

RISK FACTORS FOR HIV/AIDS AMONG PATIENTS ATTENDING
ANTI RETROVIRAL TREATMENT CENTERS IN NORTH-EAST
DISTRICT OF BENUE STATE, NIGERIA 2012

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STATE, NIGERIA 2012**

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**A DISSERTATION SUBMITTED TO THE POSTGRADUATE SCHOOL OF THE
AHMADU BELLO UNIVERSITY ZARIA NIGERIA**

**IN PARTIAL FULFILLMENT FOR THE AWARD OF MASTER OF PUBLIC HEALTH
FIELD EPIDEMIOLOGY**

**DEPARTMENT OF COMMUNITY MEDICINE,
FACULTY OF MEDICINE,
AHMADU BELLO UNIVERSITY,
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FEBRUARY, 2014

ATTESTATION

I declare that the work in the dissertation entitled “risk factors for HIV/AIDS among patients attending Anti Retroviral Treatment Centers in North East District of Benue State, Nigeria” has been performed by me in the Department of Community Medicine under the supervision of Dr Sufiyan M. B and Dr Tukur Dahiru. The information derived from the literature has been duly acknowledged in the text and a list of references provided. No part of this dissertation was previously presented for another degree or diploma at any university.

Dr Igbabul Shember- Agela

Signature

Date

CERTIFICATION

This thesis entitled, **“RISK FACTORS FOR HIV/AIDS AMONG PATIENTS ATTENDING ANTI RETROVIRAL TREATMENT CENTERS IN NORTH-EAST DISTRICT OF BENUE STATE, NIGERIA 2012 ”** by **Igbabul, Shember-Agela** meets the regulations governing the award of the degree of Master in Public Health of Ahmadu Bello University, and is approved for its contribution to knowledge and literary presentation.

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DEDICATION

This academic work is dedicated with indelible fond memories to my mother, Late Mama Maria Nezan Agela nee Kwagh kumbul who gave birth to me, to Grandma Nguuma Igbabul nee Kortar Ibean who sowed the seed and set my feet on the path of western education and to my uncle Late AWO Hillary Hilejime Igbabul who watered this seed to growth.

ACKNOWLEDGEMENT

I glorify God Almighty for His mercies, divine protection, enablement, and guidance towards the completion of this work.

Special gratitude is expressed to Dr Sufiyan M. B. and Dr Dahiru Tukur who supervised this project.

Associate Prof. Gabrielle Poggensee, Dr Patrick Nguku and Nigeria Field Epidemiology and Laboratory Training Programme are specially acknowledged for their immense support to the success of this project.

Dr (Mrs) Bibiana Dooshima Igbabul is specially appreciated for her love, understanding and holistic support throughout the period of my study.

I am sincerely grateful to my children, Kator, Soose and Nguemo who not only tolerated my absence from home but also provided invaluable assistance in documentation.

Special thanks to the research assistants, the patients in all the comprehensive anti retroviral centers in Benue North East district for their cooperation that led to the success of this work.

I remain indebted to Mr. and Bar (Mrs.) Samuel Ngobua for their fraternal love, generosity and kind support.

Dr Kumba J. I- Director Public health and Dr Kur Jonathan-State Epidemiologist, the staff of Benue State ministry of health are appreciated for their support.

Many thanks to Benue State ministry of Health and Human Services and the Executive Secretary Benue State Agency for control of HIV/AIDS- Mrs. Grace Ashi Wende , who provided some resource materials for this work

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LIST OF ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
ANC	Ante-natal care
ART	Anti Retroviral Therapy
ARV	Anti Retroviral drugs
BCC	Behaviour Change Communication
BENSACA	Benue State AIDS Control Agency
CBO	Community-Based Organisation
C. I.	95% Confidence Interval
CSO	Civil Society Organisation
DHS	Demographic and Health Survey
FBH	Faith-Based Hospitals
FCT	Federal Capital Territory
FMOH	Federal Ministry of Health
FSW	Female Sex Workers
GoN	Government of Nigeria
HBC	Home-based Care
HCT	HIV Counselling and Testing

HIV	Human Immunodeficiency Virus
IBBSS	Integrated Biological and Behavioural Surveillance Survey
LGA	Local Government Area
MARPs	Most at Risk Populations
NGO	Non-Governmental Organisation
NDLEA	National Drug Law Enforcement Agency
OR	Odds Ratio
OVC	Orphans and Vulnerable Children
PLWHA	Person(s) Living with HIV/AIDS
PMTCT	Prevention of Mother-to-Child Transmission
SACP	State HIV/AIDS Control Program
STI	Sexually Transmitted Infection

SUMMARY

Benue State has consistently maintained the lead in high HIV prevalence in Nigeria in the past 20 years. Factors associated with HIV infection in Ant-Retroviral Treatment (ART) clients have not been well characterized in Benue State. This study was carried out to determine the association between demographic and behavioral risk variables and HIV infection among people visiting comprehensive anti-retroviral treatment centers in the study area.

A case-control study design with a two stage sampling technique was used. Cases (n=204) sampled from pre-ART and ART registered clients and controls (n=204) sampled from HIV Counseling and Testing (HCT) sites and blood donors at the blood banks co-located in the 12 Comprehensive ART centers in the study area. A structured questionnaire was used to compare cases to controls by socio-demographics, and risk behaviors that predispose them to HIV infection. Frequencies and odds ratios were obtained by univariate and bivariate analysis. Significant attributes were further subjected to multivariate and regression analysis with EPI info version 3.3.5 software

The Cases were generally older (mean age =32 years) as compared to the controls (mean age=30 years) and also the male cases were older (mean age =34.7 years) as compared to the female cases (mean age=27.9 years). The Mean age at sex debut for female was 16 years. Mean male age at sex debut was 17 years. Cases that had multiple sexual partners in life (Odds ratio [OR] = 22.3, 95% Confidence Interval [CI] = 9.4-52.5), habitually used alcohol prior to sex act (OR=10.7, 95% CI= 3.0-38.1) and had engaged in contractual sex (OR=8.4, 95% CI=2.6-27.1) were several times more likely to be associated with HIV risk of infection compared to the controls. Cases that engaged in unprotected sexual intercourse (OR=5.7, 95% CI=2.41-13.48)

and who had a positive history of Sexually Transmissible Infection in life (STI) [OR=7.1, 95% CI=3.6-14.0] and had been separated from their married partners (OR=4.0, 95% CI=1.21-13.0) were no less than three times more likely to be associated with HIV as compared to the controls. Female cases who were non consensual sex victims (OR= 4.7, 95% CI =2.1-10.6) were 5 times significantly associated with HIV infection as compared to the controls. Cases that had used mood enhancing additives in their alcohol prior to sex act were also significantly associated with HIV as compared to the controls (OR = 2.6, 95% CI =1.1-6.2). Cases that had shared domestic sharps (OR= 2.8, 95% CI = 1.5 - 5.1) and had been displaced as a result of communal conflicts (OR=3.1, 95% CI = 1.4-6.8) were also significantly associated with HIV infection as compared to the controls. Female cases especially who were ignorant of the cause of HIV (OR=3.4, 95% CI=1.66-6.96) and its common modes of prevention (OR =2.4, 95% CI = 1.13-5.02) were significantly associated with HIV as compared to the controls.

In conclusion sex debut at age less than 16 years, marital separation and multiple sex partners were significant demographic factors for HIV in the study population. Previous STI, unprotected sexual exposure to multiple sex partners, the use of alcohol and mood enhancers in alcoholic drinks prior to sex act, sharing of domestic and hair making sharps were significant risky behaviors to HIV. Displacement during communal conflict, exposure to transactional unprotected sexual intercourse while on transit in the big Nigerian cities and ignorance of the common preventive measure for HIV were significant social factors associated with HIV in this study population. Target driven health interventions are urgently needed in this community.

Key words: Anti-retroviral treatment, HIV/AIDS, risk factors, Benue State, Nigeria

INTRODUCTION

1.1 Background

Although archaeological studies have documented human infections with Human Immune Deficiency Virus (HIV) prior to 1970, we do not know how many people developed Acquired Immune deficiency Syndrome (AIDS) earlier than 1970. Available data suggest that the initial reported cases in heterosexuals started in the mid- to late 1970s and by 1990, HIV had spread to at least five continents (North America, South America, Europe, Africa and Australia). After 30 years since the official declaration of epidemic in 1981, there is still inadequate knowledge where the AIDS virus HIV originated, but it is now generally accepted that the AIDS can be traced back to Africa.¹ Since the beginning of the epidemic, more than 60 million people have been infected with the HIV and approximately 30 million people have died of AIDS. At the end of 2010, statistics show that no less than 34 million people were living with HIV, the virus that causes AIDS. Yearly, 2.7 million people become infected and 1.8 million died of AIDS.¹ WHO estimates that there were 7000 new HIV infections daily in 2010 with 97% occurrence in low and medium income countries; about 1000 are in children under 15 years of age. Six thousand are in adults aged 15 years and older out of whom almost 48% are women and 42% are among young people.¹

HIV and AIDS more heavily affect Sub-Saharan Africa than any other regions of the world. Currently two-thirds of all people in the world infected with AIDS are living in this region where in some of the countries HIV infects one in five adults. In 2010, alone 1.9 million people acquired the virus and an estimated 1.2 million Africans who died of HIV-related illnesses in the same year comprised 69% of the global total of 1.8 million deaths attributable to the epidemic.²

In Nigeria, the epidemic has continued to increase in alarming proportion since 1985 when the first cases of HIV/AIDS were reported. The National prevalence rose from 1.8% in 1991 to 5.8% in 2001, slightly dropped to 4.4% in 2005, rose to 4.6% in 2008, and then dropped slightly to 4.1% in 2010. With a population of 162.5 million people, the most populous black nation in the world, Nigeria has the second largest number of people living with HIV (3.1 million) after South Africa (5.6 million). Approximately 220,000 people died from AIDS in Nigeria in 2009.³ With AIDS claiming so many lives, Nigeria's life expectancy has declined significantly. In 1991 the average life expectancy was 54 years for women and 53 years for men.⁴ In 2010 the overall life expectancy had fallen to around 52 years.³

The states with the highest prevalence in Nigeria are concentrated in the North-Central, South-East, and South-South parts of the country. They include Benue, Akwa-Ibom, Bayelsa, Anambra, Federal Capital Territory and Plateau State among others.

1.2 Problem Statement

Benue State with a population of 4.5 million people is located in the North Central geopolitical zone of Nigeria. The State has consistently had HIV prevalence above the national average in the last six series of antenatal care (ANC) surveys. Rising sharply from 1.6% in 1991 to 16.8% in 1999, Benue State HIV/AIDS prevalence declined to 13.5% in 2001 and to 9.3% in 2003. This was followed by a gradual rise 10% in 2005, 10.6% in 2008 and 12.7% in 2010.

For three decades, the epidemic has grown from concentrated outbreaks experienced amongst high-risk groups mostly in urban areas to a generalized epidemic with a rise in rural areas. The ANC estimates, though a proxy of the true epidemic clearly suggest that Benue state is contributing significantly to the burden of HIV infection of the country although the state is only about 3% of the population.⁵ The State is thus said to be in the phase of generalized explosive

HIV epidemic and its impact is now being felt in all sectors and at all levels through increasing mortality, increasing numbers of widows and orphans, declining productivity, increasing poverty and increased risk for health care workers among others. ⁶ The consistent high prevalence of HIV in Benue State over the years despite concerted interventions by government and partners at all levels has given a reason to worry about the trend of the epidemic and its impact on the people and in all sectors of the economy.

1.3 Justification

The purpose of the study is to establish the peculiar prevalent risk factors among ART clients from one out of the three districts of Benue state. This study seeks to elicit HIV risk factors from the client perspective thus providing the context for better understanding of the prevalent risk factors in the community and the basis for implementing effective intervention in the study community. The information so gathered from this study will therefore help the health department, policy makers and health personnel in redesigning appropriate intervention programs that will halt the epidemic in the study community.

Despite the several concerted efforts by the Benue state government, Development Partners, several community-based organizations and other stakeholders, the HIV/AIDS epidemic has refused to nose dive instead, the 2010 sentinel survey confirmed the position of Benue State at very high(12.7%) compared to other states in the federation.⁴ The explosive nature of the epidemic and its impact is a source of grievous worry to all. An assessment of the risk factors to HIV in the prevalent population will help demystify the epidemic drivers and also inform

evidence based decision-making on appropriate pragmatic actions that will begin to halt and reverse the epidemic in line with MDG 6.

1.3.1 Existing Gaps in Knowledge

The two yearly National HIV prevalence studies are focused on few sentinel sites. So far, St Thomas hospital is the only site out of the 12 health facilities in our study area that has been involved in previous national prevalence studies. The prevalence studies have consistently focused on pregnant women in antenatal care. National Behavioral Studies are also limited to specifically at risk populations and professions such as truck drivers, commercial/brothel sex workers, MSM, and the military. This study is focused on the general population and therefore is intended to fill up the existing knowledge gap

1.4 Research Questions

What is the association between the commonly known demographic, social, and behavioral risk factors and contracting HIV for persons attending ART clinics in Zone A Senatorial District in Benue State?

1.5 Objectives

1.5.1 General Objective

To identify the risk factors and social determinants of HIV infection among patients attending ART centers in Benue state

1.5.2 Specific Objectives

1. To describe the demographic risk factors for HIV among patients on care at anti retroviral treatment centers in Benue State
2. To study the behavioral factors influencing risks factors for HIV in the study population
3. To examine the social factors that influence HIV transmission in the study population

1.6 Scope

The study determined the risk factors to HIV from the clients under anti-retroviral treatment (ART) and care (Pre ART) attending ART comprehensive centers. Risk factors and socio-behavioral determinants prevalent among the study participants were studied.

