2023

Gender-Based HIV Epidemic, Care Retention, and Medication Adherence in South-South Nigeria

INIOBONG U. AKAI
Walden University

Walden University

College of Health Sciences and Public Policy

This is to certify that the doctoral dissertation by

Iniobong Udoffort Akai

has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

Review Committee
Dr. Peter Anderson, Committee Chairperson, Public Health Faculty
Dr. Divine Chiangeh, Committee Member, Public Health Faculty
Dr. Naoyo Mori, University Reviewer, Public Health Faculty

Chief Academic Officer and Provost
Sue Subocz, Ph.D.

Walden University
2023

Abstract

Gender-Based HIV Epidemic, Care Retention, and Medication Adherence in South-South Nigeria

by

Iniobong Udoffort Akai

MSN/MBA/HCM, University of Phoenix, AZ, 2007

B.Sc. (Public Health Nursing), University of Nigeria, Nsukka, 1998

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Health

Walden University

May 2023

Abstract

Women 15-24 years of age globally have a 60% higher rate of human immunodeficiency virus (HIV) infection than men and account for over half of the population of people living with HIV worldwide. In Akwa Ibom State (AKS), Nigeria, more women than men are infected and living with HIV despite being the minority. The socioecological model and HIV treatment cascade framework formed the theoretical foundation for the study. The purpose of the study was to explore the impact of gender on the drivers of the HIV epidemic in AKS using data from the AKS AIDS Indicator Survey. I examined the association between gender and linkage to care (LC), medication adherence (MA), and care retention (CR) with sociodemographic characteristics (location, age, education, marital status, employment, occupation, ethnic group), HIV knowledge, and attitude to HIV as moderators. Bivariate logistic regression analysis results showed that gender had no statistically significant effect on LC, MA, or CR. However, respondents who resided in urban areas were 5 times more likely to be linked to HIV care than rural residents, and respondents with a positive attitude were four times more likely to be retained in care than those with negative attitude. Implications for positive social change include closing the gap in HIV care strategies in AKS. Understanding more about LC, CR, and MA can help provide evidence-based information to HIV care providers and policymakers in AKS on the delivery of individualized HIV preventive measures. Such a delivery method could help reduce the burden of HIV and improve the lives of individuals, families, and communities.

Gender-Based HIV Epidemic, Care Retention, and Medication Adherence in South-South Nigeria

by

Iniobong Udoffort Akai

MSN/MBA/HCM, University of Phoenix, AZ, 2007

B.Sc. (Public Health Nursing), University of Nigeria, Nsukka, 1998

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Health

Walden University

May 2023

Dedication

To my late father, Xavier-UdoOkon Akai Abasiubong Akwaowo Ediene UdoAbia, and my dearest mother, Roseline Xavier Akai (Nwa Etok Iban Idib or Nwa Ekwere Udofford Akpaidem), as a fulfillment of their dreams.

To my beloved wife, Lady Elizabeth Iniobong Akai (ImaUdo), and my wonderful kids (my consultants) – EseAbasi- Gabriel (Ese), IniMfon-Augustus, and EnoEmem Marcellus.

Acknowledgments

There is nothing that God cannot do, and I cannot repay Him enough for all His goodness. I wish to acknowledge the sacrifices of everyone who had been a part of this incredible story - the culmination of years of my pursuit of academic advancement. My gratitude and appreciation first to my parents, late Xavier-UdoOkon Akai Abasiubong Akwaowo Ediene UdoAbia and Madam Roseline Xavier Akai (Nwa Etok Iban Idib), who prepared the grounds, planted the seed, and tendered it with love. Within their means, they toiled under harsh economic and domestic conditions to provide me with the best education though they had no such opportunities. The road to self-actualization was laced and paved with their sweats and pains. I thank my family - wife, Lady Elizabeth, and incredible kids -EseAbasi, IniMfon, and EnoEmem for their endurance, perseverance, and unwavering support during those grueling years. The kids were always ready to help and invest their talents. They are the solid rock on which I firmly stand.

