research Staff …… Date & time …….

YOU WILL BE GIVEN A COPY OF THIS CONSENT FORM TO KEEP

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APPENDIX 4

FOMU RECHIBVUMIRANO (SHONA)

MUSORO WETSVAGURUDZO: Determinant of Non-adherence to Anti Retroviral Therapy among adolecents in Sanyati District, 2019.

MUTSVAKIRIDZI: Mhembe Chamunorwa

NAMBA DZERUNHARE: 0712721177 or 0773746837

TSANANGURO YEPUROJEKITI

Ndiri mudzidzi weMasters muhutano hweruzhinji pa University ye Zimbabwe pakoreji yezveutano. Pari zvino ndiri kudzidza ndichishanda mukanzuru ye muguta re Kadoma, kubazi rezvehutano. Ndiri kuita tsvakurudzo yekuda kuziva zvinhu zvangabatanidzirwa nekusatora mapiritsi anoderedza utachiwana hwechirwere che Shuramatongo muno munharaunda ye Sanyati zvakanaka.

KODZERO DZAKO

Usati wafunga kuva norupandi mutsvakiridzo ino, unofanira kunzwisisa chinangwa, chekuti zvichakubatsira sei, njodzi kwauri uye zvawakatarisirwa kuita. Iyi inonzi mvumo inopiwa nevavhunzwi mutsvakiridzo mushure mokunge vawana ruzivo rwakakwana nezvetsvagurudzo kubva kumutsvakurudzi. Kuva norupandi mutsvagurudzo iyi isarudzo yako.

CHINANGWA CHETSVAKIRIDZO

Tsvagurudzo ino ndiyekuda kuziva zvinhu zvingabatanidzirwa nekusatora mapiritsi anoderedza utachiwana hwechirwere che Shuramatongo muno munharaunda ye Sanyati zvakanaka. Pane mukana wekuti tsvagiridzo ino ichapa umbowo uchabatsira mukuronga hurongwa hwekurapa chirwere cheshuramatongo muno munharaunda ye Sanyati nedzimwe nzimbowo dzingava nedambudziko rakafanana nerekuno kuSanyati.

ZVICHAITWA

Matorero atichaita humbowo hwenyu Tichashandisa bepa rine mibvunzo yekupindura. Tichaongorora magwaro ehurwere hwenyu. Ongororo iyi haineyi nemarapirwe amunoitwa. Kana mafunga kutora rupandi mutsvagurudzo iyi, kurapwa kwenyu hakuzosiyane nekwemazuva ose. Muchapiwa uchapiwa maheu ekumwa nebhanzi rekudya wapeda kupindura mibvunzo iyi.

NJODZI KANA KUSHUNGURUDZIKA

Tsvakurudzo iyi inotarisirwa kuva nemikana mishoma ye njodzi dzamungasangana nadzo pakupindura mibvunzo. Kana mukatadza makasununguka kubata kana kuona mukuru we bazi rezve hutano muno mudunhu re Sanyati kana muchinge musingagutsikane nechokwadi che chinangwa che tsvakurudzo iyi. Kana musina kusunguka kupindura mimwe mibvunzo yamuchabvunzwa, munogona kutsanangurirwa.

ZVINGAKUYAMURAIWO PAKUPINDA MUTSVAKIRIDZO IYI

Hakuna muripo uchapiwa kune vachava norupandi mutsvakurudzo. Zvichawanikwa mutsvakurudzo zvichashandiswa kutsvaga nzira dzingabatsira vechidiki kuti vatore mishonga inoderedza hutachiwana hwe HIV muropa zvakanaka.

KUBUDA MUTSVAKURUDZO

Munogona kusarudza kusapinda kana kubuda mutsvakurudzo chero nguva ipi zvayo.

KUCHENGETEDZWA KWE HUMBOWO HWENYU

Tichachengetedza zvakanyanya humbowo hwenyu kuti pasawana umwe munhu anogona kuwona humbowo hwenyu zvingaita kuti magariro enyu mudunhu ange ane kushungurudzika. Hapana mumwe munhu anobvumirwa kuona nyaya yenyu kunze kwekunge imi matipa mvumo yacho. tinokuzivisai kuti humbowo hwenyu tichahushandisa kune zvekudzidza chete. Zita renyu haridiwi pabepa rine mubvunzo yamuchapindura.

NJODZI NEZVINGAWANIKWA MUTSVAKURUDZO

Tsvakurudzo iyi inotarisirwa kuva nemikana mishoma ye njodzi dzamungasangana nadzo pakupindura mibvunzo. Zvatichawana mutsvakuridzo iyi zvichabatsira pahutano hwevana vari pamishonga kuti vamwe mishonga yavo zvakanaka. Kana mukaona sekunge hamuna kupihwa chokwadi chakakwana pamusoro pe tsvakurudzo iyi, makasunguka kuchaya runhare rwe mukuru wangu pa+263-0772 227 695

MATAMBUDZIKO/MIBVUNZO

Sunungukai kuvhunza mivhunzo nezvetsvakurudzo ino .Kana mukaita mivbunzo munguva dzinotevera sununguka kuvhunza mukuru wangu Dr Shambira muchishandisa runhare rwunoti- +263-0772 227 695

KUPIWA TENDERO

Ndaverenga/Ndaverengerwa bepa iri nezvetsvakurudzo. Ndinonzwisisa njodzi dzingawanikwa nezvakanakira tsvakurudzo iyi. Ndoziva kuti kuva mutsvakurudzo iyi isarudzo yangu. Ndinosarudza kupinda mutsvakurudzo ino: Ndinoziva kuti ndinogona kubuda mutsvakurudzo pasina kurasikirwa nomugove wakandifanira. Ndichatora rimwe peji refomu rino.