CHAPTER TWO - LITERATURE REVIEW

2.1 Introduction

Acquired immune deficiency syndrome (AIDS) is caused by a virus call Human Immune-deficiency Virus (HIV). HIV belongs to a large group of viruses called retroviruses. They characteristically are slow growers and take a long time to establish in the body and produce adverse effect. Some retroviruses have been found in different animals such as sheep, goats, horses and cattle. The Simian Immunodeficiency Virus (SIV) is a retrovirus that affects monkeys. HIV/AIDS cases were first diagnosed in USA among gay men in the year 1980.¹ These men first presented symptoms of opportunistic infections and cancers that appeared resistant to treatment.

The virus infects the living cells of the body and makes several copies of its self, then invades and weakens the immune system making the body more vulnerable to opportunistic infections. The symptoms of HIV/AIDS are therefore that of the invading opportunistic infection. People infected and living with HIV may feel and look completely well but their immune systems may nevertheless be damaged. A person infected with HIV can pass the virus on immediately to others through contact with body fluids such as semen, vaginal fluids, blood and its products. The virus can penetrate bruised skin, mucous membranes of the vagina, rectum and urethral skin. The most common ways people get infected with HIV are

- Through having unprotected, sexual intercourse with an infected partner.

- Through injecting drugs, using an unsterilized needle or syringe that has been used by someone who is infected.
- As a baby of an HIV-infected mother, during pregnancy, labor or delivery, or through breastfeeding.

HIV is not transmitted through kissing, coughing/sneezing or sharing of cups. The virus is not transmitted by insect vectors. When used correctly and consistently, condoms are highly effective at preventing HIV transmission.

To provide effective measures that will reduce HIV transmission and halt epidemic, it is crucial to study the risk factors that fuels the HIV epidemic.

2.2 Sexual Debut and HIV Risk

Glynn et al.⁷ showed in a study in Malawi that women who achieved early menarche start sex and marry early, leading to school drop-out. There is evidence that age at sexual debut correlates with subsequent risk behavior. Those who start sex at young ages tend to have more partners⁷ and a higher risk of HIV. Furthermore, the delay between sexual debut and first marriage is another important indicator of risk⁷. This interlude can be a time of high partner change, and is associated with a higher number of partners later on.⁷ Auvert et al,⁸ reported that in urban sub-Saharan Africa, the association of HIV status with younger age at sexual debut was high, and was mainly due to an increased number of lifetime partners and longer exposure to sexual activity. This may also be due to the larger area of cervical ectopic when young.⁹ Ghosh et al¹⁰ in India did not find this factor to be significant, although the majority of women who were married in adolescence reported only one sexual partner.

2.3 Risky Sexual Behaviors

Despite the high prevalence of extramarital sexuality in Africa, levels of condom use are low, particularly with regular partners. Men often report that condoms are unnecessary within unions and should be used only with casual partners.¹¹ Further evidence provided by Ragnarsson et al¹² in Kenya show that men use condoms inconsistently with casual partners. Thus, women are susceptible to HIV infection within marriage through unprotected sex with their husband if he has had extramarital exposure to the virus. Many men rely on appearance or misconceptions to determine whether a potential partner is infected with HIV, and thus often do not use condoms, even with casual partners. Within unions, men and women frequently view condom use as a sign of unfaithfulness or lack of trust.¹³ A study in South Africa found that young women identified their ideal relationship as one in which the man makes the sexual decisions, including those concerning use of condoms.¹⁴ However, in study by Delgado et al in Guatemala, HIV positive clients who engaged in unprotected heterosexual sex gave reasons variously as ‘my partner did not want to use a condom’ and ‘that condom irritates or make my partner uncomfortable’¹⁵

Demographic survey conducted in Nigeria reported higher level of multiple partnering, high proportions of non-marital sexual exposures as well as relatively low condom use among the Benue men as compared to men from other states.¹³ This practice would greatly increase the level of risk of HIV infection among women from this area.

Yalewa et al,¹⁶ has shown higher levels of consistent condom use among old ART clients as compared to the pre ART clients. Indicating that partners of the naïve pre ART clients have a higher risk of HIV when condom is not used.

The study by Ghosh et al⁹ corroborates the observations from several other studies that having multiple partners is highly correlated with HIV infection. The same studies showed that

husbands having other wives/partners were also found to be strongly associated with HIV infection among currently married women.

Smith et al¹⁷ has shown that for women in Africa, the greatest risk to HIV lies in marriage and for such women, the greatest source of HIV is unprotected sex with their husbands. It is estimated that nearly 80% of new HIV infections among heterosexual urban residents in Africa occur within marital or cohabiting unions.¹⁸ In such cases, one partner either is HIV-positive prior to wedlock or has acquired the virus through extramarital sexual activity. Substantial evidence from Smith et al¹⁷ suggest that married men in most parts of Africa are much more likely than married women to engage in extramarital sex, and among males such activity is often socially and culturally condoned. Kenyon et al¹¹ has shown that African men commonly have concurrent marital (regular) and extramarital (casual) sex partners. In fact, although they have roughly the same number of partners as their American and European counterparts, they are more likely than Americans and Europeans to have concurrent rather than serial relationships. Some investigators have argued that this pattern of concurrency has played an important part in driving the HIV epidemic in Africa.¹⁹ Levels of concurrent sexual partnering are high in many African countries, and men are more likely than women to report having extramarital partners.¹⁹ Men in polygamous unions are less likely than those in monogamous ones to engage in extramarital sex, perhaps because of their ability to change partners within marriage.¹⁷

2.4 Discordant Partners and HIV Risk

Why do some presumably HIV exposed persons seem to remain uninfected?

There have been reports of persons who were exposed to HIV infection, yet did remain uninfected. Cornwall et al²⁰ observed that only a small minority of sexual exposures to persons who are HIV infected result in transmission of infection. The question is Why do some

presumably HIV exposed persons seem to remain uninfected? There is compelling epidemiologic evidence supporting the existence of additional factors that protect persons from acquisition of HIV infection. What are these protective factors? Lederman et al ²¹ suggest a holistic search for these protective factors in cohorts of persons unambiguously at high risk for but who have escaped HIV infection. After 30 years of the HIV pandemic, these factors remain unidentified.

2.5 Socio-economic status and HIV Risk

Recent work has documented a relationship between poverty and extramarital sexual behavior.

In societies where unemployment is high, extramarital sexual activity boosts men's self-esteem and perception of their own social standing.²² Cornwall et al ²⁰ argues that because an unemployed man is unable to fulfill traditional economic masculine roles, his sense of social recognition and manhood may be diminished and he may engage in extramarital sex as a means of fulfilling some expectations of male behavior. Poverty may also increase a woman's tolerance of infidelity; if she discovers that her husband is engaging in extramarital sexual activity, her economic dependence on him may prevent her from challenging his behavior or negotiating condom use.²² In addition, women who lack economic alternatives may become casual partners of married men and engage in transactional sex; in these relationships, the power for decisions about condom use often lies with the male.

Hallman²³ and Baird ²⁴ have suggested that Lack of education and an economic dependence on men are important risk factors for HIV infection in women and that

Schooling can be a social vaccine to prevent the spread of HIV in Sub Saharan Africa..Baird²⁴ demonstrated that conditional transfer programs can reduce family poverty, enhanced girl-child education and reduce risk to HIV in never married women from low income setting in Malawi

The study conducted in Tanzania concluded that husbands with secondary school or higher levels of education were less likely to infect their wives with HIV.²⁵ This may be because they have better knowledge of how to prevent HIV acquisition and transmission. Multiple concurrent sex partnering was found to be associated with poorest and middle households in a study by Uthman et al.²⁶

2.6 Sex work and HIV Risk

Female sex workers as the name implies sell sex for money. They may be institutionalized in brothels or work as freelance called non-brothel based. A few sex works is arranged through internet. Most sex workers worldwide are women; however, substantial populations of male and transgender sex workers exist in many countries. Sex workers are at a heightened risk of HIV infection secondary to biological, behavioral, and structural risk factors. Sex workers experience high-risk sexual exposures through high numbers of sexual partners and the high concurrency of their partners. Biologically, the high prevalence of bacterial sexually transmitted infections (STIs) in sex workers¹ and the synergistic relation between HIV and STIs further heightens the risks of HIV to themselves as well as their partners. In some settings, protective sexual practices including consistent condom use and HIV testing are higher among sex workers than among women in the general population.²⁷

Sex work is as old as humanity and several coherent structural risk factors tend to increase the vulnerability of these professionals and their clients to HIV.

Some of these structural risk factors indirectly heighten risk for HIV infection among sex workers by restricting their access to preventive health and HIV and STI services and treatment.²⁷ Udoh et al²⁷ identifies structural factors to also include the limiting influences of poverty, discrimination, and gender inequality as well as the damaging effects of physical and

sexual violence, stigma, and social exclusion. Erasquin et al ²⁸ have shown that structural factors such as the organization and power dynamics of sex work and legal and regulatory policies regarding sex work also contribute to sex workers' increased risk of HIV infection by limiting their ability to negotiate safer sex. Health enabling environments, including safer work spaces, structural support for condom promotion and distribution, and community empowerment for sex workers have been shown to reduce structural risks for HIV infection.

2.7 Cultural Events and HIV Risk

While some previous studies have examined the factors associated with high-risk sexual behavior among African men, few have considered how such behavior is influenced by a man's social, cultural and economic environment.²⁹

In Africa today, many HIV prevention messages have focused on promoting monogamy within marital or cohabiting unions even though polygamy and extra marital lifestyle is socially acceptable in such environment. A study in Abwa-Mbagen, Benue state, revealed that the most significant factor in HIV transmission was the attendance of night parties, in which increased the rate of unprotected casual sex.³⁰ Another study in the same state showed that HIV infection was associated with the number of life time partners of women.³¹

2.8 Unsafe Practices and HIV Risk

Whereas there is no evidence for a direct effect of male circumcision on the risk of women becoming infected with HIV there are few data on the direct effect of circumcision on male-to-female HIV transmission. Reports from studies show that circumcised men are at substantially lower risk of harbouring cofactors such as genital ulcer disease and herpes simplex virus type 2 which potentiate risk to HIV^{32,33} There is also increasing evidence that female partners of circumcised men also have a reduced risk of cofactors, such as genital ulcer disease and vaginal

infections such as bacterial vaginosis and trichomonas infection.^{34,35} Male circumcision therefore provides a long-term indirect protection to women by reducing the risk of heterosexual men becoming infected with HIV. Ghosh et al⁹ suggests that one-fifth of the total HIV infections in HIV-discordant couples in which only the wife was infected may have occurred through contaminated blood transfusions.

2.9 Conflict situation and HIV Risk

Rates of intimate partner violence are elevated among men who report having multiple sex partners, suggesting that there is a linkage between norms of male entitlement to sex and dominance within relationships³⁶ In such circumstances, women are particularly vulnerable to HIV infection, because they lack the power to negotiate condom use.

In many parts of Africa, young men's sexual activities are often an attempt to display sexual proficiency, however, other studies show men engage in extramarital sex simply to meet sexual desires and would likely have extramarital sex during their wives' period of postpartum abstinence, and this sex is likely to be unprotected.³⁷ Gharoro et al reported that majority of women were victims of non consensual sex in current and previous relationships.³⁸ Violence and threats of violence are associated with increased risk for sexual transmission of HIV. Women who experienced abuse were significantly less likely to have used condoms with their intimate partners and also the victims of unprotected anal sex were more likely to be HIV-infected⁹. In India, Ghosh et al⁹ also confirmed the increased risk for HIV infection among women experiencing sexual violence from their husbands

Wage labor and temporary migration also play a crucial role in HIV risk. Men have more opportunities than women to participate in wage labor and temporary migration, which provide motivation and opportunity for extramarital partnerships.¹⁹

2.10 Delayed Intervention and HIV Risk

Acute HIV infection is the period between HIV acquisition and the development of detectable antibodies against the virus. Early HIV infection, including acute infection, is characterized by rapid viral replication leading to high viral load. High viral load combined with phenotypic factors unique to the infecting virus results in greater transmission risk during early infection than during chronic stage of infection^{39, 21} Powers⁴⁰ estimated the contribution of early infection to HIV incidence in Lilongwe, Malawi, and suggested that early infection plays an important part in HIV transmission in sub Saharan Africa.

It therefore follows that acutely infected persons from resource poor settings with limited access to or highly prioritized services, will even pose a greater risk in such communities.

2.11 Breast feedings and HIV Risk

Many programs in sub Saharan Africa had recommended early weaning of breast fed infant to prevent mother-to-child transmission. Coovada and Kuhn,^{37, 41} had both recorded that exclusive breast feeding results in lower risk of HIV transmission than does nonexclusive breastfeeding during the first few months of life. However, they both recommended appropriate complementary feeding to help fortify the child's immunity and consequently safeguards against infections.

2.12 Use of Hormonal Contraceptive and HIV Risk

Family planning services are initiatives to prevent unintended pregnancies, enhance

Economic development and improve women and children's health globally.

Hormonal contraceptives methods which include daily oral pills and long acting injectables are used widely but their effects on HIV risk still remain unclear. However several studies show the

potential for hormonal contraception to increase women's risk for acquiring HIV-1, even after controlling for sexual behavior. A study by Heffron⁴² showed hormonal contraceptive use by HIV-1-seropositive women potentially increased the risk of transmitting the virus to their male partners.

2.13 Previously Documented HIV Risk Factors in the Benue Environment

Previous studies^{6, 5, 13} have observed some determinants and categorized the factors that are contributing variously to high prevalence of HIV/AIDS in the State as including the follows:

poverty and insecure livelihood , stigma and discrimination, ignorance, myths and misconception, socio-cultural factors, strategic location of the state, modernization and urbanization, conflict situations, hard drugs and alcoholism, and finally the high concentration of unformed men in the state.