I thank my extraordinary committee chair, Prof Peter B. Anderson, who picked up the task from scratch after I had wasted valuable/precious time/resources with previously assigned supervisors. I appreciate Dr. Divine Mboh Chiangeh (the second member) for his patience and consistency throughout this journey and my URR Dr. Naoyo Mori for the review. I am grateful to the PLoS ONE team of Hanna Abdallah, Matthew-David Ogbechie, Hadiza Khamofu, Sanmi Adedokun, Kwasi Torpey, and to Titilope Badru of FHI360, who together made available the dataset from the Akwa Ibom Aids Indicator Survey for this study.

Though gone from my sight, my late siblings Sylvester-Absiubong Udoffort Akai, Francis-Anietie Xavier Akai, and Assumpta-Imeanwan Akai are remembered for their respective roles during my journey toward self-actualization. My cousins - the late Kingsley Akpan, Ubong Akai, Pepertua Noah, Idara Inyang and husband Ita, and Maria (Unwa Mma), deserve mentioning. I thank my in-laws – Iwok Iwok, Japhet, Ofon, and their families.

I acknowledge the support of my good friends - Uwem Essien and his dear wife Idara, Dr. Imelda Nkoyo (statistician and data analyst), Margaret Bassey, Deaconess Eno Udo-Aka, Fabian Udoh, Dr. Veronica Archibong, Malachy Ekwere and wife Ofon (my mom), Attny. Okon Udondom, Mr. Ita James and Dr. Itawan James, Chief Nkodo Akpaninyang, Pst. Friday Udofia, Brownson (Owo Ekid), Mma Etubom Florence Ema, Mboutidem Nkop, Augustina Aina, Augusta Etukudo, Akparawa Tim Umoette, Godwin Udoh (Iboro), Edieke Davis, Francis Edem, Chris Afangideh, Alex Eton, Peter Etuk (Ete Ufok), Kester Egwuanumku, Imaobong Udoabba, Emmanuel Udoh, Emman Ibiok, Eme Thompson, Comrade Godwin Mfon, Inemesit Inyang (Nsiky), Engr. Essien, Victor Adejor, Vincent Inyang, Mary Akamnonu, Patience Ozurumba, Felicitas Inwek, Emilia W. Akpan, Ekaete Adiaha Udofia, Itohowo Gershom, Emman Ibiok, Monday Akpan, Eka Morgan, Late Abasekong Ekong, Chris Ufford, Idong S. Akpan, and the CFRC at CENSON (David, Sebastian, and Inieke).

A special thanks to Col. Rachelle Paul-Kagiri, Lt. Col. (S) Leslie Balcazar, Maj Uko Obot and wife Helen, and Maj Chheun. Also my humblest gratitude to these amazing families – Lt. Cols. Lee and Richelle Demotica, Rtd. Maj. Eric and Mrs. Andrea

Cuebas, (C)MSgt Elena Langley, Lt. Col. Christopher and Mrs. Kristi Duffett, and Rtd. Maj. Jasse and Rtd. SMSgt. Kallie Beinhower - I cannot forget the love you showered on my family and me. There are so many individuals that I have interacted with in the course of this journey, and I appreciate you because together, you made this journey an exciting experience for me. Our friendship forever shall last.