…….. ……..……..

Runyoro rwenyu Zuva neNguva

……

Zita renyu

…….. …….

Runyoro rwemutsvakiridzi Zuva neNguva

…… …….

Runyoro rwechapupu Zuva neNguva

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APPENDIX 5

CHIBVUMIRANO NEVANA VANEMAKORE ARI PASI PEGUMI NEMASERE

MUSORO WETSVAGURUDZO: Determinant of Non-adherence to Anti Retroviral Therapy among adolecents in Sanyati District, 2019.

MUTSVAKIRIDZI: Mhembe Chamunorwa

NAMBA DZERUNHARE: 0712721177 or 0773746837

TSANANGURO YEPUROJEKITI

Ndiri mudzidzi weMasters muhutano hweruzhinji pa UZ pakoreji yezveutano. Pari zvino ndiri kudzidza ndichishanda mukanzuru ye muguta re Kadoma, kubazi rezvehutano. Ndiri kuita tsvakurudzo yekuda kuziva zvinhu zvangabatanidzirwa nekusatora mapiritsi anoderedza utachiwana hwechirwere che Shuramatongo muno munharaunda ye Sanyati zvakanaka. Uri mumwe wevazhinji (231) vakasarudzwa kupinda mutsvagurudzo iyi nekuti uri pamushonga wechirwere cheshuramatongoo.

Kuzvipira kupinda musarudzo

Isarudzo yako kupinda mutsvakurudzo iyi. Haumanikidzwe.

ZVICHAITWA

Ndichakubvunza mibvunzo yauchapindura sekuziva kwako. Tichaongorora magwaro emarapirwo ako. Ongororo iyi haishanduri mabatirwo aunoitwa pachipatara. Muchapiwa uchapiwa maheu ekumwa nebhanzi rekudya wapeda kupindura mibvunzo iyi.

NJODZI KANA KUSHUNGURUDZIKA

Tsvakurudzo iyi inotarisirwa kuva nemikana mishoma ye njodzi dzamungasangana nadzo pakupindura mibvunzo. Kana ukatadza, wakasununguka kubata kana kuona mukuru we bazi rezve hutano munharaunda ino ye Sanyati kana uchinge usingagutsikane nechokwadi che

chinangwa che tsvakurudzo iyi. Kana usina kusunguka kupindura mimwe mibvunzo yamuchabvunzwa, munogona kutsanangurirwa.

MATAMBUDZIKO/MIBVUNZO

Sunungukai kuvhunza mivhunzo nezvetsvakurudzo ino .Kana ukaita mivbunzo munguva dzinotevera sununguka kuvhunza mukuru wangu Dr Shambira uchishandisa runhare rwunoti- +263-0772 227 695

KUBUDA MUTSVAKURUDZO

Tabvumirana nevabereki vako kuti upinde musarudzo iyi. Zvisinei hazvo, wakasunguka kubuda musarudzo iyi kana usina kusunguka.

VERENGAI MUGOSAINA PASI

Kupinda kwangu mutsvakurudzo ino ndekwekuzvipira. Ndaverenga ndikanzwisisa zvakanyorwa pamusoro, ndabvunza mibvunzo yese yandanga ndiinayo uyezve ndabvuma kupinda muresearch. Ndichapiwa kopi yefomu rino kuti ndigorichengeta.

……

Zita remwana

……

Runyoro rwemwana

…….

Zuva (Date)

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APPENDIX 6

FOMU RECHIBVUMIRANO CHEVABEREKI (SHONA)

MUSORO WETSVAGURUDZO: Determinant of Non-adherence to Anti Retroviral Therapy among adolecents in Sanyati District, 2019.

MUTSVAKIRIDZI: Mhembe Chamunorwa

NAMBA DZERUNHARE: 0712721177 or 0773746837

TSANANGURO YEPUROJEKITI

Ndiri mudzidzi weMasters muhutano hweruzhinji pa UZ pakoreji yezveutano. Pari zvino ndiri kudzidza ndichishanda mukanzuru ye muguta re Kadoma, kubazi rezvehutano. Ndiri kuita tsvakurudzo yekuda kuziva zvinhu zvangabatanidzirwa nekusatora mapiritsi anoderedza utachiwana hwechirwere che Shuramatongo muno munharaunda ye Sanyati zvakanaka. Mwana wenyu asarudzwa kuva mumwe wevazhinji (231) vakasarudzwa kupinda mutsvagurudzo iyi nekuti ari pamushonga wechirwere cheshuramatongo.

KODZERO DZENYU

Musati mafunga kuva norupandi mutsvakiridzo ino, munofanira kunzwisisa chinangwa, chekuti zvichabatsira sei mwana wenyu, njodzi kwaari uye zvaakatarisirwa kuita. Kuva norupandi mutsvagurudzo iyi isarudzo yako.

CHINANGWA CHETSVAKIRIDZO

Tsvakiridzo iyi ichatora humbowo pamusoro pehupenyu hwevechidiki uye zvikonzero zvingaita kuti vatadze kutora zvakanaka mapiritsi ayo ayo anoita kuti hutachiwana hwe HIV huderera

muropa revechidiki. Tsvakiridzo iyi ichaburitsa zvikonzero zvine humbowo zvichatibatsira mukudzivira kuwanda kwehutachiwana hwe HIV muropa revechidiki nekupa dzidziso yakakwana.