CHAPTER THREE - METHODOLOGY

3.1 Study Area

Benue state, located in North central geopolitical zone of Nigeria is politically divided into 3 senatorial district Zones namely A, B and C. Zone A and B has seven Local Government Areas (LGAs) each, and zone C has nine. The Seven LGAs that make up Zone A include Katsina Ala, Konshisha, Kwande, Logo, Ukum, Ushongo and Vandeikya.

Benue Senatorial Zone A also called Benue North East district shares international boundary with Cameroun and state boundary with Taraba and Cross-Rivers States. The District has a population of 1526981 people which is (35.6%) of the state population (2012 estimate based on the 2006 national population census). The male to female ratio is 1.02:1. The Zone is endowed with vast and fertile farmland that is harnessed by a predominantly farming population. Each LGA has large markets with commercial activities that attract heavy traffic of traders and goods from far and near. The seven LGAs in the zone collectively has 256 health facilities out of which 12 are secondary health care centers with comprehensive anti retroviral treatment and care services; three offer prevention of mother to child transmission (PMTCT) services only. Most of the primary health care centers offer HIV counseling and testing services in addition to other services. Ihugh town is located in this zone and has been a sentinel site for previous ANC sentinel surveys. The HIV prevalence in Ihugh was 18.0% in 2010 whereas that of the entire State was 12.7%. There are no estimates available for the zone.

3.2 Study Design

A matched case control study was conducted on HIV/AIDS clients attending Anti-Retroviral Clinics in selected facilities and the control group made up of HIV negative persons seen at the

HCT unit or blood bank and whose HIV negative status was recorded in HCT registers or in the laboratory registers. Case patients and Controls were appropriately matched for age and sex. The study was conducted from November 2012 to March 2013.

3.3 Study population:

The study population was all persons living with HIV/AIDS who were registered with the ART clinics in the seven LGAs that make up Benue North East district of Benue state. The study population therefore included all persons living with HIV/AIDS and enrolled on pre ART and ART care at the facility six months preceding the study.

3.3.1 Inclusion Criteria

To be eligible for the study case-patient were

1. HIV positive clients enlisted in the pre ART or ART register or both within the previous six months
2. Attending the ART clinic in the study area.

Persons eligible for selection as controls were

1. HIV negative and their negative status were evidently documented in the HCT or laboratory registers.
2. HIV negative persons who had HIV test carried out in a maximum period of two weeks preceding the study.
3. HIV negative persons attending HCT/Laboratory in the same health facility where cases were found or a facility located in the same local government area where cases were found.

Matching was done based on sex and age grade.

3.3.2 Exclusion Criteria

The following were not considered among the Cases

1. All persons whose HIV status was negative or not known.
2. Cases whose names were not listed in the facility Pre-ART or ART registers.
3. Cases registered earlier than six months of the study.
4. Cases not attending ART clinic in the study area.

The control group excluded:

1. HIV positive persons.
2. Persons whose HIV negative status was not documented in the HCT or laboratory registers
3. Persons whose last HIV test was done earlier than 2weeks of conducting the study.

3.4 Sample Size Determination

The sample size for the study was the number of Case-Patients and the number of controls.

The sample size was calculated adopting the Breslau and Day formula for calculating sample size in case control study design as documented by Heinekens and Breslow.^{43, 44}

$$n = \left(\frac{r+1}{r}\right) \frac{(\bar{p})(1-\bar{p})(Z_{\beta} + Z_{\alpha/2})^2}{(p_1 - p_2)^2}$$

Where

n = minimum sample size in each group;

$(r+1)$ is a measure of variability similar to standard deviation

r = **ratio** of controls to cases

$P_1 - P_2$ = **Effect Size** (the difference in proportions)

$P(1-P)$ = Effect size, the difference in proportions

p_1 = the proportion of exposure among the cases

p_2 = the proportion of exposure among the controls

$Z_{\alpha/2}$ = Represent the Value of the standard normal deviate corresponding to a significant level of alpha typically 1.96 for a two tailed test of at 0.05 level

Z_{β} = Represents the Value of the standard normal deviate corresponding to a desired level of power typically 0.84 for a power of 80%.

In this study a power of 80% was desired and the least extreme odds ratio expected to be detected was assumed to be 2.0 The ratio of cases to controls was 1:1 (Equal number of cases to the controls, so $r = 1.0$)

The proportion of exposure to each risk factor among the control group (P_2) = 18%.*

18%* is the HIV prevalence in the only selected site (St Thomas' hospital Ihugh) from this study zone which was obtained in the 2010 HIV prevalence survey among ANC attendees⁴

- For 80% power, $Z_{\beta} = 0.84$
- For 0.05 significance level, $Z_{\alpha} = 1.96$
- $r = 1$ (equal number of cases and controls)
- The proportion exposed in the control group (P_2) = 18%

To get proportion of cases exposed this formula was applied.⁴³

$$P_{case\ exp} = \frac{OR p_{controls\ exp}}{p_{controls\ exp}(OR - 1) + 1}$$

$$P_{case\ exp} = \frac{2.0(0.18)}{(0.18)(2.0 - 1) + 1} = \frac{0.36}{1.18} = 0.31$$

Therefore, the average proportion in exposed cases = (0.31+0.18)/2=0.243

Applying the formulae for calculating the sample size for each group,

$$n = \left(\frac{r+1}{r}\right) \frac{(\bar{p})(1-\bar{p})(Z_{\beta} + Z_{\alpha/2})^2}{(p_1 - p_2)^2}$$

To obtain
$$n = 2 \frac{(0.243)(1-0.243)(0.84+1.96)^2}{(0.31-0.18)^2} = 171$$

Therefore, n=342 (171 cases, 171 controls). A generous sample size of 34(10%) was added to this calculation to take care of non response as it was observed that the questions bothered on very sensitive issues; thus the minimum sample size of 376 was obtained. Open Epi software version 2.3 was used to cross check this manual calculation. Assumptions made were Two sided confidence level (1- α) =95, Power (Chance of detecting) =80, Ratio of controls to cases=1.0(equal samples), Percentage of controls to exposed ($P_1=18\%*$), Least extreme OR ratio to be detected=2, Percentage of cases with exposure (hypothetical but automatically generated) = 30.5. Thus using Open Epi, a sample size of 368 was generated and adding 68(10%) to take care of non response, the minimum sample size of 404 (202 cases and 202 controls) was obtained. In this study a sample size of 408 was eventually used after rounding up the fractions from probability proportionate to size sampling of respondents from the facilities.

3.5 Sampling Technique

A two stage sampling technique was used. In the first stage all the 12 Secondary Health facilities in the zone that were currently offering comprehensive HIV care services were selected; this included all the seven general hospitals and all the five faith based hospitals in the study area - selected as primary sampling units.

In the second stage a probability proportionate to size sampling of all case patients and client from the selected ART centers was conducted. The most recent 6 months (2nd quarter and 3rd quarter of 2012) patient load (ART/Pre-ART Cohort) of each ART center in the zone was taken and this was added together to get a pooled client load for the 12 comprehensive ART centers. This pooled estimate was the basic sampling unit from which proportionate allocation of clients was done for the facilities based on their respective client load. After obtaining the sample allocated to each facility, the cases were selected using systematic random sampling until the desired sampling per facility was attained.

Steps that were followed in applying Probability Proportional to Size Sampling were;

1. Listing of all health facilities in the project area (12 in all) and their most recent 6 months ART/Pre ART Client load.
2. Calculation of the running cumulative client population. The last number in this column was the total client population of the project area. In the sample, the total client population , N=2699
3. The number of clients contribution by (sampled from) each health facility (Cluster) i.e. Facility Sample(FS) was obtained by dividing the 6 months ART/Pre-ART facility load ,

(FL) by the pooled sample, $N=2699$ and multiplying this by 400 and approximating to a whole number digit in order to get equal number of cases and controls.

$$\text{That is } FS = \frac{FL}{N} * 400$$

4. The above steps were performed for each of the 12 facilities subsequently until the total sample size desired is achieved in the project area.
5. At each health facility the facility load FL was divided FS to get the facility sampling interval FSI, $k = \frac{FL}{FS}$
6. The Facility sampling interval (FSI)= k, was used to select patient as enlisted in the client (ART/Pre-ART registers) in each facility..... every k^{th} person was selected.
7. Controls were selected at the counseling unit and the laboratory blood bank in the same facilities
8. The 12 ART centers were visited to conduct interviews with the desired sample size of 204 cases and 204 controls.

The ART centers are located in the seven general hospitals at the LGA headquarters and the five faith based hospital namely St. Monica's hospital Adikpo, St. Anthony's hospital Zaki Biam, NKST hospital Zaki,Biam, St. Thomas's hospital Ihugh, and NKST hospital Mbaakon.

3.6 Study Instrument

The study used a structured questionnaire to collect information from the Case-Patients and Controls. The questionnaire was interviewer administered during ART clinic sessions.

3.7 Data collection Methods

Data for this study was collected by 20 well trained research assistants. Training sessions were didactic with role modeling as well as real practical sessions with the use of the tools. The research assistants were adequately supervised. Data collection was by interviewer administered structured questionnaire. The data collection instrument contained both close and open ended questions and it gathered data on socio-demographic information of respondents, behavioral risk factors, their level of knowledge on HIV, their perceived cause of HIV, its mode of transmission and perceived modes of prevention. The content validity of the data collection instrument was established by extensive review of the literature and field-testing prior to the study. The questionnaire was field-tested in general hospital North Bank-Makurdi-an ART clinic located in Zone B Senatorial district. Zone A and B districts both share similar socio-demographic characteristics. Knowledge on HIV and the various methods of prevention was assessed by the respondents answers and graded as good fair and poor. The Scoring was done based on adding the positive responses and obtaining the average out of the total responses

3.8 Data Management

The completed questionnaires were reviewed on the field prior to electronic data entry. Double data entry was performed to minimize error. Several consistency checks were performed to exclude incomplete, inaccurate and inconsistency data; electronic data backups were created after data entry.

3.8.1 Measurement of Variables

Variables measured in this study include

1. Demographic risk factors

2. Behavioral risk factors
3. Social risk factors

Expected outcome Variables include

1. Risky sexual behaviors
2. Socio economic risks
3. Risky cultural exposures
4. Unsafe practices

3.8.2 Data Analysis

Data analysis was performed using Epi-info software version 3.5.1. Univariate data analysis was carried out to obtain means and frequency. Bivariate data analysis was conducted using 2 X 2 tables to examine the strength of association of the risk factors and the outcome of our interest, which is HIV status. Chi-square test was used to determine statistical significance. Factors that were significant at bivariate analysis were further subjected to unconditional logistic regression to control for effect modification and confounding.

3.9 Ethical Consideration

Ethical clearance for the use of human subjects was obtained from the ethical review board of the Ahmadu Bello University Teaching Hospital Zaria, Benue State Ministry of Health and Human Services (appendix3 &4). Before administering the questionnaire, the purpose of the research was lucidly explained to each respondent. Respondents were free to decline to participate and this did not affect their care. In addition, full written informed consent from each respondent was obtained. (See appendix 2) The parents or caregivers consent for respondents who were less than 18 years was also obtained. The safety of the respondents and research team was priority and where this could not be guaranteed, the interview did not take place. The participants were

informed of confidentiality procedures such as that their names were not recorded on the questionnaire; trained research assistants did not divulge information given. Interviews were held in a private setting. All completed questionnaires were kept under protective custody. The computers used for data entries were password-protected. Prior to this, during training of research assistants, the sensitive nature of the interviews and the importance of keeping respondents information confidential were repeatedly emphasized.

3.10 Limitations and Efforts made to reduce the Effects of Limitations

3.10.1 Limitations

Some of the notable limitations in this study were

1. Funding and time were limited resource in this study.
2. Long refill time of the respondent's necessitated several visits to the facility to track the respondents.
3. Obtaining respondents confidence and cooperation in discussing such a sensitive issues on sexuality.

3.10.1 Effort Made To Reduce the Effects of Limitations

The existing structure and the networking system of the State TB Control program was used were necessary to cushion the effect on scarce manpower and funding. Research assistants were sourced locally from each Health facility. Ability to communicate effectively in the local dialects and English were required criteria in the selection of the interviewers.

CHAPTER FOUR - RESULTS

4.1 Baseline Socio-demographic data

Table 1: Socio- Demographic Characteristics Of Respondents.

Characteristic	Cases N=204 Frequencies (%)	Controls N=204 frequencies (%)
Age		
Mean Male	34.7	32
Mean Female	27.8	27
Median Male	33	30
Median Female	27	25
Male age Range	15-65	18-55
Female age Range	18-43	16-50
Religion		
Christians	188(92.2)	192(94.1)
Islam	7(3.4)	5(2.5)
Pagan	9(4.4)	7(3.5)
Tribe		
Tiv	164(80.4)	160(78.4)
Ibo	13(6.4)	12(5.9)
Idoma	8(3.9)	7(3.4)
Etulo	7(3.4)	6(2.9)
Hausa	6(2.9)	6(2.9)
Other Nigerians	6(2.9)	13(6.4)
Occupation		
Business/Trading	60(29.4)	48 (23.5)
Farming	59(28.9)	46 (22.5)
Employed for wage	44 (21.6)	46 (22.5)
Housewife	33 (16.2)	39 (19.1)
Student	6 (2.9)	18 (8.8)
Applicant	2 (1)	7 (3.4)

The Male Controls had a mean age of 32, median 30, mode 30 and Range 18-55.

Females control group had mean age of 27, Median 25, Mode 23 and Range 16-50

The males recruited were of higher age group in both the cases and controls compared to the females in both groups. Male Cases had a mean age of 34.69 years, median age of 33 years and modal age of 30 years. The age range of the male cases was 15-65 years. Female Cases had a mean age of 27.8years, median age of 27years and modal age of 30 years. The age range for female cases was 18-43 years.