Table of Contents

List of Tables

List of Figures

Chapter 1: Introduction to the Study

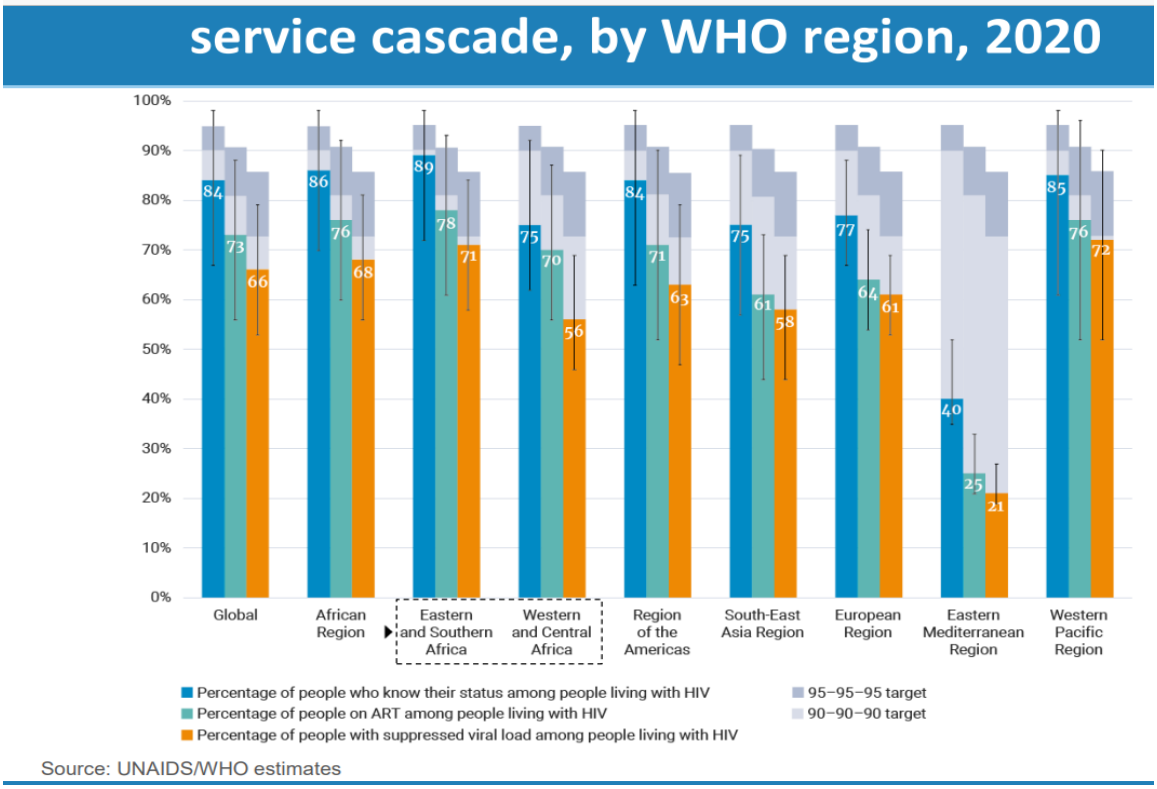
The human immunodeficiency virus (HIV), which is responsible for acquired immunodeficiency syndrome (AIDS), is a complex disease that affects different facets of life (social, economic, physical, emotional, and spiritual; Chinyandura et al., 2022). The complexity of HIV makes linkage to care (LC), medication adherence (MA), and care retention (CR) challenging goals to achieve. Since the discovery and reporting of AIDS in 1981, the disease has become one of humanity's deadliest and most persistent epidemics (National Institute for Allergy and Infectious Disease [NIAID], 2020). HIV is transmitted through sexual intercourse, by sharing syringes, prenatally (during pregnancy), during childbirth and breastfeeding (NIAID, 2020). The disease destroys the CD4 (a type of white blood cell and an integral part of the immune system, also known as helper T cells or T cells), which plays a role in fighting off infections necessary to keep the body from sickness (Centers for Disease Control and Prevention [CDC], n.d.). The destruction of CD4 by HIV (due to failure of LC which is necessary for the initiation of treatment with antiretroviral medications or antiretroviral therapy [ART], failure to adhere to medication regimen, and inability to retain in care) makes HIV infection untreatable, leading to life-threatening infections and complications (NIAID, 2020). LC, adherence to medication (ATM) regimen or MA, and retention in care (RIC) or CR are necessary pathways for reaching viral load suppression (VLS).

About 1.5 million people worldwide (M = 640,000; F= 660,000), according to The Joint United Nations Programme on HIV/AIDS (UNAIDS, 2022a), were newly infected with HIV in 2020. In 2020, about 37,700,000 people (M = 16.7 million; F = 19.3

million) worldwide were living with HIV, with 680, 000 deaths (M= 340,000; F= 240,000) from causes related to HIV infections. Worldwide, about 28 million (73%) of the over 38 million people living with HIV (PLHIV) were on life-saving ART (UNAIDS, 2022a) for the same year 2020 (WHO, 2021; See Figure 1).