ZVICHAITWA

Ndichabvunza mibvunzo ichapindurwa ne mwana wenyu sekuziva kwake. Tichaongorora magwaro emarapirwo ake. Ongororo iyi haishanduri mabatirwo aachaitwa pachipatara.

NJODZI KANA KUSHUNGURUDZIKA

Tsvakurudzo iyi inotarisirwa kuva nemikana mishoma ye njodzi dzangasangana nemwana wenyu pakupindura mibvunzo. Kana mukada makasununguka kubata kana kuona mukuru we bazi rezve hutano muno munharaunda ye Sanyati kana muchinge musingagutsikane nechokwadi che chinangwa che tsvakurudzo iyi. Kana musina kusununguka kupindura mimwe mibvunzo yamuchabvunzwa, munogona kutsanangurirwa.

ZVINGAYAMURAWO MWANA WENYU PAKUPINDA MUTSVAKIRIDZO IYI

Hakuna muripo uchapiwa kune vachava norupandi mutsvakurudzo. Zvichawanikwa mutsvakurudzo zvichashandiswa kutsvaga nzira dzingaita kuti vechidiki vamwe mishonga yavo inoderedza hutachiwana hwe HIV muropa zvakanaka.

KUBUDA MUTSVAKURUDZO

Mwana wenyu anogona kusarudza kusapinda kana kubuda mutsvakurudzo chero nguva ipi zvayo.

KUCHENGETEDZWA KWE HUMBOWO HWENYU

Tichachengetedza zvakanyanya humbowo hwenyu kuti pasawana umwe munhu anogona kuwona humbowo hwemwana wenyu zvingaita kuti magariro enyu mudunhu ange ane kushungurudzika. Tinokuzivisai kuti humbowo hwemwana wenyu tichahushandisa kune zvekudzidza chete. Zita remwana wenyu haridiwi pabepa rine mubvunzo yaachapindura.

MATAMBUDZIKO/MIBVUNZO

Sunungukai kuvhunza mivhunzo nezvetsvakurudzo ino .Kana mukaita mivbunzo munguva dzinotevera sununguka kuvhunza mukuru wangu Dr Shambira muchishandisa runhare rwunoti--+263-7772 227 695

MUCHAPIHWA KOPI YEPEPA RAMASAINA KUTI MUGOCHENGETA

Kana muine mibvunzo pamusoro petsvakurutso ino kana fomu ramasaina iri kunze kweyamapindurwa kare nemunyori, kusanganisira zvetsvagiridzo, kodzero dzenyu pakupinda mutsvakurutso kana nezvekukuvara kunokonzerwa nekupinda mutsvakurutso uyezve kana muchiwona kuti hamuna kubatwa zvakugutsai muchida kukurukura nemumwe munhu asiri

muchikwata chevari kuita tsvakurutso ino sunungukai kufonera veMedical Research Council of Zimbabwe panhamba dzinoti 791792 or 791193

Zita Remwana …… Zuva neNguva ……..

…… …….

Zita remubereki kana mumiriri wemubereki (NYORAI ZVINOWONEKA) Zuva ne Nguva

…… …….

Siginecha yemubereki kana mumirririri wemubereki Zuva neNguva

…….

Ukama nemwana

…… ……

Kusaina Kwe Witinesi Zuva neNguva

…… ……..

Kusaina Kwemunyori Zuva neNguva

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APPENDIX 7

QUESTIONNAIRE FOR STUDY PARTICIPANTS (ENGLISH VERSION)

My name is Chamunorwa Mhembe. I am a Public Health Officer attached at Kadoma City council Health Department. I am conducting a study to determine factors associated with non-adherence to ART among adolescents in Sanyati District. I would like to ask you questions pertaining to this study.

Serial No/ ID			
Question Number	Question	Response	*Instruction*
SECTION A: DEMOGRAPHY CHARECTERISTICS			
1	Age *(in years)*		
2	Duration on ART *(in years)*		
3	Sex	Male [ ] Female [ ]	
4	Marital Status	Single [ ] Married [ ] Divorced [ ] Widowed [ ]	
5	Religion	Muslim [ ] Apostolic [ ] Pentecostal [ ] Traditional mainline churches [ ] None [ ]	
6	Employment status	Formal [ ] Artisanal Miner [ ] Unemployed Other type of employment specify.....	
7	Hours in mining activities per Week	≤50 Hrs [ ] >50 Hrs [ ]	
8	Level of Education	Primary [ ] Secondary [ ]Tertiary [ ] None [ ]	