Over 90 % of the respondents (both cases and controls) were Christians; among the Christians, majority 84 (45.7%) were of the catholic faith followed by 63(33.5%) who were NKST. Majority (over 75%) of the respondents were of Tiv tribe, the rest were a mixture of other Nigerian tribes.

Sixty (29.4%) of the 204 cases were engaged in business and or trading, 59 (28.9%) were farmers and only 44 (21.6%) were gainfully employed on a wage. The control group were made up of 48 (23.5%) business/ trading, 46 (22.5%) were farmers and 46 (22.5%) were gainfully employed for a wage.

Table 2: Socio- Demographic Characteristics of Respondents.

Characteristic	Cases N=204 n (%)	Controls N=204 n (%)
Highest level of education		
<i>Lower education</i>	73 (35.9)	52 (27.5)
None	24 (11.8)	21 (10.3)
Primary	45 (22.1)	33 (16.2)
Quaranic	4 (2.0)	2 (1.0)
<i>Higher education</i>	131 (64.2)	148 (72.5)
Secondary	93 (45.6)	97 (47.5)
Tertiary	38 (18.6)	51 (25.0)
Marital Status		
Married	115(56.4)	115 (56.4)
Single	53 (26.0)	77 (37.7)
Divorced/Separated	26 (12.7)	10 (4.9)
Co-habiting	1(0.5)	0 (0.0)
Widowed	9 (4.4)	2 (1.0)

Most of the cases, 131 (64.2%) had higher education and 73 (35.9 %) had lower or non formal education whereas majority 148 (72.5%) of the controls had higher forms of education and 52 (27.5%) were exposed to primary or non formal education.

Majority of the respondents, 115(56.4%) were married. The control group had more singles 77 (37.7%) than the cases 53 (26%) .There were more divorced/separated persons among the cases 26 (12.7%) than the control 10 (4.9%).

4.2 Socio-Behavioral Factors

Table 3: Travel Characteristic of Respondents.

Characteristic	Cases N=204 n (%)	Controls N=204 n (%)
Travel Destination		
<i>Local Travels</i>	23(11.3)	32(15.7)
Within the LGA	16(7.8)	14(6.8)
Within Benue State	7(3.4)	8(3.9)
<i>Out of State Travels</i>	38(18.6)	17(18.3)
Southern States in Nigeria	21(10.2)	11(5.3)
Northern States in Nigeria	17(8.4)	6(3.0)
<i>Never travelled</i>	82(40.2)	116(56.9)
Frequency of Travelling		
<i>Very Frequent</i>	54 (26.5)	30 (14.7)
Weekly	21 (10.3)	14 (6.9)
Twice monthly	11 (5.4)	3 (1.5)
Monthly	22 (10.8)	13 (6.4)
<i>Less frequent</i>	7 (3.4)	6 (2.9)
Occasionally	7 (3.4)	5 (2.5)
Annually	0 (0.0)	1 (0.5)
<i>Never</i>	143 (70.1)	168 (82.4)

Respondents who had never travelled were fewer among the cases 82(40.2%) as compared to controls 116(56.9%) and relatively fewer cases 23(11.3%) had traveled locally compared to the controls 32(15.7). The cases were very frequent travelers 54 (26.5%) compared to the controls 30 (14.7%).

Table 4: Occasions of First Interaction of Debut Sex Mate With Respondents.

Meeting Points of First Sexual Mate	Cases n=204(%)	Controls n=202(%)
<i>Public Events</i>	110 (53.9)	94 (46.6)
Social Party	39 (19.1)	39 (19.3)
Burial Ceremony	34 (16.7)	21 (10.4)
Traditional festival	19 (9.3)	16 (7.9)
Market	17 (8.3)	8 (4.0)
<i>Routine Activities</i>	95 (46.6)	118 (58.5)
Church event	1 (0.5)	10 (5.0)
In school	28 (13.7)	35 (17.3)
In neighborhood	64 (31.4)	69 (34.2)
Other occasions(in the bus)	2 (1)	4 (2)

Relatively more cases, 110 (53.9%) met their debut sexual mate at public events of social gatherings compared to the controls 94 (46.1%). In these public events, burial ceremonies were the meeting point for more cases 34 (16.7%) than the controls 21 (10.4%). Routine activities were meeting points for more controls with their sex debut mates as compared to the cases.

Table 5: Characteristics of Respondents Last Episode of STI.

Characteristics	Cases	Controls
Last Episode of STI	n=174	n=204
In the recent 5 years	158 (77.5)	39 (19.1)
More than 5 Years ago	16 (7.8)	34 (16.7)
Never in life	30 (14.7)	131 (64.2)
Treatment action after last STI	n=174	n=73
Accessed Hospital based care for STI	86 (49.4)	51 (69.9)
Opted for Out of hospital care for STI	88 (50.5)	22(30.1)
Visited Chemist Shop	78 (44.8)	18 (24.7)
Self treatment	7 (4)	2 (2.7)
Took herbs	3 (1.7)	2 (2.7)
Reasons for incomplete drug intake for STI	n=26	n=4
Felt better and stopped	13 (50)	1 (25.0)
Travelled and forgot	7 (26.9)	1 (25.0)
Suffered side effects	5 (19.2)	2 (50.0)
No improvement	1(3.8)	0 (0.0)

Majority of the cases (77.5%) had experienced STI symptoms in the recent 5 years as compared to the controls (19.1%), Fewer cases (14.7) had never had STI in their life compared to the controls (64.2%). Relatively less cases (49.4) that had STI accessed hospital care as compared to the controls (69.9%). Most of the cases (50.5%) opted for out of hospital care for STI; many of these (44.8%) went to the chemist shop for treatment. Most of the case did not complete their prescribed drugs for STI and reasons mostly advanced for this was ‘felt better and stopped’

Table 6: Frequency Of Exchanging Money Or Goods For Sex By Respondents.

Frequency of exchanging money or goods for sex	Cases n=204	Controls n=202
Never	140 (68.6)	189 (93.6)
Sometimes	30 (14.7)	5 (2.5)
All the time	20(9.8)	3 (1.5)
Only the last time	14 (6.9)	5(2.5)

More of the cases (31.4%) had engaged in transactional sex compared to the controls (6.5%)

Table 7: Respondents reasons for none or inconsistent usage of condom for sex protection.

Reasons for non/inconsistent condom usage	Cases n=179*	Controls n=120*
<i>No satisfaction</i>	89(49.7)	22 (18.4)
No satisfaction	62 (34.6)	14 (11.7)
Partner Refuses/don't want	27 (15.1)	8 (6.7)
<i>Matrimony/trust</i>	37(20.6)	61(50.8)
She is my wife/husband	14 (7.8)	28 (23.3)
We want children	16 (8.9)	25 (20.8)
I trust my partner	7 (3.9)	8 (6.7)
<i>Ignorance</i>	28 (15.7)	6 (5.0)
Dont know condom	18 (10.1)	6 (5.0)
It causes stomach/penile pain	10 (5.6)	0 (0.0)
<i>Non availability/shyness</i>	22 (12.4)	10 (8.3)
condom not available	13 (7.3)	1 (0.8)
Was Rushing	6 (3.4)	0 (0.0)
For Extramarital sex	2 (1.1)	4 (3.3)
Felt shy to buy	1 (0.6)	5 (4.2)
<i>We have same status</i>	3 (1.7)	21 (17.5)

**Not all control respondents had engaged in sexual intercourse, hence the change in numbers*

The respondents' major reason for none or inconsistent sex protection with condom was because of no satisfaction. This was more expressed among the cases (49.7%) compared to the controls (18.4%).

More controls (50.8%) compared to cases (20.6%) did not use condom because of marital reasons which bothered on trust and the desire to have children. A reason related to ignorance (15.7%) was more expressed among the cases compared to the controls.

More cases (12.4%) than controls (8.3%) gave non availability as reason for inconsistent condom use for sex protection.

A higher number of controls (17.5%) reported 'we have same status' as reasons for non condom usage for sex protection compared to the cases (1.7%)

Table 8: Category of Persons Who Engaged In Non Consensual Sex with the Female Respondents.

Non Consensual Sex Culprit	Cases n=31 (%)	Controls n=9 (%)
Fiancée/Boyfriend	20(64.5)	8 (88.9)
Stranger	10 (32.3)	1 (11.1)
Blood Relation	1 (3.2)	0 (0.0)

Majority of the respondents (both cases and controls) were raped by their fiancé/boyfriends.

Most of the cases (32.3%) were however raped by strangers compared to the controls (11.1%).

Only one of the cases was raped by a blood relation.

Table 9: Characteristics of Respondents Place of Residence.

Place of Residence	Cases n=204 (%)	Control n=204 (%)
<i>Within Benue State</i>	193 (94.6)	194 (95.1)
Within the LGA	138 (67.6)	139 (68.1)
In another LGA in Benue State	55 (27.0)	55 (27.0)
<i>In other States of Nigeria</i>	11 (5.5)	10 (5.0)
In Northern States of Nigeria	6 (3.)	6 (3.0)
In Southern States of Nigeria	5 (2.5)	4 (2.0)
Duration of stay in present residence		
<i>From 6 years and above</i>	151 (74.0)	159 (78.0)
6 to 10 years	30 (14.7)	34 (16.7)
More than 10 years	121 (59.3)	125 (61.3)
<i>Recent 5 years</i>	53 (26.0)	45 (22.1)
2 to 5 years	47 (23.0)	42 (20.6)
Less than 2 years	6 (3.0)	3 (1.5)

Majority of the respondents (>90%) were natural residents of Benue State and most of the cases (67.6%) and controls (68.1%) were residing in their home Local Government Areas (LGAs).

Majority of the respondents have been residing in their present residence within the study area for 6 or more years.

Table 10: Characteristics Of Respondents Transitory Visits To Bigger Cities In Nigeria.

Characteristics	Case n=204 (%)	Control 204(%)
Purpose of Transitory Visit to the Big City		
<i>Never went to the city</i>	124 (60.8)	131 (64.2)
<i>Work/Business related Visit</i>	36 (17.6)	25 (12.3)
Business/trading	20 (9.8)	11 (5.4)
Employment/Transfer	11 (5.4)	11 (5.4)
Job hunting	5 (2.5)	3 (1.5)
<i>Schooling/Studies</i>	19 (9.3)	25 (12.3)
<i>Family Related Visits</i>	25 (12.3)	22 (10.8)
Visiting a relative	17 (8.3)	16 (7.8)
With parents/Guardian	8 (3.9)	6 (2.9)
<i>Leisure</i>	0 (0.0)	1 (0.5)
Reasons for having sex play in the Big city		
<i>Never had sex in the city</i>	138 (67.6)	161 (78.9)
Just for fun to satisfy the urge	56 (27.5)	35 (17.2)
I needed money	6 (2.9)	0 (0.0)
My wife/husband visited	2 (1.0)	8 (3.9)
I was raped	2 (1.0)	0 (0.0)
Respondents Period of return from the Big City		
Returned 6 or more years ago	53 (66.3)	43 (58.9)
Returned in the Recent 5 years	27 (33.8)	30 (41.1)

More than half of the respondents never went to the big cities. Most of the respondents undertook transitory visits to the cities as a result of work or family related reasons. More cases 56 (27.5%) than controls 35 (17.2%) had sexual intercourse ‘just for fun to satisfy the urge’ while on transit in the cities. More than half of the respondents had returned from the cities 6 or more years ago.

Table 11: Displaced Respondent's Places of Shelter during communal hostilities

Mode of Shelter	Cases n=204(%)	Control n=204 (%)
Was Never displaced	165 (80.9)	181 (88.7)
Stayed With Relatives	28 (13.7)	19 (9.3)
Stayed with a Stranger	7 (3.4)	4 (2.0)
Stayed In a Refugee Camp	4 (3.4)	0 (0.0)

Majority of the respondents did not experience communal conflicts and were thus not displaced.

Most of the displaced respondents had stayed with their relatives, however more cases than controls had stayed with strangers and in refugee camps.

Table 12: Types of Sharps habitually shared by respondents

Types of Shared Sharps	Case n=204 (%)	Control n=204 (%)
<i>Never shared sharps objects</i>	73 (35.8)	129 (63.2)
<i>Domestic sharps</i>	73 (35.8)	39 (19.1)
Nail cutter	7 (3.4)	6 (2.9)
Razor blade	66 (32.4)	33 (16.2)
<i>Hair dressing / barbing sharps</i>	45 (22.1)	29 (14.2)
Hair plaiting Needle/Pin	4 (2.0)	3 (1.5)
Shaving clipper	41 (20.1)	26 (12.7)
<i>Work related sharps</i>	13 (6.4)	7 (3.4)
Needle and Syringes	3 (1.5)	1 (0.5)
Sewing needles	10 (4.9)	6 (2.9)

The respondents had shared in common, domestic and hair dressing sharp objects. More cases than controls had shared domestics and hair dressing/ barbing saloon related sharps cases were exposed to sharing razor blade and shaving clipper as compared to the controls

Table 13: Time respondents got exposed to last blood transfusion

Time transfused	Cases n=204 (%)	Control n=204(%)
Was Never Transfused blood in life	166 (81.4)	195 (95.6)
Had transfusion in Recent 5 years	28 (13.7)	6 (2.9)
6+ years	10 (4.9)	3 (1.5)

Over 80% of the respondents were never exposed to blood transfusion in their life. More cases 28 (13.7%) had blood transfusion in the recent 5 years than the controls 6(2.9%)

Table 14: Respondents' Knowledge on HIV Cause

Knowledge on cause of HIV	Cases n=204(%)	Controls n=204(%)
<i>Knowledgeable</i>	117 (57.4)	158 (77.5)
Virus	70 (34.3)	106 (52.0)
Germs	42 (20.6)	45 (22.1)
Sinful lifestyle	5 (2.5)	7 (3.4)
<i>Ignorant</i>	87 (42.6)	46 (22.6)
I don't Know	77 (37.7)	44 (21.6)
Witchcraft	10 (4.9)	2 (1.0)

More than half of the respondents (67.4%) were knowledgeable on the causes of HIV.