Figure 1

Service Cascade by Regions



From UNAIDS/WHO Estimates in Latest HIV Estimates and Updates on HIV Policies Uptake, December 2021, by from World Health Organization, 2021, (https://cdn.who.int/media/docs/default-source/hq-hiv-hepatitis-and-stis-library/2021_global_summary_web_v32.pdf?sfvrsn=4b8815ad_37

Eighty-four percent knew their viral status for the same year, and 66% had an undetectable viral load (Ngaya et al., 2021). In the same year, more than 10 million PLHIV did not have access to life-saving ART, which could potentially fuel HIV spread and further the development of new HIV variants (UNAIDS, 2022a), Over 76 million people had been infected and tens of millions of deaths associated with AIDS-related infections since its discovery (World Health Organization [WHO], 2022b).

In 2018, Nigeria had the second-largest HIV epidemic in the world and one of the highest rates of new infection in sub-Saharan Africa according to UNAIDS's data (Avert, 2020a). As at 2019, over 1.9 million people in Nigeria were infected with the virus (Avert, 2020a). Data extracted in 2020 indicated that over 1.7 million people in Nigeria were living with HIV (960,000 women, 650,000 men, and 130,000 children up to 14 years; Statista, 2022). The high diversity of the virus compounds the management of the disease within the country, making HIV diagnosis, viral load determination, drug resistance testing, and HIV vaccine development a challenge especially in a resource-limited environment such as Nigeria (Oluniyi et al., 2022).

In order to address this burden and contain the heavy toll exerted on the country by HIV infection, the federal government of Nigeria (FGN) inaugurated the National HIV/AIDS Strategic Framework and Plan (NSF) 2017-2021 (FGN, 2017). The NSF aimed to ensure an AIDS-free Nigeria, with zero new infections, zero AIDS-related discrimination and stigma, and a broad goal of fast-tracking the national response towards ending AIDS in Nigeria by 2030 (FGN, 2017). HIV prevention among general and key populations, testing, treatment, care and support, and elimination of transmission

from mother to child are also what the NSF intends to address (FGN, 2017). In line with the desire to actualize NSF's vision and goal, in November 2020 the HIV Trust Fund (HTFN) was launched by the FGN to improve the provision of high-IMPACT HIV interventions necessary to facilitate the requisite treatment for HIV-positive mothers (Ozoemene, 2021; Vanguard Media Limited [VML], 2022).

According to VML (2022), by incorporating private sector competencies and capital market tools through the HTFN, the U$108 million funding gap in HIV preventive measures and treatment in Nigeria could be closed. HTFN is expected to accelerate Nigeria towards the UNAIDS' 95-95-95 goal necessary for ending the AIDS epidemic by 2030 (VML, 2022). The 95-95-95 goal involves diagnosing 95% of all PLHIV, ensuring that 95% of everyone diagnosed with HIV is on ART, and that 95% of PLHIV who are on ART attain viral suppression (VS; VML, 2022).

LC, MA, and CR are crucial and indispensable components of HIV care, and are necessary for reaching the clinical goal of VS (Avert, 2021a). Lam and Presco (2015) asserted that increasing the effectiveness of adherence interventions may have a far more significant impact on the wellbeing of the population than any improvement in specific medical treatment. MA can lead to a long and healthy life by reducing the virus to an undetectable level in the blood which defines treatment success according to WHO ART Drug Use Guidelines (NIAAID, 2020).