9	Orphan status	Double Orphan [ ] Maternal Orphan [ ] Paternal Orphan [ ] Not Orphan [ ]	
10	Household Average Monthly income in RTGS$	≤ 100 [ ] >100 [ ]	
SECTION B: INDIVIDUAL FACTORS			
11	What is HIV? *(Likert question)*	.....	
12	What is AIDS? *(Likert question)*	.....	
13	How is HIV transmitted? *(Likert question)*	Unprotected Sexual intercourse [ ] Sharing clothes [ ] Sharing utensils [ ] Body Fluids [ ] Other.....	*Tick all the appropriate answers*
14	Do you see any benefits of taking antiretroviral pills?	Yes [ ] No [ ]	
15	Give reasons to your answer on question 13?	....	
16	Have you ever reacted to ART medicines?	Yes [ ] No [ ]	*If NO to question 16, skip to 18*
17	If **YES** to question 15, list the regimen drugs involved	1st Line [ ] 2nd Line [ ] 3rd Line [ ]	
18	Are you aware that ART should be taken for the rest of your life?	Yes [ ] No [ ]	
19	Do you know that the time at which medication is taken influences its effectiveness?	Yes [ ] No [ ]	
20	Are you aware that missing	Yes [ ] No [ ]	

	doses/ or taking them late or incorrectly will determine treatment effectiveness?		
21	Do you Disclose that you are taking antiretroviral pills to friend(s) or family member(s)?	Yes [ ] No [ ]	
22	If NO to question 15, give reasons why not disclosing?	....	
23	If YES to question 15, to whom have you disclosed?	Parent/Guardian [ ] Friend [ ] Spouse [ ]	
24	Do you use any alternative HIV treatment methods other than medical ART?	Yes [ ] No [ ]	
25	If **YES** to question 18 which treatment methods do you use?		*List the treatment methods.*
SECTION C: SOCIO-CULTURAL FACTORS			
26	Does your culture allow you to take antiretroviral pill?	Yes [ ] No [ ]	
27	Are you given the permission to visit health facilities to access treatment?	Yes [ ] No [ ]	
SECTION D: HEALTH SERVICES RELATED FACTORS			
30	How far are you	<10 Km [ ] >10 KM [ ]	

	from the nearest health centre?		
31	Are there any HIV prevention and control programmes that you are involved in at your nearest health facility?	Yes [ ] No [ ]	*If No to question 25 go to question 27*
32	If Yes to question 25, which programmes do you participate in?	....	*List the programmes(s) on space provided*
33	Are ART medicines always available at your nearest health centre?	Yes [ ] No [ ]	*If YES skip to question 29*
34	If NO to question 27 what do you do to get your medicines?	next nearest clinic [ ] District Hospital [ ] I will wait until tablets are available at my nearest clinic [ ]	
35	How long do you take waiting for your ART medicines at the clinic?	<30 minutes [ ] 30-60 minutes [ ]> more than 60 minutes	
36	Do you pay clinic consultation fees when you want to get your ART medicines?	Yes [ ] No [ ] Sometimes [ ]	
37	Did health workers teach your on importance of taking your ART medicines religiously	Yes [ ] No [ ]	
SECTION E: ADHERENCE *(Morisky 8-Item ART Adherence Questionnaire)* (***Answer Yes/No Yes=1 and No=0)***			
38	Do you sometimes forget to take your ART pills?	Yes [ ] No [ ]	

39	People sometimes miss taking their ART pills for reasons other than forgetting. Thinking over the past 2 weeks, were there any days when you did not take your ART pills?	Yes [ ] No [ ]	
40	Have you ever cut back or stopped taking your pills without telling the nurse(s) or doctor(s) at the health facility because you felt worse when you took them?	Yes [ ] No [ ]	
41	When you travel or leave home, do you sometimes forget to bring along your pills?	Yes [ ] No [ ]	
42	Did you take all your pill doses yesterday?	Yes [ ] No [ ]	
43	When you feel like your symptoms are under control, do you sometimes stop taking your pills?	Yes [ ] No [ ]	
44	Taking pills everyday is a real inconvenience for some people. Do you ever feel hassled about sticking to your treatment plan?	Yes [ ] No [ ]	

45	How often do you have difficulty remembering to take all your pills? - A. Never/rarely -B. Once in a while -C. Sometimes -D. Usually -E. All the time		*A =0* *B – E =1*
TOTAL SCORE Scores >2 = High non-adherence to ART 1 OR 2 = medium non-adherence to ART 0 = Adherence to ART			

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APPENDIX 8

MIBVUNZO YEVANHU VARIMUTSVAKURUDZO INO (SHONA VERSION)

Makadii zvenyu? Zita rangu ndinonzi Chamunorwa Mhembe. Ndiri muongorori hweutano ndichishandira kuKanzuru yeKadoma City. Ndiri kuitawo tsvakiridzo yekuda kuziva zvinhu zvangabatanidzirwa nekusatora mapiritsi anoderedza utachiwana hwechirwere che Shuramatongo muno munharaunda ye Sanyati.Ndinokumbirawo kukubvunzai mibvunzo mayererano nezve tsvakiridzo iyi.

NO YEBEPA REMIBVUNZO			
Nhamba ye mubvunzo	Mubvunzo	Mhinduro	*Murayiridzo*
CHIKAMU CHEKUTANGA: ZVIRI PAMUSORO PEMUNHU APINDA MUTSVAKURUDZO INO			
1	Makore okuberekwa		
2	Makore mangani uchimwa mapiritsi		
3	Uri Munhui?	Murume [ ] Mukadzi [ ]	
4	Uri muwanano here?	ndirindoga [ ] Ndirimuwanano [ ] Takarambana [ ] Ndakashaikirwa nemumwe wangu [ ]	
5	Chitendero Chaunopinda ndechipi?	Mozilemu [ ] Postori [ ] Dzemweya [ ] Dzakare Dzema mishinari [ ] None [ ]	
6	Unoshanda basa rei?	Ndinoshanda PaKambani [ ] Handishandi [ ] Ndinokorokoza mumigodhi yeghoridhe [ ] Zvimwe	
7	Nguva yaunoshanda mumughodhi	≤50 Hours [ ] >50 Hours [ ]	