The cases were more ignorant 87(42.6%) than the controls 46(22.6%).

Table 15: Respondents knowledge on risky behaviors for contracting HIV/AIDS

Knowledge on Risky Behaviors for contracting HIV	Cases n=204 (%)	Controls n=204(%)
<i>Knowledgeable</i>	<i>167 (81.9)</i>	<i>192 (94.3)</i>
Alcoholism + Smoking +Drugs	1 (0.5)	0 (0.0)
Blood Transfusion only	1 (0.5)	0 (0.0)
Mother To Child transmission +Sex+ Blood Transfusions	6 (2.9)	15 (7.4)
Multiple Sex Partners	41 (20.1)	45 (22.1)
Prostitution	7 (3.4)	8 (3.9)
Sex, Blood Transfusion and sharing sharps	70 (34.3)	85 (41.7)
Sex and blood transfusion only	13 (6.4)	22 (10.8)
Sex and sharing of sharps	15 (7.4)	13 (6.4)
Sexual intercourse, kissing if there is a cut on the lips	0 (0.0)	1 (0.5)
Sex with a person who has HIV	1 (0.5)	0 (0.0)
Sinfulness & Punishment from God	12 (5.9)	3 (1.5)
<i>Ignorant</i>	<i>37(18.1)</i>	<i>12(5.9)</i>
I don't Know	29 (14.2)	6 (2.9)
Witchcraft/wickedness	8 (3.9)	6 (3.)

Over 80% of the respondents were knowledgeable on the risky behaviors for contracting HIV.

The cases 37 (18.1%) were more ignorant compared to the controls 12 (5.9%).

Table 16: Respondents' knowledge on ways of avoiding HIV

Knowledge on ways of avoiding HIV	Cases n=204(%)	Control n=204 (%)
<i>Knowledgeable</i>	143 (70.1)	183 (89.9)
ABC** Screen blood before transfusion. Avoid sharing sharps	137 (67.2)	167 (81.9)
Avoid kissing especially if you have mouth ulcers. Use condom.	0 (0.0)	1 (0.5)
Know your status	6 (2.9)	15 (7.4)
<i>Ignorant</i>	62 (30.4)	21 (10.3)
I don't Know	50 (24.5)	16 (7.8)
It is difficult	11 (5.4)	3 (1.5)
Witch Craft	1 (0.5)	2 (1.0)

ABC** =Abstinence, Behavioral Change and Condom use

Over 70% of the respondents were knowledgeable on the common ways of avoiding HIV infection; the cases 62 (30.4%) were however more ignorant than the controls 21 (10.3%).

4.3: Bivariate Analysis

Table 17: Demographic attributes of HIV infection

Attributes	Cases N (%)	Controls N (%)	OR (95% CI)	P Value
<i>Respondents Mean age</i>	31.6	29.8		0.03
Respondents Age Range	15 -65	16-65		
<i>Males : Mean age</i>	34.7	32.0		0.02
Males : Age Range	15-65	18-55		
Female Mean Age	27.9	27.0		0.4
Females: Age Range	16-50	16-50		
Christians	188(92.2)	192(94.1)	0.73 (0.30-1.70)	0.28
Islam and Others	16 (7.8)	12 (5.9)		
Married/Cohabiting (1)	116 (56.9)	115 (56.4)	1.02 (0.69-1.53)	0.5
Single/Divorced/Widowed (2)	88 (43.1)	89 (43.6)		
Divorced, Separated or widowed	35 (17.2)	12 (5.9)	3.31 (1.61-7.23)	0.0003
Intact marriage	169 (82.8)	192 (94.1)		
Polygamous family setting	63 (42.0)	20 (15.7)	3.87 (2.11-7.28)	0.0004
Monogamous family setting	87 (58.0)	107 (84.3)		
Non/Low Education	73 (35.8)	56 (27.5)	1.47(0.95-2.29)	0.08
Higher Education	131(64.2)	148(72.5)		
Unemployed	160 (78.4)	158(77.5)	1.059(0.65-1.74)	0.8
Employed	44(21.6)	46(22.5)		

The older aged males were significantly associated with HIV infection. HIV positive respondents were 4 times more likely to belong to a polygamous household and were also 3 times more likely to having separated from married partners as compared to the controls.

HIV infected respondents were 1.5 times more likely to have had low or no education compared to the controls, however this was not significant. Religion, marital status and unemployment were not significantly associated with HIV infection.

Table 18: Socio behavioral attributes of HIV

Attributes	Cases N (%)	Controls N (%)	OR (95% CI)	P Value
Job Involves travelling	60 (29.4)	36 (17.6)	1.9 (1.19-3.21)	0.007*
Non travel Jobs	144 (70.6)	168 (82.4)		
Out of State travelling	38 (62.3)	17 (43.6)	2.1 (0.94- 4.8)	0.1
Within Benue State travelling	23 (37.7)	22 (56.4)		
Frequent travelling: Yes	54 (88.5)	30 (83.3)	1.54 (0.3-5.9)	0.33
Occasional travelling	7 (11.5)	6 (16.7)		
Partner travels	20 (9.8)	2 (1.0)	10.9 (2.59-97.7)	0.00004*
Partner does not travels	184 (90.2)	202 (99.0)		
Living apart in the past 6 months	108 (52.9)	84 (41.2)	1.61 (1.07- 2.42)	0.022*
Living with Partner in the past 6 months	96 (47.1)	120 (58.8)		

Respondents whose jobs (or partners' jobs) involved travelling were significantly associated with HIV infection. The HIV infected persons were 1.54 times more likely to be frequent travelers than the controls; however this was not statistically significant [OR=1.54(95% CI=0.3-5.9)] however there was no strong association no matter the destinations and how frequent these travels are.

Infected persons were 1.6 times more likely to have lived apart from their sex partners for a period no less than 6 months compared to the controls [OR=1.6 (95% CI=1.07-2.42)]

Table 19: Socio behavioral attributes of HIV, Benue North East district, Nov. 2012

Attributes	Cases N (%)	Controls N (%)	OR (95% CI)	P Value
Current Sex partner is a spouse	91(44.6)	104(51.5)	0.76 (0.50- 1.14)	0.098
Current Sex partner not a spouse	113(55.4)	98 (48.5)		
Last Sex Partner was a Stranger/CSW	28(13.7)	7(3.5)	4.43 (1.83-12.3)	0.00015*
Last Sex partner was regular	176(86.3)	195 (96.5)		
Used alcohol last Sex	48(23.5)	14(6.9)	4.18 (2.16-8.49)	0.00001*
Did not use alcohol last	156(76.5)	190(93.1)		
Smoker of Cigarette	33 (16.2)	14 (6.9)	2.62 (1.31-5.47)	0.005*
Non smoker of cigarette	171 (83.8)	190 (93.1)		
Used Mood Enhancement	35 (17.2)	15 (7.4)	2.61 (1.33-5.32)	0.004*
Did not Use Mood Enhancement No	169 (82.8)	189 (92.6)		

HIV infected persons were only 24% of the times sexually exposed to their spouses as their current partners compared to the controls who were exposed 76% of the times with their married partners; however this was not statistically significant [OR=0.76 95% CI=0.5-1.14]

HIV infected persons were 4 times more likely to have been sexually exposed to a stranger (inclusive of commercial sex workers) compared to the controls who were exposed to regular sex partner [OR=4.43 (95% CI =1.83-12.3)]. HIV infected respondents were 2.6 times more likely to have used mood enhancers in their alcoholic drinks compared to the respondents. [OR=2.61 95% CI=1.33-5.32] The use of alcohol with mood enhancers and smoking habit were significantly associated with HIV infection.

Table 20: Risky Sexual Behavioral Attributes of HIV

Attributes	Cases N (%)	Controls N (%)	OR (95% CI)	P Value
Sexual Debut < 16 years	50(24.5)	23(11.3)	2.56(1.45-4.59)	0.00078*
Sexual Debut 16+ yrs	154(75.5)	181(88.7)		
2 + Sex partners past 3 months	111 (54.4)	27(13.2)	7.8 (4.69-13.3)	<0.0000001*
<2 Sex partners past 3 months	93(45.6)	177(86.8)		
2+ Sex partners past 1 year	162(79.4)	65(31.9)	8.25 (5.14- 13.3)	<0.0000001*
<2 Sex partners past 1 year	42(20.6)	139(68.1)		
3 or more partners life time	176 (86.3)	62 (30.4)	14.4 (8.53-24.6)	0.0000001*
Less than 3 Sexual partners in Life	28(13.7)	142(69.6)		
Had transactional sex play	64 (31.4)	13 (6.4)	6.68 (3.46-13.7)	0.0000001*
No transactional sex	140(68.6)	190(93.6)		

HIV infected persons were 2.5 times more likely to have had sexual debut below 16 years of age compared to the controls whose sexual debut was above 16 years of age [OR= 2.56 (95% CI=1.45-4.59)] . Age at sex debut below 16 years was positively associated with HIV infection.

Multiple sex- partnering within 3 months or 1 year intervals was positively associated with HIV infection (a dose responds relationship was observed here). Respondents who engaged in transactional sex were 7 times more likely to have HIV compared to those that did not engage in transactional sex [OR=6.68 (95% CI=3.46-13.7)]

Table 21: Risky Sexual Behavioral Attributes of HIV

Attributes	Cases N (%)	Controls N (%)	OR (95% CI)	P Value
Non Consensual sex	31 (33.3)	9 (9.9)	4.56 (1.93-11.6)	0.00024*
Sex with mutual consent	62 (66.7)	82 (90.1)		
Suffered STI in Life	174 (85.3)	73 (35.8)	10.3 (6.27-17.4)	0.0000001*
Never contracted STI in life	30 (14.7)	131 (64.2)		
Hospitable care for last STI	86 (49.4)	51 (69.9)	0.42 (0.24-0.75)	0.0049*
Out of Hospital Care for Last STI	88 (50.6)	22 (30.1)		
Current Sexual Partner Has HIV	89 (67.9)	2 (1.2)	179 (42.3-756.9)	0.000001*
Current Sexual Partner HIV Negative	42 (32.1)	169 (98.8)		
Don't know partner 's HIV status	73 (63.5)	31 (15.5)	9.5 (5.5- 16.2)	0.00001*
Status known; Partner is HIV negative	42 (36.5)	169 (84.5)		

Non consensual sex, history of STI in life, out of hospital care for contracted STIs, and current sex partner HIV positive status were all factors associated with HIV infection. Hospital based care for contracted STI was a protective factor for HIV. Ignorance of current sex partners' HIV status was an associated factor for HIV.

Table 22: Risky Sexual Behavioral Attributes of HIV

Attributes	Cases N (%)	Controls N (%)	OR (95% CI)	P Value
Last Sex Act Was Condom Protected	86 (42.2)	103 (50.5)	0.7 (0.483-1.06)	0.11
I Did Not Use Condom	118 (57.8)	101 (49.5)		
I Used Condom Consistently	25 (12.3)	85 (41.7)	0.96 (0.12-0.32)	0.0000*
Condom Use Was Inconsistent	179 (87.7)	119(58.3)		
No Condom Because We Want Children	16 (8.9)	25 (20.8)	0.37 (0.18- 0.77)	0.006*
No Condom Because Of Other Reasons	163 (91.1)	95 (79.2)		
Condom Gives No Satisfaction, Causes Stomach & Penile Pain	72 (40.2)	14 (11.7)	5.1 (2.6- 10.4)	<0.000001*
I Have Another Reason	107 (59.8)	106 (88.3)		

Only 30% of the HIV infected respondents protected themselves by the use of condom in their last sexual encounters compared to the 70% by the controls. Condom- Sex protection as a result of single use in the last sexual encounter was however statistically not significantly associated with HIV infection [OR=0.7 (95% CI=0.483-1.06)]. The HIV infected persons were 96% of the times inconsistent users of condom for sex protection compared to the control group. Consistent condom use was therefore a protective factor against HIV [OR=0.96 (95% CI=0.12-0.32)]. HIV infected partners were 37% of times refused to use condom for reasons of ‘we want to have children’ compared to the controls [OR=0.37 (95% CI=0.18- 0.77)].

HIV infected Partners were 5 times more likely to refuse using condom because ‘Condom Gives No Satisfaction, Causes Stomach & Penile Pain’ compared to the controls [OR= 5.1 (95% CI=2.6- 10.4)]

Table 23: Risky socio-Behavioral Attribute of respondents

Attributes	Cases N (%)	Controls N (%)	OR (95% CI)	P Value
Trans Anal Sexual intercourse	8 (3.9)	1 (0.5)	8.2 (1.1-365.8)	0.03836
Trans vaginal Sexual intercourse	197 (96.1)	202 (99.5)		
Have a regular sexual partner	152 (74.5)	190 (93.1)	0.22 (0.12-0.40)	0.000001
No regular partner	52 (25.5)	14 (6.9)		
Same domicile with partner for past 6months	96 (47.1)	120 (58.8)	0.62 (0.42-0.92)	0.022
Living apart from sex partner	108 (52.9)	84 (41.2)		
Age of Last Sexual Partner< 31	106 (54.4)	130 (65.0)	0.64 (0.43-0.96)	0.04
Age of Last Sex partner 31+ yrs	89 (45.6)	70 (35.0)		
My partner is cheating on me	68 (33.8)	24 (12.2)	3.7 (2.19-6.18)	0.00001
No Sign of partner cheating	133 (66.2)	173 (87.8)		

HIV infected persons were 8.2 times more exposed to trans anal sexual intercourse compared to the controls who were only exposed to trans vaginal sexual intercourse [OR=8.2 (95% CI=1.1-365.8)]. The HIV positive persons were also 3.7 times more likely to have a cheating partner as compared to the controls [OR=3.7 (95% CI=2.19-6.18)] Intra anal sexual intercourse and cheating partner were significant associated factors for HIV infection. Having a regular sexual partner, living in the same domicile with a regular sex partner, exposure to a sex partner whose age was less than 31 years old were significantly protective in association with HIV infection.