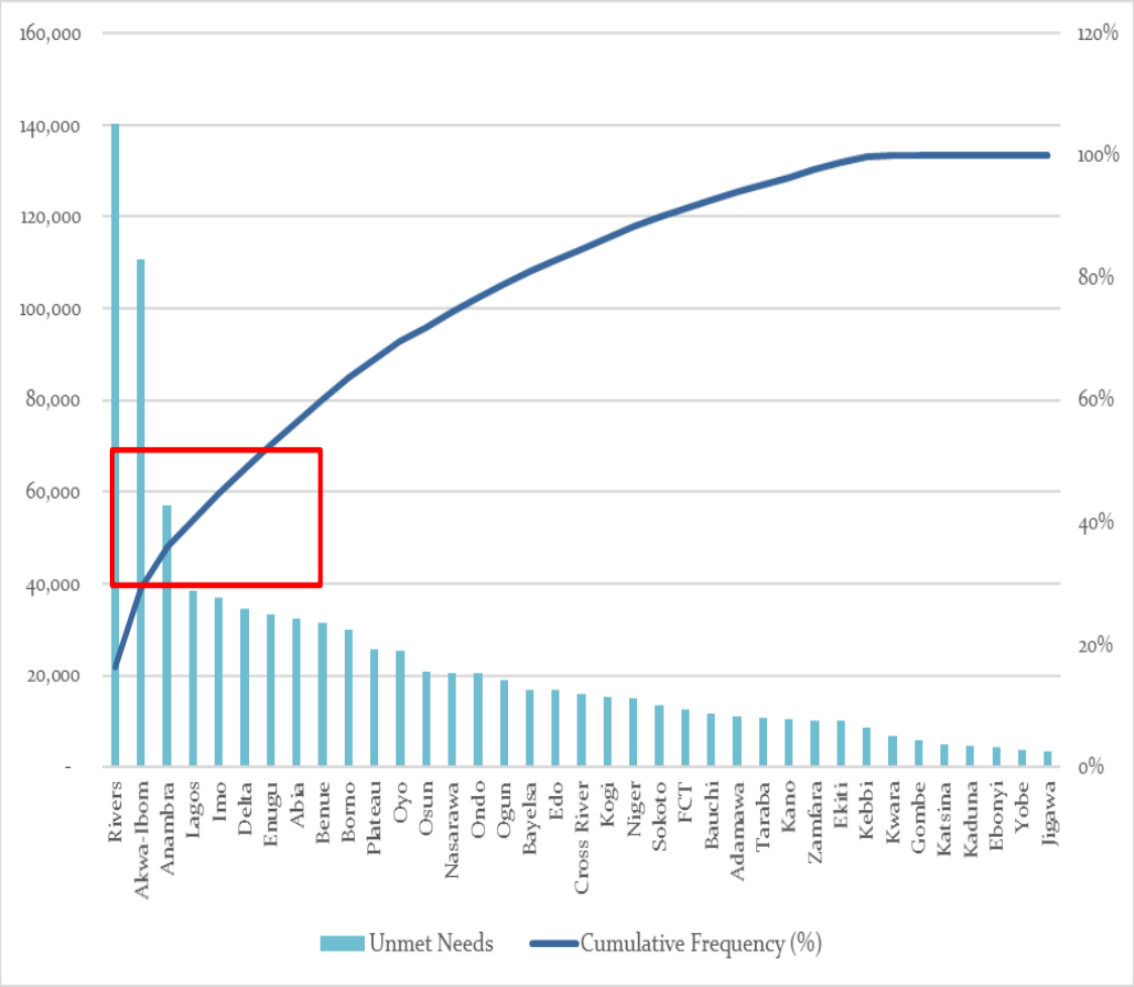
An undetectable viral load is the recommended measure of ART efficacy, indicating treatment adherence and a reduced risk of HIV transmission from PLHIV (UNAIDS, 2022b). ART treatment success is a viral load threshold of <1000 copies/mL

documented in the medical or laboratory records/laboratory information systems within the past 12 months (UNAIDS, 2022b; US President's Emergency Plan for AIDS Relief [USPEFAR], 2019; WHO, 2022a). PLHIV with a viral load test result below the threshold is considered a suppressed viral load (UNAIDS, 2022b). PLHIV with an undetectable viral load cannot sexually transmit the virus, a concept known as Undetectable=Untransmittable, or U=U (NIAIDS, 2020). Various proven methods are available to prevent HIV transmission to HIV-negative people, such as pre-exposure prophylaxis, post-exposure prophylaxis, and voluntary adult male circumcision (NIAIDS, 2020).