	yeGhoridhe pasvondo yakawanda sei?		
8	Wakadzidza kusvika papi?	≤Puraimari [ ] >Puraimari	
9	Unherera	Nherera isina baba namai [ ] Nherera uisina mai chete [ ] Nherera isina baba chete [ ] Handisi Nherera [ ]	
10	Mari inowanikwa pamwedzi pamusha penyu yakawanda sei? (RTGS$)	≤100 [ ] >100 [ ]	
CHIKAMU CHEPIRI: ZVINOINDIRANA NEDUNGAMUNHU MUKUSATORA MAPIRITSI ZVAKANAKA			
11	Chii chinonzi HIV?		
12	Chii chinonzi AIDS?		
13	HIV inotapuriranwa sei?	-Kusangana pabonde musina kudzivirira [ ] -Kupfekedzana mbatya [ ] -Kushandisa midziyo yemumba pamwe nemurwere [ ] -Mvura dzemumiviri [ ] Zvimwe	*Makai mhinduro dzamunotendera na nadzo dzose.*
14	Pamwedzi mitatu yapfuura iyi pane pawakambo kanganwa kumwa mishonga yekuderedza utachiwana hwe HIV here?	Hongu [ ] Kwete [ ] Handizivi [ ]	*Kana mati kwete kumubvunzo 10, chiendai kumubvunzo 12*
15	Kana mati hongu kumubvunzo 13, mangani mapiritsi amusina kumwa?	Nhamba yemapiritsi [ ]	*Kana musina kumbodarikira kumwa isai "**0**"*
16	Wakambo kanganisikawo here nemapiritsi ekuderedza utachiwana hwe HIV.	Hongu [ ] Kwete [ ]	*Kana wati kwete kumubvunzo 16, darikira uende kumubvunzo 18*
17	Kana ati Hongu ku mubvunzo 15 makai paboka remishonga	1st Line [ ] 2nd Line [ ] 3rd Line [ ]	
18	Unoziva here kuti	Hongu [ ] Kwete [ ]	

	mapritsi ekuderedza utachiwana anomwiwa kweupenyu hwese?		
19	Do you know that the time at which medication is taken influences its effectiveness?	Yes [ ] No [ ]	
20	Unoziva here kuti kudarikira kumwa mapiritsi kana kunonoka kumatora kana kumatora zvisizvo ndizvo zvinotidza kumwiwa kwemapiritsi uye kushanda kwawo kwakanaka?	Hongu [ ] Kwete [ ]	
21	Unoitawo zvinotevera here izo?	Kuenda kuchikoro Hongu [ ] Kwete [ ] Kumwa doro Hongu [ ] Kwete [ ] Kusarara pamba Hongu [ ] Kwete[ ] kunokorokoza kumighodhi Hongu [ ] Kwete [ ] Kuita mabasa madiki kumwe Hongu [ ] Kwete [ ] Zvimwe	
22	Pane zvadomwa pamubvunzo 15 pane zvakambokutadzi sa kutora mapiritsi ako here?	Hongu [ ] Kwete [ ] Handizivi [ ]	
23	Unoona kukosha here kwekutora mapiritsi eHIV?	Hongu [ ] Kwete [ ]	
24	Ipai zvikonzero zvemhinduro yawapa pamubvunzo 17?	....	
25	Unombobuda pachena here kuhama kana shamwari nezvekumwa kwako mapiritsi ekudedza HIV?	Hongu [ ] Kwete [ ]	.

26	Kana wati KWETE pa 19, nemhaka yei?	…… ……	
27	Kana wati hongu kumubvunzo 19, wakabuda pachena kunaani?	Mubereki/Muchengeti [ ] Shamwari [ ] Murume kana mukadzi wangu [ ]	
28	Une dzimwe nzira here dzaunoshandisa kurapa utachiwana hwe HIV?	Hongu [ ] Kwete [ ]	
29	Kana ,wati Hongu kumubvunzo 22, unoshandisa nzira dzipi?		*Nyora nzira dzose dzunoshandisa*
CHIKAMU CHETATU: ZVINOINDIRANA NETSIKA NEMAGARIRO MUKUSATORA MAPIRITSI ZVAKANAKA			
30	Rudzi rwenyu runokutendera here kuti utore mapiritsi ekuderedza HIV?	Hongu [ ] Kwete [ ]	
31	Unopiwa mukana here wekuenda kuchipatara kunorapwa	Hongu [ ] Kwete [ ]	
CHIKAMU CHECHINA: HZVINOINDIRANA NEZVEUTANO MUKUTUSATORA MAPIRITSI ZVAKANA			
32	Murikure zvakadii nechipatara chiripadhuze kwamunotorera mapiritsi?	<10 Km [ ] >10 KM [ ]	
33	Pane mamwe ma purogiramu here anoita nezve utachiwana hwe HIV amunombopinda wo maari pa chipatara chiri pedo nemi?	Hongu [ ] Kwete [ ]	*Kana wati Kwete kumubvunzo 29, darikirai mubvunzo 30 uende kumubvunzo 31.*
34	Kana wati Hongu kumubvunzo 29, ndeapi mapurogiramu	Ezve maKondomu [ ] Ezve CATS [ ] Kana paine mamwe tsanangurai pano	