Table 24 : Risky Socio-Behavioral Attribute Of Respondents

Attributes	Cases N (%)	Controls N (%)	OR (95% CI)	P Value
Had sex play in the Big City	66 (82.5)	43 (58.9)	3.28 (1.57-6.90)	0.0023
No sex in the Big city	14 (17.5)	30 (41.1)		
City Sex was condom protected	10 (15.2)	28 (65.1)	0.096 (0.04-0.24)	0.000001
City Sex not condom protected	56 (84.8)	15 (34.9)		
Suffered Communal conflicts	53 (26.0)	31 (15.2)	1.96 (1.2-3.21)	0.01
No communal conflict	151 (74.0)	173 (84.8)		
Displaced due to conflict	39 (19.1)	23 (11.3)	1.86(1.066-3.25)	0.038
No internal displacement	165 (80.9)	181 (88.7)		
Shared sharp objects	131 (64.2)	75 (36.8)	3.1 (2.06-4.6)	0.000001
Did not share sharps	73 (35.8)	129 (63.2)		

HIV infected persons were 3.3 times more likely to have had sex play while on transit in the big cities compared to the controls who never had sex [OR=3.28 (95% CI=1.57-6.90)] HIV positive respondents had condom-protected intercourse only 4% of the times in the city compared to the control group [OR=0.096 (95% CI=0.04-0.24)] HIV positive persons were 2 times more likely to have suffered communal conflict [OR=1.96 (95% CI=1.2-3.21)] and were also 1.86 times likely to have been internally displaced as a result of the conflict [OR=1.86 995% CI=1.06-3.3)] compared to the control group. HIV positive respondents were 3.1 times more likely to have shared sharp objects compared to the control group [OR=3.1 (95% CI=2.06-4.6)]

Exposure to unprotected sexual intercourse while on transit in the Big Nigerian cities, communal conflict and displacement and sharing of sharp objects were significantly associated with HIV

Table 25: Risky socio-Behavioral Attribute of respondents

Attributes	Cases N (%)	Controls N (%)	OR (95% CI)	P Value
Had blood transfusion	38 (18.6)	9 (4.4)	4.96 (2.33-10.6)	0.000015*
No blood transfusion	166 (81.4)	195 (95.6)		
No knowledge of cause of HIV	87 (42.6)	46 (22.5)	2.54 (1.66- 3.94)	0.00002*
Fully aware of cause of HIV	117 (57.4)	158 (77.5)		
No Knowledge on ways of contracting HIV	29 (14.2)	6 (2.9)	5.44 (2.15-16.4)	0.000056*
Fully aware	175 (85.8)	198 (97.1)		
Knowledge on ways to avoid HIV	60 (29.4)	19 (9.3)	4.04 (2.33-7.22)	0.000005*
Fully aware	144 (70.6)	185 (90.7)		

HIV positive respondents were 5 times more likely to have had a blood transfusion [OR=4.96 (95% CI=2.33-10.6)] and were also 2.6 times more likely to have no knowledge on the cause of HIV [OR=2.54 (95% CI=1.66- 3.94)] as compared to the control group. The HIV infected persons were 5.4 times more ignorant on ways of contracting HIV [OR=5.44 (95% CI= 2.15-16.4)] and were also 4 times more likely to be ignorant on ways of avoiding HIV [OR=4.04 (95% CI=2.33-7.22)] compared to the control group.

Blood transfusion, poor knowledge of HIV cause, and ways of avoiding HIV were significant factors associated with HIV.

Table 26: Stratified Analysis of associated factors for males

Variable	AOR	95% CI	P Value
Having A Polygamous Family Setting	6.9	2.56-18.69	<0.001*
Partner's Job Involves Travelling	4.4	0.52-36.82	0.292
Age At Sex Debut Less Than 16 Years	2.7	1.03- 6.86	0.0561
Multiple Sex Partners More Than 3 In Life Time	14.4	6.49-31.77	<0.001*
Living With Regular Sex Partner	0.5	0.29- 0.92	0.0145*
Alcohol Use Last Sex Act	3.2	1.35-7.72	0.0141*
Smoking Habit	2.7	1.31-5.4	0.0096*
Habitual Use Of Mood Enhancement In Alcohol	2.6	1.25-5.41	0.01*

Having a polygamous family setting, sex partnering with someone whose job involves travelling, sex debuting below 16 years of age, multiple sex partnering (more than 3 partners in lifetime), living in the same house with regular sex partner continuously in the recent 6 months, the use of alcohol, mood enhancers and smoking prior to sex play were all factors significantly associated with risk of HIV infection.

Table 27: Stratified Analysis of associated factors for males: stratified for age and sex

Variable	AOR	95% CI	P Value
Paid/Received money for sex	5.2	2.32-11.9	<0.001
Had STD in Life	7.6	4.0-14.7	<0.001
Out of Hospital Care for Last STI	1.7	0.81- 3.4	0.21
Don't Know if current Sexual Partner has HIV	7.7	3.7-16.2	<0.001
Consistent condom protected sex	0.25	0.14-0.47	<0.001
My partner is cheating on me	4.1	1.52-11.15	0.0078
Shared Sharp object	3.4	1.9-5.96	<0.001
Blood Transfusion and HIV risk	8.0	2.7-24.5	<0.001
Poor Knowledge of HIV cause	1.8	0.97-3.34	0.0879
Ignorance on ways of avoiding HIV	2.6	1.34- 5.00	0.0063

Paying for sex, positive history of contracting STI, and ignorance of current sex partner's HIV status, a relationship with a cheating sex partner, sharing of domestic sharps, blood transfusion and poor knowledge on ways of avoiding HIV were all factors associated with risk of HIV infection.

Consistent condom use was protective factors associated with HIV infection among the male folks.

Table 28: Stratified analysis of HIV associated factors for female (stratified for age and sex)

Variable	AOR	95% CI	P Value
Being divorced/separated	3.3	1.27-8.34	0.018*
Being from a Polygamous family setting	2.8	1.3-6.1	0.013*
Partner's Job involves travelling	21	2.7-169.7	0.0003*
Age at Sex Debut less than 16 years	2.9	1.4-6.0	0.0046*
Multiple Sex partners more than 3 in Life time	16	7.7- 35.2	<0.001*
Living with Partner in the past 6 months	0.47	0.25- 0.88	0.0115*
Alcohol use last Sex Act	7.2	2.7-20.4	<0.001*
Paid/Received money for sex	8.7	2.9-26.5	<0.001*
Non Consensual Sex	4.7	2.1-10.6	0.0002*
Had STI in Life	14.7	6.5-33.1	<0.001*
Out of Hospital Care for Last STI Contracted	4.1	1.6-10.8	0.0047*

Being divorced from a sex partner, belonging to a polygamous family setting, having a partner whose jobs involves travelling, age at sex debut less than 16 years, multiple sex partnering in life, the use of alcohol with sex act, rape, and a positive history of STI with out of hospital care for the STI were all significant factors for HIV among the females after stratifying for age and sex.

HIV infected persons were in 53 % of the times not living together with their sex partner in the most recent 6 month period compared to the controls

Table 29: Stratified analysis of HIV associated factors for female (stratified for age and sex)

Variable	AOR	95% CI	P Value
Don't Know if current Sexual Partner has HIV	13.7	5.7-33.2	<0.001*
Consistent condom use	0.21	0.08-0.47	<0.001*
Having a regular sexual partner	0.22	0.08-0.60	0.001*
My partner is cheating on me	4	2.0-7.75	<0.001*
Ever had Sexual intercourse in the City	4.8	1.4-16.4	0.0231*
City sex protected with a condom	0.06	0.01-0.56	0.0014*
Victim of communal conflict	3.1	1.4-6.8	0.0048*
Shared Sharp objects	2.8	1.5-5.1	0.0482*
Poor Knowledge of HIV cause	3.3	1.6-6.6	0.0014*
Don't know how to avoid HIV	2.3	1.1-4.9	0.036

*Significant factor after stratifying for age and sex

The female HIV infected respondents were 13.7 times more likely to be ignorant of their current sexual partners' HIV status as compared to the controls [OR=13.7 (95% CI= 5.7-33.2)].

Ignorance of current partner's HIV status as a result of non disclosure was a significant associated factor for HIV among the females. The HIV clients used condom inconsistently 89% of the times compared to the control [OR=0.22 (95% CI= 0.08-0.47)]

HIV infected female respondents 88% of the times were exposed to sexual intimacy with a non regular sexual partner compared to the controls [OR=0.21 (95% CI=0.08-0.47)]. HIV positive persons were 4 times more likely to have a cheating sexual partner compared to the control group [OR=5, (95% CI=2.0-7.75)]. The female HIV infected persons in 94% of the times did not insist on using condom for sex protection while on transit to the bigger Nigerian cities compared to the controls [OR=0.6 (95% CI= 0.01-0.56)]. The female HIV clients were 3.1 times more likely to have been victims of communal conflict [OR=3.1 95% CI=1.4-6.8)]. The female HIV clients

were also 2.8 times more likely to have shared domestic sharps compared to the controls [OR=2.8 (95% CI=1.5-5.1)]. The female clients were 3 times more likely to be ignorant of the cause of HIV [OR=3.3 (95% CI=1.6-6.6)] and were 2.3 times more likely to also be ignorant on simple ways of avoiding HIV [OR=2.3 (95% CI=1.1-4.9)] compared to the controls

4.7: Unconditional Regression Modeling of Attributes

Table 30: Unconditional Logistic regression of factors associated with HIV infection: identified attributes in males

Attribute	AOR	95% C.I.	P-Value
Age Group More Than 31 Years	9.9	1.68-58.46	0.0114*
Knowing Partner HIV Status	0.41	0.20-0.83	0.014*
Consistent Condom Use	0.24	0.12-0.47	<0.001*
Used Mood Enhancers	2.58	1.07-6.21	0.0349*
Paid Money For Sex	2.98	1.26-7.05	0.013*
Had STI In Life	7.11	3.60-14.03	<0.001*
Condom Unprotected Sex With Spouse	0.55	0.31-0.99	0.0445*
Condom Unprotected Sex With Fiancee	5.71	2.42-13.48	<0.001*
Living With Sex Partner	0.43	0.20-0.92	0.0294
More Than 3 Sex In 3 Months	2.90	1.30-6.43	0.009*
Divorced/ Separated Or Widowed	3.95	1.21-12.90	0.0228*
Don't Know HIV risks	1.33	0.64-2.74	0.448*
Don't Know How To Avoid HIV	1.97	0.89-4.33	0.0937*

Among the males, awareness of current sex partners' HIV status, consistent condom use, condom unprotected sex partnering with ones' spouse, living in the same house with one's sexual partner in the past six months period were all protective factors against HIV infection.

On the other hand, age (older than 31 years), ignorance of partner's HIV status, the use/ingestion of mood enhancers, having suffered from STI in life, last sex partnering with a fiancée, multiple sex partnering (more than 2) in a the last 3 months, being a widower or separated from sex partner, ignorance of the of HIV risks and simple available ways of avoiding HIV were associated risk factors for HIV infection among the male folks.

Table 31: Unconditional Logistic regression of factors associated with HIV infection: identified risk factors for females

Attribute	AOR	95% C.I.	P-Value
Age of sex debut more than 16 years	0.3	0.13-0.62	0.0013*
Married in a Polygamous family setting	3.0	1.3-6.6	0.0072*
More than 3 Sex partner life time	22.3	9.4-52.5	<0.001*
Alcohol use prior to sex act	10.7	3.0-38.1	0.0003*
Contractual Sex	8.4	2.6-27.1	0.0004*
Ignorance of partner's HIV Status	4.8	2.3-10.2	<0.001*
Having a regular Sex Partner	0.3	0.1-0.83	0.0208*
My Partner is Cheating on me	2.4	1.07-5.52	0.0332*
More than 3 Sex Partner Lifetime	15.0	6.8-33.2	0.0000*
Had sex in the Big City	4.9	1.4-16.7	0.0109
City Sex condom- protected	0.05	0.005-0.50	0.0112*
Last sex Condom un-protected	3.8	1.5-9.6	0.0041*
Consistent condom use	0.07	0.021-0.21	<0.001*
Suffered communal conflict	4.1	1.04-16.2	0.0443*
Shared domestic sharps	2.8	1.5-5.1	0.0013*
Don't know HIV risky behaviors	3.4	1.66-6.96	0.0009*
Don't know how to avoid HIV	2.3844	1.13-5.02	0.0224*

For the females, sexual debut beyond 16 years of age, regular sexual partnering, engaging in condom-protected sex while on transit in the big cities supported by consistent condom use were protective factors against HIV infection.

Polygamous marital settings, exposure to more than 3 sexual partners in life,, the use of alcohol by self or partner prior to intercourse, contractual sex practice, unprotected sexual intercourse especially in the city, ignorance of sex partners' HIV status, relationship with a sex partner whose faithfulness is suspicious, being a victim of communal conflict, sharing of sharps and general ignorance on the risk factors for HIV and simple ways of avoiding HIV were associated risk factors for HIV among the females.