The Nigeria 36 states and the federal capital territory are geographically prioritized based on unmet treatment needs (UTN) and treatment coverage into four categories using the results from the 2018 Nigeria AIDS Indicator and Impact Survey (NAIIS): Surge States, Red States, Green States, and Yellow States (USPEFAR, 2020). The Surge States have Akwa Ibom State (AKS) and Rivers which account for 30% of UTN; the Red States with low saturation (LS) and high unmet needs are Delta, Enugu, Anambra, Imo, and Lagos; the Green States with high saturation and low unmet needs (LUN) are Benue, Nasarawa, and Gombe; and the remaining 25 States are Yellow States with LS and LUN (See Figure 2). The Surge States, located in the South-South geopolitical and geographical area (SSG), were prioritized for a scale-up to saturation in the Sub National Unit (SNU) to bump treatment coverage to 81% by the end of 2020 (USPEFAR, 2020; See Figures 3 and 4).

Figure 2

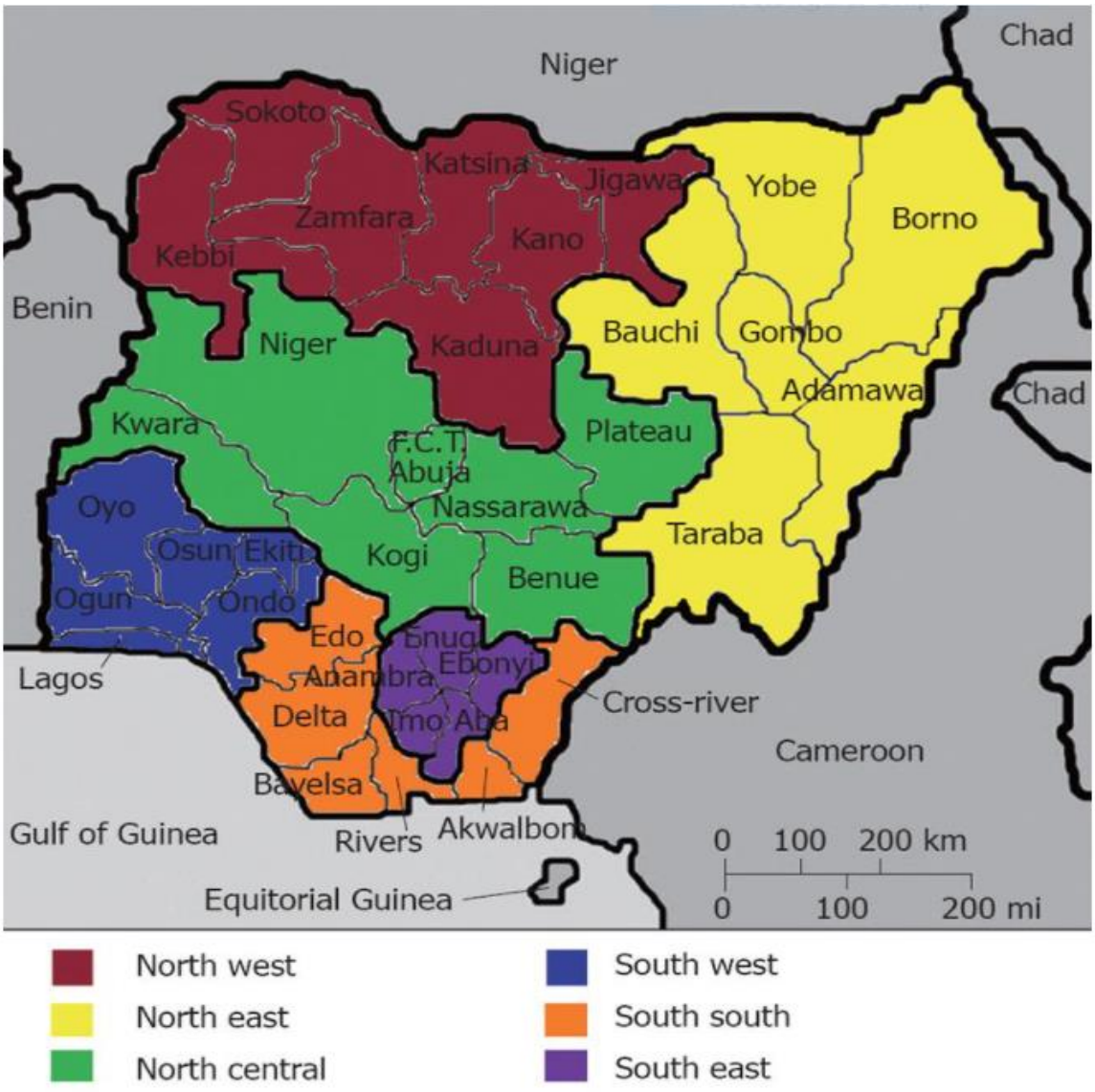
States Ranked by Unmet Treatment Needs



From "Nigeria country operational plan (COP) 2020 Strategic Direction Summary released March 18, 2020by United States President's Emergency Plan for AIDS Relief, p. 28 (https://www.state.gov/wp-content/uploads/2020/07/COP-2020-Nigeria-SDS-Final-.pdf).

Figure 3

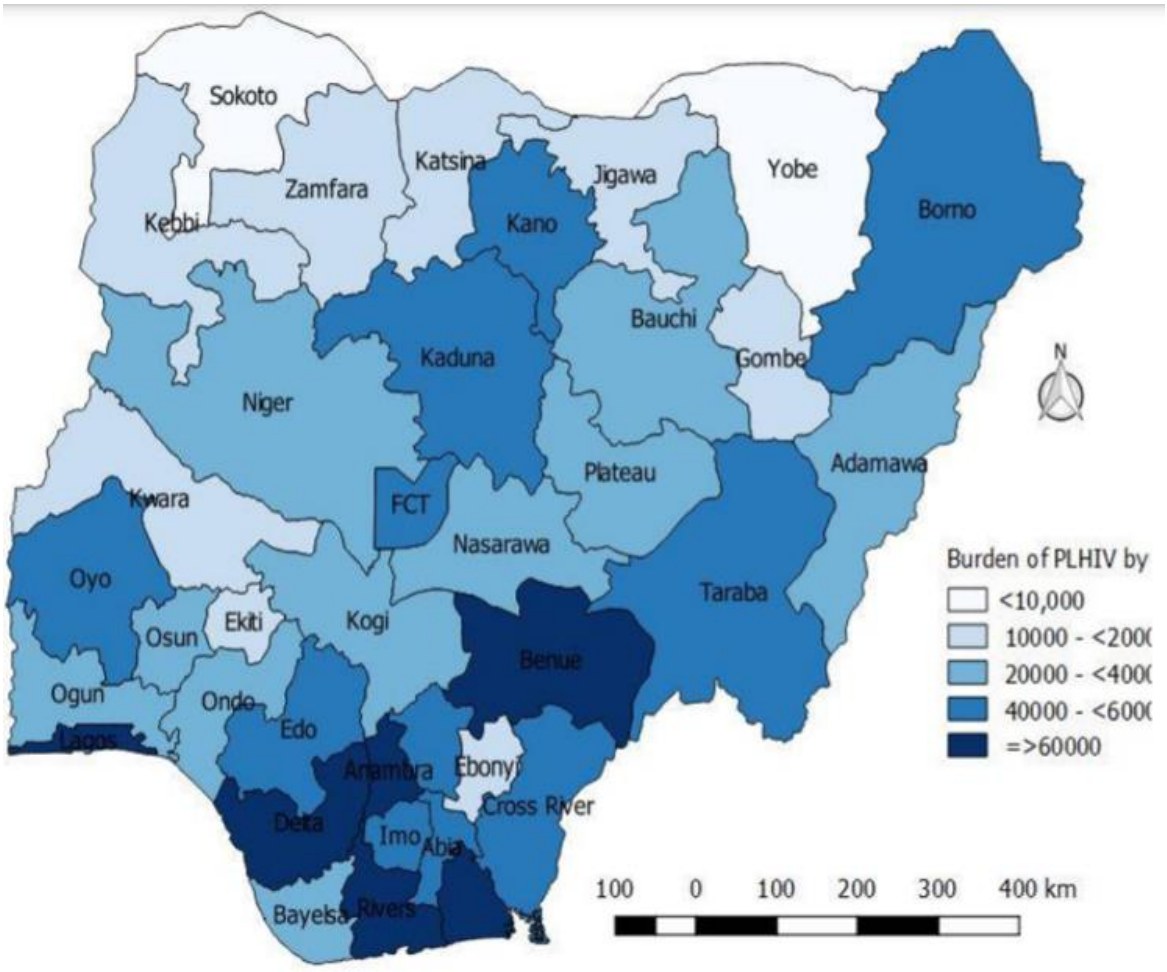
Map of Nigeria Showing the 36 States and Federal Capital Territory as Well as the 6 Geopolitical Zones