	amunopindawo maari?		
35	Mishonga yekuderedza utachiwana hwe HIV inowanikwa nguva dzose here pachipatara chenyu?	Hongu [ ] Kwete [ ]	*Kana wati HONGU kumubvunzo 31 darikira mubvunzo 32 uende kumubvunzo 33.*
36	Kana wati kwete kumubvunzo 31, unoita sei kuti uwane mishonga wako?	ndoinda kunotsvaka pachipara chinotevera [ ] ndoenda ku Chipatara chikuru chemu Dhistrikiti [ ] Ndinomirira kusvika mapiritsi awanikwa pachipatara pedu [ ]	
37	unogara nguva yakareba sei wakamirira kubatsirwa kuti uwane mapiritsi pachipatara penyu ?	Maminitsi ari pasi pe 30 [ ] Maminitsi anokwana 30-60 [ ] Maminitsi anodarika 60 [ ]	
38	Munobhadhara mari dzekuti mubatsirwe pachipatara kuti muwane mishonga yenyu?	Hongu [ ] Kwete [ ] Nedzimwe Nguva [ ]	
39	Vashandi vezveutano vanokudzidzisai ukoshwa hwekumwa mishonga yenyu zvakanaka here	Hongu [ ] Kwete [ ]	
CHIKAMU CHECHISHANU: ZVINOINDIRANA NEKUMWA MAPIRITSI NGUVA DZAKAFANIRA UYE NOMAZVO*(Mibvunzo yeMorisky 8-Item ART Adherence)* (Mhinduro ***Hongu/Kwete Hongu=1 uye Kwete=0)***			
40	Munombokanganwa here kutora mapiritsi enyu ekuderedza utachiwana hwe HIV?	Hongu [ ] Kwete [ ]	
41	Vanhu dzimwe nguva vanokanganwa kumwa mapiritsi avo nezvimwe zvikonzero se kukanganwa.	Hongu [ ] Kwete [ ]	

	Unorangarira here pamasvondo maviri apfuura aya, pane mazuva here ausina kutora mapiritsi ako?		
42	Wakambomira here kumwa mapiritsi ako usina kuudza mukoti kana Chiremba wepachipatara, nekuti waikanganisika kana wamwa mapiritsi?	Hongu [ ] Kwete [ ]	
43	Paunofamba kana kubva pamba penyu, unombokanganwa kutakura mapiritsi ako here?	Hongu [ ] Kwete [ ]	
44	Wakatora mapiritsi ako ose here nezuro?	Hongu [ ] Kwete [ ]	
45	Paunonzwa kunge wavanani pakurwara, unomboregedza here kutora mapiritsi ako?	Hongu [ ] Kwete [ ]	
46	Kutora mapiritsi mazuva ose kunokanganisa vamwe vanhu. Unombonetseka here nekuteedzera urongwa hwekumwa mapiritsi ako?	Hongu [ ] Kwete [ ]	
47	Kakawanda sei paunombotadza kurangarira kutora mapiritsi ako ose? - A.hazviitie/nenguva dziri kure - B. Kamwe panguva		*A =0* *B kusvika E =1*

	refu. -C. Nedzimwe nguva -D. Kazhinji -E. Nguva Dzose		
ZVIBODZWA Zvibodzwa >2 = hateedziri kumwiwa kwemapiritsi kwakanaka. 1 kana 2 = Hateedzeri kumwa mapiritsi kwakanaka asi arinani 0 = anomwa mapiritsi zvakanakisa			

DEPARTMENT OF COMMUNITY MEDICINE

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APPENDIX 9

STIGMA AND DISCRIMINATION ASSESMENT QUESTIONNAIRE (ENGLISH VERSION) [*This should attached and ansewered together with the main questionnaire (Annex 3A)*]

My name is Chamunorwa Mhembe. I am a Public Health Officer attached at Kadoma City council Health Department. I am conducting a study to determine factors associated with non-adherence to ART among adolescents in Sanyati District. I would like to ask you questions pertaining to this study.

Stigma and discrimination rating scale

<15 Very low	15-29 Low	30-40 Moderate	45-49 High	>60 Very high

Questionnaire

Serial	Question	Response
1.	Have you experienced stigma from last year up to this date?	Yes [ ] No [ ]
2.	Are you concerned about disclosing your HIV status?	Yes [ ] No [ ]
3.	Do you blame HIV for	Yes [ ] No [ ]

	your illness?	
4.	Do you think HIV is a punishment from God?	Yes [ ] No [ ]
5	Have you experienced stigma or discrimination from any of the following:	**Family/Family Activities** Yes [ ] No [ ] **Religion/Religion Activities** Yes [ ] No [ ] **Health Care** Confidentiality Yes [ ] No [ ] Access to ART Yes [ ] No [ ] Family Planning & Sexual reproductive Yes [ ] No [ ] **Education** Yes [ ] No [ ] **Gender** Yes [ ] No [ ] **Employment** Yes [ ] No [ ] **Community/Community** **Activities** Yes [ ] No [ ]

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APPENDIX 10

MIBVUNZO YEKUONGORORA RUSARURO (SHONA VERSION) [*This should attached and ansewered together with the main questionnaire (Annex 3B)*]

Makadii zvenyu? Zita rangu ndinonzi Chamunorwa Mhembe. Ndiri muongorori hweutano ndichishandira kuKanzuru yeKadoma City. Ndiri kuitawo tsvakiridzo yekuda kuziva zvinhu zvangabatanidzirwa nekusatora mapiritsi anoderedza utachiwana hwechirwere che Shuramatongo muno munharaunda ye Sanyati.Ndinokumbirawo kukubvunzai mibvunzo mayererano nezve tsvakiridzo iyi.