CHAPTER FIVE - DISCUSSION

This study was focused on Benue North East district whose population is 35.6% of the entire Benue State population of 4.5 Million people. The study was multi-centered involving attendees of the entire comprehensive anti-retroviral treatment centers in the study area. Respondents were 204 cases and 204 controls made up of 224 males and 184 females (M: F ratio =1.2:1) with age range of 15-65 years. The study therefore elicited demographic and behavioral characteristic from a subset of the general population and not just from special groups like the pregnant mothers or most at risk groups as has been the focus of previous studies on HIV in Benue State.⁶ This is also one of the few studies in this area in which a case control study design approach is utilized to elicit prevalent risk factors to a scourge that has affected Benue State and stigmatized it as the most prevalent State in HIV/AIDS in Nigeria

Several socio demographic factors were significant with HIV risk of infection, including age, travel history, marital status, number of sex partners, history of sexually transmitted infection (STI) and sex in exchange for gifts or money.

Being a male older than 31 years was significantly associated with the HIV positivity. This study also revealed that trans-generational sex is associated with HIV infection at bivariate analysis. Trans-generational sex partnering is culturally acceptable in this study population wherein older men go sex-coupling with the younger female age cadre; the females thus potentially stand the risk of perpetually being infected by their older male partners. The study by Cockcroft et al⁴⁵ conducted in Botswana, Namibia and Swaziland also gave a similar consensus that intra

generational sex was common place and was often linked to seduction by the females and exchange of goods and materials in return for sex. The findings of this study largely agrees with the study by Hallman²³ in South Africa which established that the burden of new HIV infections in sub Saharan Africa is concentrated among young people, especially females.

Although there was no strong association in the frequency of travels made and HIV infection, this study however found significant association between Job travel history, partner's job travel history and HIV infection. It can be deduced from the findings from this study that for HIV, it is not the frequency of travels that matter but the fact that one travels.

The study also showed a significant association between having intercourse in the city and HIV infection for females. For both gender, having unprotected sexual intercourse while in the big Nigerian cities was strongly associated with HIV infection. The history of having dwelt in the city or even the length of stay in the city was not associated with HIV infection. It is therefore the risky behavior while in the Big Nigerian City that counts in HIV propagation.

Sexual debut at the age below 16 years was significantly associated with HIV among the respondents and this was sustained at multivariate as well as regression analysis in the female gender. Since the older male folks are traditionally inclined to the younger female age grade in this population, this finding further, emphasis the risk of HIV transmission to the female from the male very early in life. Commencing sex at an early age potentially leads to higher number of life time partners making the females potential reservoirs of HIV infection in the community.

In this study having condom-unprotected sexual exposure to 2 or more partners in 3 months or one year, or more than 3 life time partners was significantly associated with HIV infection. Since only 20% of our population is of polygamous household, the larger proportion (80%) are either

single or are in the monogamous family setting. It can be deduced that polygamy is not a sufficient explanation for multiple sex partnering among this study population. The correlation of multiple sex partnering and HIV infection has been observed in several other studies including that by Ghosh in India⁹ and Odimayo in Benue State²⁹

In this study respondents reported a high percentage (46.3%) of condom use in the last sex act compared to 16 % by National survey of 2010.⁴ Inconsistent condom use was, however, also high. There was association between inconsistent condom use and risk of HIV infection for both genders up to the level of regression analysis. Inconsistent sex protection potentially results in sexually transmissible infection and transmission of the HIV. This finding corroborates that of Yalew et al in Ethiopia.¹⁶

In our study, respondents' reasons for inconsistent condom use for sex protection ranged from no satisfaction (34%), ignorance (10.5%) e.g. 'it causes stomach/penile pain', matrimonial reasons e.g. "we want to have children", "she is my wife", to non availability (10.4%) (e.g., 'condom not available', 'felt too shy to buy', 'I was rushing'. These findings largely agree with Longfield and Baker.^{46, 47} Respondents who gave reasons that condom was not available or that it causes stomach pain and does not give satisfaction or that their partners refused/did not want condom were strongly associated with HIV infection. HIV infected partners in 37% of times refused to use condom for reasons of 'we want to have children' compared to the controls. Refusal to use condom for reason of 'we want to have children' was therefore a protective exposure factor to HIV in this study.

A small proportion (1.7%) of the respondent gave a history of having had anal intercourse; intra anal intercourse was found to be associated with HIV risk at bivariate analysis.

Approximately equal proportion of both sexes had reported a history of sexually transmissible infection STI; having had STI in life was significantly associated with HIV infection in males even up to logistic regression analysis. This was not so among the female, probably because a slightly higher proportion (38%) of the female who had STI symptoms accessed hospital based care as opposed to a lower proportion (35 %) of the male respondents. Respondents who had out of hospital based care for their STIs were strongly associated with HIV infection as opposed to those that accessed Hospital based care. This finding is of relevance in intervention approaches to HIV.

Data from this study shows that for the females the current sex partner being HIV positive status was significantly associated with HIV infection at all levels of analysis. This finding is not just in keeping with biologic plausibility but also implies here that the female source of HIV infection appears to be from the male partners especially in this largely heterosexual setting where the main mode of transmission is through sexual intercourse. This finding again agrees with that of Yalew in north west Ethiopia.¹⁶

It is clearly shown from this study that being ignorant of partner's HIV status was significantly associated with the risk of HIV infection in both genders even at logistic regression modeling. In this study, 25% of the respondents did not know their sexual partners' HIV status. This has significant implications on willingness/ acceptability of voluntary testing for HIV as well as disclosure issues in the study area despite previous health promotion activities by government and partners in this district.

From the findings in this study, being separated, widowed, or divorced or estranged from ones partner remained strongly associated with HIV infection among the males but not the females at

logistic regression level of analysis. Given that this group is 11.5% of the study population, it is obvious that this is a group that must not be neglected in terms of control measures. On the other hand living together with a sex partner was seen to be protective against HIV infection in males. Although 99.6 % of the married couples had been living together, a high proportion (47.1%) of the respondents who had regular intimate relationships had not been living together in the past 6 months. It appears that the bonding in marriage and the simple act of living together with ones partner is largely protective to the males from getting exposed to extramarital relationship. This finding is probably at variance with that by smith¹⁷ and Cornwall.²⁰

Although 20.6% of the male and 16.8% of the female respondents had exchanged money or goods for sex, transactional sex was found to be significantly associated with HIV infection even at logistic regression for the females and not the males. This is probably because the females were largely at the receiving end than the males. Being at the receiving end of the economic table often compromises one's ability for negotiating the use of condom for sex protection as suggested by Hallman in his study in South Africa.²³

The respondents in this study were high users of tobacco 40(9.8%), high consumers of alcohol 62(15.2%) and high users of mood enhancer 50(12.3%). The prevalence of use of mood enhancers in alcoholic drinks in our study is low compared to the recent survey report by J. Kponee et al where the consumption of caffeinated alcoholic beverages(CAB) was found to be as high as 52% among the youth he studied.⁴⁸ Notwithstanding, the prevalence is significant in our study setting in view of the high HIV burden. Tramadol, Codeine and Valium which were the most abused substances used in various dosages in alcoholic drinks and mineral drinks 'slows' the abuser -eliciting a tranquil state devoid of rational thought. The abusers call the process of taking these mixtures "slowing"; they therefore invite their peers 'you dey game to

slow?’ and a ready consumer would reply, ‘I dey game’. Understanding of the language used and behavior is important in packaging HIV intervention for this group.

In this study population, there was high knowledge (88.1%) on the various routes of transmission of HIV and also high knowledge (90%) on the common available means of avoiding HIV. This is at variance with the National sero-prevalence Survey⁴ findings which were 54% and 52.5% respectively. This study also found that ignorance of the cause of HIV and simple preventive measure were all significant factors for HIV positivity in both sexes at various levels of analysis.

CHAPTER SIX-CONCLUSIONs & RECOMMENDATIONS

6.1 Conclusions

The study found that sex debut at age less than 16 years, marital separation and multiple sex-partnering were significant *demographic factors* for HIV in the study population.

It was also found that previous STI, unprotected sexual exposure to multiple sex partners, the use of alcohol and mood enhancers in alcoholic drinks prior to sex act, sharing of domestic and hair making sharps were significant *risky behaviors* to HIV.

The significant *social risk factors* associated with HIV in this study population were displacement during communal conflict, exposure to transactional unprotected sexual intercourse while on transit in the big Nigerian cities and ignorance of the common preventive measure for HIV.

6.2 Recommendations

1. Benue State Government through the State HIV/AIDS Control Program (SACP) in collaboration with the State Agency for Control of HIV/AIDS (BenSACA) should design youth specific targeted risk prevention program specifically addressing condom acceptance and usage.
2. The SACP in collaboration with BenSACA and National drug Law Enforcement Agents (NDLEA) should design and execute awareness creation programs discouraging the abuse of alcohol and the use of mood enhancing agents such as Tramadol, Codeine, and Valium in alcoholic drinks ('Slowing agent') focusing especially among the youths.

3. Government at all levels in collaboration with the private sector, and other Stakeholders should initiate youth empowerment programs such as Peer Education Program (PEP) to boost self esteem among the youth, vocational trainings to promote income generating activities in the community so as to reduce unemployment and poverty.
4. BenSACA should ensure a State legislation on the use of mood enhancers and other restricted drugs without prescription.
5. The SAPC and BenSACA should continue to support and promote counseling and early testing through the provision of Mobile HCT Services on a large scale through the State.
6. Benue State Government through SAPC and BenSACA , other Implementing partners, NGOs and other stakeholders should continue to promote Behavioral Change Communication (BCC) using entertainment, education and other Information Education and Communication (IEC) materials to create more awareness and knowledge on HIV/AIDS in the State.
7. Benue State Government should provide the needed peace and security measures to arrest communal conflicts in the State.

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APPENDIX 1

QUESTIONNAIRE

Department of Community Medicine, Faculty of Medicine, Ahmadu Bello University Zaria, Kaduna State.

Greetings Sir/ Madam.....

My name is _____, and I work for _____
LGA/Benue State Ministry of Health. I am part of a team doing a research to determine the risk factors
for contracting HIV in Zone A Senatorial District of Benue State. We plan to use the study findings to
recommend interventions that will accelerate the control of HIV/AIDS and also sustain appropriate
support for people living with HIV/AIDS in the country. All data will be handled with strict
confidentiality. Thank you.

Instructions: Please fill in the blanks or check(tick) [] the appropriate check
boxes where applicable

LGA Code ----- Questionnaire Number _____ Health facility _____

Case [] Control [] Interview Date _____

Section A. Socio-Demographic Characteristics of Respondents

1. How old are you(years):__ __ Male[] Female []
2. What is your religion: Christian [] Islam []
3. If you are a Christian, what church do you attend? Catholic[] NKST[] Aglican [] Methodist [] Pentecostal [] Others(Please Specify) _____
4. What is your tribe: Tiv[] Idoma [] Igede [] Jukun[] Etilo [] Hausa [] Yoruba [] Igbo [] Others(please specify) _____
5. What is your occupation: Housewife [] Employed for wage [] Farming [] Business/Trading []
6. Does your present Job/trading involve traveling ? Yes [] No []
7. If yes specify how often do you travel? _____ weekly _____
monthly.
8. Where do you often travel to _____
9. Does your partner's Job also involve travelling Yes [] No []

10. If yes where does he/she you often travel to _____
11. What is the highest level of education you attained?: None [] Primary [] Secondary []
Tertiary [] Quranic []
12. What is your marital status: Single [] Married [] Divorced/ Separated [] Widowed []
Co-habiting []
13. If married, are you and your spouse currently living in the same town? Yes [] No []
14. If divorced, where you living together when you were married? Yes [] No []
15. Family setting: Monogamous [] Polygamous []
16. Are you a Current Smoker of cigarette/snuff Yes [] No []
17. Used to smoke cigarette/snuff but stopped Yes [] No []
18. Never smoked cigarette/snuffed in my life Yes [] No []
19. Are you a Current drinker of alcohol Yes [] No []
20. Used to drink alcohol but stopped Yes [] No []
21. Never drank alcohol in my life Yes [] No []
22. Are you using any mood enhancement drugs? Yes [] No []
23. if Yes please indicate name of drug _____

Section B-Risk Factor Sexual Behavior (for both Cases and Controls)

1. How old were you when you first had sex ___ years
2. Where did you meet the person with whom you had sex for the first time in your life?(what occasion?)
 - Social party Yes [] No []
 - Burial ceremony Ye [] No []
 - Traditional festival (e.g. Kwaghir drama show) Yes [] No []
 - In school Yes [] No []
 - In the neighborhood Yes [] No []
 - Other (please specify)_____
3. Have you had a sexually transmitted infection in your life? Yes [] No []
4. If yes, How many times did you contract STI?_____
5. When last did you contract STIs? _____weeks, _____months _____years (please circle one that apply)
6. What did you do to treat the infection? Visited chemist shop? [] Visited Hospital? [] Self treatment? []
Others (Please specify)_____

7. Did you complete the course of prescribed drugs? Yes No
8. If no, why? _____
9. Does your current sexual partner have HIV? Yes No don't know
10. How many sexual partners have you had in the past 3 months? Number _____
11. How many sexual partners have you had in the past 1 year? Number of partners _____
12. How many sexual partners have you had in your lifetime? (Please tick one that applies)
 Less than three (3) partners Three (3) or more partners
13. What was your relationship to the last person you had sex with? (please tick one that apply)
 1. Husband/Wife/ co-habiting partner 2. Fiancee/lover 3. Friend 4. Occasional partner
 5 Just met/stranger 6 Prostitute 7 Family member/relative 8, Other (Please specify
 _____ 9 Refused to comment
14. Did you give or receive money or goods in exchange for sex?
 Yes No Don't remember No response
15. If yes, how often Did you give or receive money or goods in exchange for sex
 Only the last time All the time
16. Did you or your partner use a condom the last time you had sex? Yes No Don't know
17. Do you use a condom every time you have sex? Yes No Don't know
18. If _____ no,
 why? _____
19. Have you ever had anal sex with your partner Yes No No comment
20. Had you or your partner taken alcohol the last time you had sex?
 21. Yes No Don't know
22. Do you have a regular sexual partner? (Regular partner is meant someone you had sex with more
 than 3 times in the past year) Yes No **{If no, skip to question 26}**
23. Have you been living together (with your regular partner) in the past 6 months?
 Yes No
24. How old is your regular sexual partner? ___ (years)
25. Do you suspect that your regular partner is having a sexual relationship with
 Somebody else? Yes No Don't know

Please note that question 26 & 27 is for women only

Sometimes women are forced to have sex and end up getting Sexually Transmissible Infections including HIV.

26. (*For females only*) Were you forced to have sex in the past?
Yes No I don't remember Refused to answer
27. If yes, who forced you? Fiancée/Boy friend , Blood Relations Stranger ,
Other (please specify) _____
28. Which is your usual area of residence? Town _____
LGA _____, State _____
29. How long have you been living in this place for? _____(years) _____(months)
30. Have you ever resided in any big city in Nigeria Yes No if no please skip to 38
31. If yes what is the name of the city _____
32. how long did you stay there _____ (years) _____ (months)
33. What was the purpose of coming to the city? _____
34. Have you ever had sex in that city? Yes No
35. What was the reason of having the sex? _____

36. Was the sex protected with a condom? Yes No
37. When did you return from the city _____(years) _____ months
38. Has your community suffered any communal conflict? Yes No
39. Were you or any member of your family displaced? Yes No .
40. If yes who did you or they stay with _____
41. Have you ever shared the use of any sharp object with others around you (Needles, Razors, shaver etc.)
Yes No if yes specify type of sharp _____
42. Have you ever been transfused with blood? Yes No
43. If yes, When where you transfused? _____ (years ago) _____ (months ago)
44. In your own opinion what causes HIV?
1. _____
2. _____
3. _____
45. What are the ways in which someone can get HIV?
1. _____
2. _____
3. _____

46. How can one avoid contracting HIV?

1. _____
2. _____
3. _____

Thank you very much for your response. God bless you.

APPENDIX 2

INTERVIEW PROTOCOL

RISK FACTORS FOR HIV/AIDS AMONG PATIENTS ATTENDING ART CENTERS IN ZONE A SENATORIAL DISTRICT OF BENUE STATE, NORTH CENTRAL NIGERIA.

Name of interviewer: _____

Date of interview: (dd/mm/yy) _____

This questionnaire was conducted at:

Health Facility: _____

LGA: _____

Interviewee (Questionnaire) Number _____

Indicate if Case [] or Control []

Interviewee Sex: Male [] Female []

Interviewee Signature: _____

Research Protocol

RISK FACTORS FOR HIV/AIDS AMONG PATIENTS ATTENDING ART CENTERS IN ZONE A SENATORIAL DISTRICT OF BENUE STATE, NORTH CENTRAL NIGERIA.

BACKGROUND

This study hopes to establish prevailing risk factors for HIV transmission in the Benue community and provide evidence based recommendations which will guide pragmatic steps that will peg the HIV epidemic and possibly begin to reverse the impact of HIV from Benue State and Nigeria at large.

GUIDANCE FOR INTERVIEWING:

1. Prior to the interview, the explicit consent of the interviewee must be obtained in writing or verbally on the understanding that all information provided is confidential, anonymous and non-attributable. Consent and information sheets MUST be signed before the beginning of interviews.
2. Interpreters must be educated about the ethics of the interviews
3. Optional prompts and follow-up questions should be encouraged in an open interview format
4. All responses should be recorded in writing after consent is obtained

INTRODUCTION

Greetings: Sir/ Madam

We thank you for this unique opportunity to interview you on issues concerning the risk factors for contracting HIV in Benue State. My name is _____, and I work for _____ LGA/Benue State Ministry of Health. I am part of a team doing a research to determine the risk factors for acquiring HIV/AIDS in Zone A Senatorial District of Benue State. We plan to use the evidence based on our findings to recommend strategies that will improve the control of HIV/AIDS epidemic in the state as well as sustain appropriate support for people living with HIV/AIDS.

PURPOSE OF THE RESEARCH:

We are planning to carry out a study to determine the risk factors for acquiring HIV/AIDS in Zone A Senatorial District of Benue State. We would therefore like to find out from you what you know about yourself. We plan to use this study to improve the control of HIV/AIDS epidemic in the state as well as sustain appropriate support for people living with HIV/AIDS.

PROCEDURES: To find answers to some of these questions, we invite you to participate in an interview. You have been randomly selected to participate in this interview. If you accept, you will be asked some questions concerning several aspects of your life; some of which may be very personal and perhaps appear embarrassing to you. We will ask you to answer these questions.

I will record your answers to these questions on this form (questionnaire/ interview guide). This is done so that I may remember everything that you have told me. Although it is important for the research that you answer all the questions, if you do not wish to answer any of the questions included in the questionnaire, you may ask to move on to the next question or even completely discontinue. Your honest answers to our questions and opinions will enable us identify the risk factors for contracting HIV in Benue State and ultimately will help draw up interventions that will halt this epidemic.

The information recorded is confidential, and no one else except the study coordinators are privy to it. The expected duration of the interview is about 20 minutes.

RISKS AND DISCOMFORTS: There is a slight risk that you may feel uncomfortable talking about some of the topics. However, we do not wish this to happen, and you may refuse to answer any question or not take part in a portion of the interview if you feel the question(s) makes you uncomfortable.

BENEFITS: There will be no direct benefit to you but the information obtained from this study will help to provide suggestions that will enable the Government and other stakeholders improve their services and offer appropriate for you and others. If you have any special health concerns you will be referred to where you can receive help.

INCENTIVES: We will not give any incentive for taking part in the research. However, you may receive one-on-one information on HIV/AIDS from your interviewer.

COSTS OF PARTICIPATION:

Your participation in this research will not cost you anything beyond the time you spend answering questions

CONFIDENTIALITY:

We have taken the following steps to ensure that you are safe and that the information you provide is confidential.

1. The interview will take place in a private place, where no one else hears what you discuss with the interviewer.
2. The information that we collect from this research project will be kept confidential.
3. Information collected from you will be stored in a file that will not have your name on it, but a number assigned to it instead.
4. The name associated with the number assigned to each file will be kept securely and no one other than those of us in the study team will have access to it.
5. You may talk to the leader of the project in case you have any concern or questions.
6. The questionnaires will be destroyed after the research is completed.

RIGHT TO REFUSE OR WITHDRAW: You do not have to take part in this research if you do not wish to do so, and refusing to participate will not affect your future care. Even if you do not wish to answer these questions you may still benefit from the ongoing projects. You may stop participating in the interview at any time that you wish, and there will be no negative consequences for you in any way.

AFTER THE STUDY: During and after the research study, interim and final reports will be made available through the ART Clinics in your community. Printed summaries of results will be made available at each participating Hospital

CONFLICT OF INTEREST: None of the researchers have any commercial interest in this study. We are not aware of any other information that may cause the researchers to do their work with fear or favor.

GIVING US YOUR CONSENT TO PROCEED: We want you take a few moments to go through the informed consent form and give us your verbal and written consent to proceed with this interview.

(Instruction: provide the respondent with the form, have them read and sign it.)

Thank you once again for your time

STATEMENT OF PERSON OBTAINING INFORMED CONSENT

I have fully explained this research to _____ and have given sufficient information, including information about risks and benefits, to make an informed decision.

DATE: _____ SIGNATURE: _____

NAME: _____

STATEMENT OF PERSON GIVING CONSENT

I have read the description of the research or have had it translated into a language I understand. I have also talked it over with the interviewer to my satisfaction. I understand that my participation is voluntary. I know enough about the purpose, methods, risks and benefits of the research study to judge that I want to take part in it. I understand that I may freely stop being part of this study at any time. I have received a copy of this consent form to keep for myself.

DATE: _____ SIGNATURE: _____

Patient’s Name

WITNESS’ SIGNATURE (if applicable): _____

WITNESS’ Signature (if applicable): _____

WHO TO CONTACT: If you have any questions you may ask them now or later. If you wish to ask questions later, you may contact: **Dr. Igbabul Shember-Agela Address: Nigeria Field Epidemiology and Laboratory Training Program, #50, Haile Sellasie Str. Asokoro, Abuja Tel: +2348026392413 Email: igbabulsa@gmail.com**

TIV TRANSLATION OF STATEMENT OF PERSON GIVING CONSENT

ISHIEDA INAN HEN MPIN

I pasem hamma kwagh u mtov I ilu zan amin sha kwagh u angev mbu Ornakande ne. Mkav mfe vindi vindi sha hanma kwagh u I orom chii. Naham M na Mbatverev I an gbangesaa me I pinem hanma mpin chii. Mfa dedoo me mpin ne ka u sha igosoo ga. Nahan msoo u lun mon u nan iwanger sha hanma mpin chii. Man shi mer shieda higen

Sign _____ Iyange _____

Iti Yam _____ Signature I Orshienda _____ Iyange _____

APPENDIX 3



Ahmadu Bello University Teaching Hospital

P.M.B. 06, Shika - Zaria, Kaduna State, Nigeria. 069-876305

website: www.abuth.org abuthshika@yahoo.com Abuthshika@gmail.com

Chairman of Board:

Chief Medical Director: DR. LAWAL KHALID, MBBS, FMCS, FWACS, FRCS(ED) mni

Chairman, Medical Advisory Committee: DR. ABDULLAHI MOHAMMED, MBBS, FWACP FICS

Director of Administration: BARR. ISHAK BELLO, LL.B, BL, LL.M, PGDM, AHAN, FCAI

Our Ref:

ABUTH/HREC/TRG/36

26th March, 2013

Dr. Igbabul, Shember-Angela,
Community Medicine,
ABUTH Zaria

ETHICAL CLEARANCE.

Your application for ethical clearance on the research proposal titled: - "Risk factors for HIV/AIDS among patients attending Anti Retroviral Treatment Centre in Zone A senatorial District of Benue State North central Nigeria." refers.

This is to convey ethical approval for you to commence the study. The ABUTH Scientific and Health Research Committee require an annual update from the Principal Investigator.

Thank you.


PROF. J.U OKPAPI
CHAIRMAN, ABUTH HREC

APPENDIX 4

GOVERNMENT OF BENUE STATE OF NIGERIA

Telephone: 044-533528, 531604
Telegram: COMMHEALTH



*In replying please quote the number
and date of this letter*

Ref No: 24/9/2012

Ministry of Health & Human
Services

P.M.B. 102093
Makurdi, Benue State

Date: _____

MED/26/320

Dr. Igbabul Shember-Agela
State Epidemiology Unit,
Ministry of Health,
Makurdi.

NOTIFICATION OF APPROVAL TO CONDUCT A RESEARCH TO IDENTIFY RISK FACTORS FOR HIV INFECTION AMONG PATIENTS ATTENDING ANTI RETROVIRAL TREATMENT CENTERS IN ZONE A OF BENUE STATE

Reference to your letter dated 24th September, 2012 requesting for approval to conduct research to identify risk factors for HIV infection among patients attending Anti Retroviral Treatment Centres in zone A of Benue State.

I have been directed by the ethical committee on Health and Health services Ministry of Health Makurdi to grant you approval to conduct the above mentioned study.

You are however advised to note the following ethical issues:

1. The political/Social background of the community you are entering.
2. You would be expected to properly explain the purpose of the study to your subject in order to avoid high expectation from them.
3. Respect to religious sentiments.
4. You are also expected to make available one hard copy of your report including appropriate recommendation to the ethical committee as soon as the exercise is completed please.


Mrs. S. Kyaagba
Director Health Planning

APPENDIX 5-STUDY AREA



Figure 1: Map of Nigeria Showing Benue State Colored in red

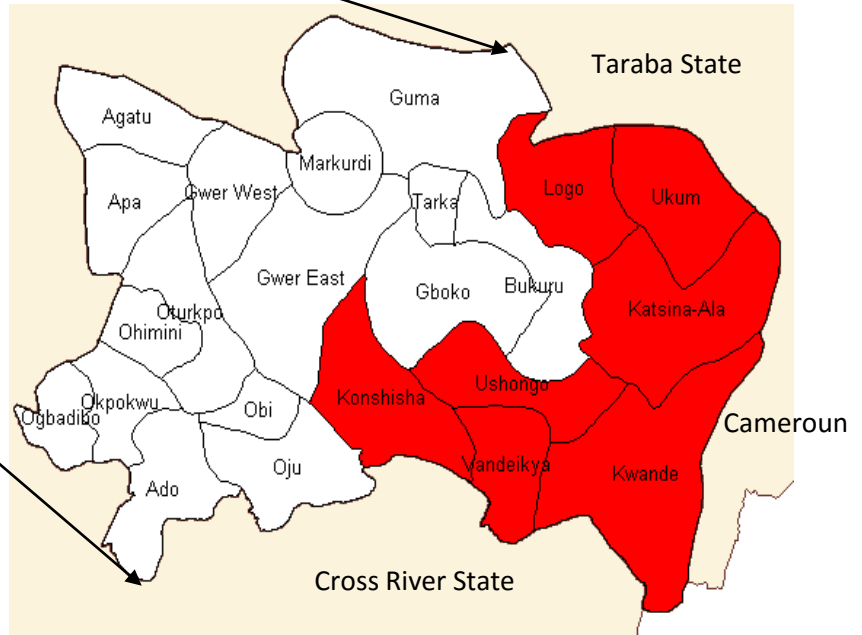


Figure 2: Map of Study Area Showing Benue North East District