Chikero chekupima rusaruroe

<15 Very low	15-29 Low	30-40 Moderate	45-49 High	>60 Very high

Mibvunzo

Nhamba Yemubvunzo	**Mubvunzo**	**Mhinduro**
1.	Wakambosanganawo nerusaruro kubva mugore rakapera kusvika parinhasi?	Yes [ ] No [ ]
2.	Une kushushikana here nekuda kwekuti une utachiwana hwe HIV?	Yes [ ] No [ ]

3.	Unopomera utachiwana hwe HIV here pakurwara kwaunomboita?	Yes [ ] No [ ]
4.	Unofungawo here kuti kuva neutachiwan hwe HIV murango wamwari?	Yes [ ] No [ ]
5	Wakambosangana nerusaruro here nekuda kwekuti unorarama neutachiwana hwe HIV kune zvinotevera?	**Mumhuri** Hongu [ ] Kwete [ ] **Muchitendero** Hongu [ ] Kwete [ ] **Munezveutano** Zvakavanzika Hongu [ ] Kwete [ ] Mukuwana Mapiritsi e HIV Hongu [ ] Kwete [ ] Munezvekuronga mhuri Hongu [ ] Kwete [ ] **Munezvedzidzo** Hongu [ ] Kwete [ ] Munezvekuenzaniswa kwemikana Hongu [ ] Kwete [ ] **Munezvemabasa** Hongu [ ] Kwete [ ] **Munharaunda yaunogara Hongu** [ ] Kwete [ ]

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APPENDIX 11

Key Informants Questionnaire
Determinants of Non-Adherence to Antiretroviral Therapy among HIV positive Adolescents in the Mining District of Sanyati, Mashonaland West Province, Zimbabwe, 2019

Questionnaire No: _____ Date: _____

1. What is your Designation? _____

2. Sex
   a) Female [ ]
   b) Male [ ]

3. How long have you been in your current position? _____Years

4. Have you conducted any awareness campaigns educating adolescents on the benefits of adherence to ART?

Yes [ ] No [ ]

5. If yes, how often? _____

6. What advice do you give on treatment adherence to adolescents living with HIV?

_____
_____
_____

6. Do you have adequate resources to support adolescents who are on treatment in Sanyati District?

Yes [ ] No [ ]

7. If no, what resources are inadequate? Please specify on the space provided below.

_____
_____

8. In your opinion what are the major factors contributing to non-adherence among HIV positive adolescents in the mining District of Sanyati?

_____
_____
_____

9. What are the possible reasons for high non-adherence rate among adolescents in Sanati District?

_____
_____
_____

10. What do you suggest, can be done to improve adherence to ART among adolescents in Sanyati District?

_____
_____
_____

11. What is the government (MoHCC) policy and guidelines in relation to ART for adolescents? (*Please specify)*

_____
_____
_____

12. Do you have a copy of ART guidelines at your health facility?

Yes [ ] No [ ]

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APPENDIX 12

Checklist for adherence data from patient's clinical records (January 2018-June 2019)

Checklist No._____ Name of Health Facility_____
Date of review_____

1. Did the patient miss any review date? Yes [ ] No [ ]

2. If **Yes** to question 1, When (date).....
*(If **Yes** to question 1, Check the Pharmacy register if the patient did not collect ART medicines from the Pharmacy, without passing through the OI clinic)*

3. Did the patient experience any adverse effects due to ART medicines? Yes [ ] No [ ]

4. If **Yes** to question 3, list ART medicines which were involved
.....
.....
.....
.....
.....

5. Did the patient miss 5% of his/her ART doses within a 30 day period? Yes [ ] No [ ]

6 If Yes to question 5, When (*date*).....

5. Does the patient have history of not following instructions from the clinicians?

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APPENDIX 13

Checklist for assessing availability of ART medicines at the health facility, Sanyati District, 2019

Name of health facility_____
Date of review_____

Item	History of stock outs	Current stock	Required minimum stock	Out of stock	Comments
1st line antiretroviral drugs					
Nevirapine					
Dolutegravir					
Tenofovir					
Lamivudine					
Abacavir					
Lopinavir					
Zidovudine					
2nd line antiretroviral drugs					
Lopinavir					
Atazanavir					
Ritonavir					
Raltegravir					

APPENDIX 14: JOINT RESEARCH ETHICS COMMITTE APPROVAL

University of Zimbabwe
College of Health Sciences

Joint Research Ethics Committee
For The University of Zimbabwe,
College of Health Sciences and
Parirenyatwa Group of Hospitals

JREC Office No. 4, 5th Floor College of Health Sciences Building
Telephone: +263 4 708140/ 791631 Exts 2241/2242
Email:jrec.office@gmail.com/jrec@medsch.uz.ac.zw, website:www.jrec.uz.ac.zw

Parirenyatwa
Group of Hospitals

APPROVAL LETTER

Date: 26 July 2019 **JREC Ref: 166/19**

Names of Researcher Chamunorwa Mhembe
Address: Department of Community Medicine

RE: DETERMINANTS OF NON-ADHERENCE TO ANTIRETROVIRAL THERAPY AMONG HIV POSITIVE ADOLESCENTS IN THE MINING DISTRICT OF SANYATI, MASHONALAND WEST PROVINCE, ZIMBABWE, 2019.

Thank you for your application for ethical review of the above mentioned research to the Joint Research Ethics Committee. Please be advised that the Joint Research Ethics Committee has reviewed and approved your application to conduct the above named study. You are still required to obtain MRCZ and RCZ approval before you commence the study if required by the nature of your study.

- **APPROVAL NUMBER:** **JREC/166/19**
- **APPROVAL DATE:** **26 July 2019**
- **EXPIRY DATE:** **25 July 2020**

This approval is based on the review and approval of the following documents that were submitted to the Joint Ethics Committee:

a) Completed Application Form
b) Full Study Protocol
c) Informed Consent in English and/or appropriate local language

After this date the study may only continue upon renewal. For purposes of renewal please submit a completed renewal form (obtainable from the JREC office) and the following documents before the expiry date:

a. Progress report
b. A Summary of adverse events
c. A DSMB report

OHRP IRB Number: IORG 00008914
PARIRENYATWA GROUP OF HOSPITALS FWA: 00019350

APPENDIX 15: MEDICAL RESEARCH COUNCIL APPROVAL

Telephone: 791792 791193
Telefax 4263) - 4 - 790715
E-mail: mrcz@mrcz.org.zw
Website: http://www.mrcz.org.zw

Medical Research Council of Zimbabwe
Josiah Tongogara / Mazoe Street
P. O. Box CY 573
Causeway
Harare

APPROVAL

REF: MRCZ/B/1765

14 August 2019

Mhembe Chamunorwa
UZCHS-Department of Community Medicine
P O Box A 178
Avondale
Harare

RE: Determinants of non-adherence to antiretroviral treatment among HIV positive adolescents in the mining district of Sanyati, Mashonaland West Province, Zimbabwe, 2019

Thank you for the application for review of Research Activity that you submitted to the Medical Research Council of Zimbabwe (MRCZ). Please be advised that the Medical Research Council of Zimbabwe has **reviewed** and **approved** your application to conduct the above titled study.

This approval is based on the review and approval of the following documents that were submitted to MRCZ for review:-

1. Completed MRCZ 101 form
2. Full protocol

- **APPROVAL NUMBER : MRCZ/B/1765**

This number should be used on all correspondence, consent forms and documents as appropriate.

- **TYPE OF MEETING : EXPEDITED**
- **APPROVAL DATE : 14 August 2019**
- **EXPIRATION DATE : 13 August 2020**

After this date, this project may only continue upon renewal. For purposes of renewal, a progress report on a standard form obtainable from the MRCZ Offices should be submitted three months before the expiration date for continuing review.

- **SERIOUS ADVERSE EVENT REPORTING**: All serious problems having to do with subject safety must be reported to the Institutional Ethical Review Committee (IERC) as well as the MRCZ within 3 working days using standard forms obtainable from the MRCZ Offices or website.
- **MODIFICATIONS**: Prior MRCZ and IERC approval using standard forms obtainable from the MRCZ Offices is required before implementing any changes in the Protocol (including changes in the consent documents).
- **TERMINATION OF STUDY**: On termination of a study, a report has to be submitted to the MRCZ using standard forms obtainable from the MRCZ Offices or website.
- **QUESTIONS**: Please contact the MRCZ on Telephone No. (0242) 791792, 791193 or by e-mail on mrcz@mrcz.org.zw

Other

- Please be reminded to send in copies of your research results for our records as well as for Health Research Database.
- You're also encouraged to submit electronic copies of your publications in peer-reviewed journals that may emanate from this study.
- In addition to this approval, all clinical trials involving drugs, devices and biologics (including other studies focusing on registered drugs) require approval of Medicines Control Authority of Zimbabwe (MCAZ) before commencement.

Yours Faithfully

.....

MRCZ SECRETARIAT
FOR CHAIRPERSON
MEDICAL RESEARCH COUNCIL OF ZIMBABWE

MEDICAL RESEARCH COUNCIL OF ZIMBABWE
2019 -08- 14
APPROVED
P.O. BOX CY 573 CAUSEWAY, HARARE

PROMOTING THE ETHICAL CONDUCT OF HEALTH RESEARCH

APPENDIX 16: APPROVAL FROM SANYATI DISTRICT

Telephone: +263-68-22066-9
All correspondences to be addressed to the District Medical Officer
Fax: +263-68-22073
E-mail: kadomahospital@gmail.com

ZIMBABWE

Reference:

Ministry of Health and Child Care
Sanyati/Mhondoro-Ngezi District
P O Box 1147
KADOMA

28 May 2019

C. Mhembe
Public Health Officer
Kadoma City Health
P.O. Box 460
KADOMA

REQUEST FOR AUTHORITY TO CONDUCT A STUDY ON DETERMINANTS OF NON-ADHERENCE TO ANTIRETROVIRAL THERAPY AMONG ADOLESCENTS IN SANYATI DISTRICT

Your letter with the above reference refers. You have been granted permission to conduct a study on determinants of non-adherence to antiretroviral therapy among adolescents in Sanyati District.

You will be expected to share your findings with the District Health Executive.

Thank you.

D.M.O. SANYATI DISTRICT HEALTH
29 MAY 2019
P.O. BOX 1147, KADOMA
ZIMBABWE

Dr N. Munosiyei
DMO – Sanyati District

c.c. DNO
File