From Blood pressure, prevalence of hypertension, and hypertension related complications in Nigerian Africans: A review" by Ogah et al., 2012, World J Cardiol, 2012, 4(12): 327-340. doi: https://dx.doi.org/10.4330/wjc.v4.i12.327

Figure 4

Nigeria's PLHIV Burden by Sub-National Units



From Nigeria Country Operational Plan (COP) 2020 Strategic Direction Summary Released March 18, 2020 by United States President's Emergency Plan for AIDS Relief, p.27 (https://www.state.gov/wp-content/uploads/2020/07/COP-2020-Nigeria-SDS-Final-.pdf.)

Achieving 81% SNU treatment coverage will require that PLHIV are in the continuum of care or HIV treatment cascade (HTC), according to the National Institute for Health Office of AIDS Research (2017), in which LC, MA, and CR are components. The containment of the HIV surge will require an indigent approach tailored to fit the country's needs and population. UNAIDS' Deputy Executive Director, Programme Eamonn Murphy, framed this approach in the context of deploying cutting-edge medical innovations to communities needing urgent HIV care to address inequalities in access that perpetuated HIV in a harmful way (UNAIDS, 2022a). A holistic patient-centered approach to providing care for PLHIV is also needed to bind together economic, social, emotional, and physiological aspects to improve RIC and ART adherence (ARTA; Chinyandura et al., 2022).

The topic of my dissertation is gender based HIV epidemic, CR, and MA in AKS, South-South Nigeria. A literature review of this topic showed a significant research vacuum in gender-based strategies necessary for the improvement of LC, MA, and CR in the AKS, SSG, and a gap in HIV care strategies in AKS. The focus of early HIV scholars in Akwa Ibom was on the socio-cultural influences and other factors enhancing HIV spread, leaving a gap that requires research that will examine the association between gender and LC, MA, and CR with sociodemographic characteristics (SDC; location, age, education, marital status, employment, occupation, ethnic group), HIV knowledge (HIVK), and attitude to HIV (AHIV) as moderators. Since the impact of gender on the drivers of HIV epidemic was an unexplored area of research in AKS (Adedokun et al., 2020), my research is needed to delineate how gender drives HIV infection (which driver

associates more with being a man or a woman). The result of this study could provide meaningful insight into how gender impacts the drivers of HIV and also add to the body of knowledge on LC, MA, and CR. The study's recommendation may guide HIV program managers and provide resource material to reference while designing programs to improve gender-based HIV care along the continuum (LC, MA, and CR). The result from this cross-sectional study could help close the gap in HIV care strategies in AKS.

The positive social change goal of this research is that we could learn more about LC, CR, and MA to provide evidence-based resources to HIV care providers and policymakers in AKS on the delivery of individualized HIV preventive measures. Such a delivery method could help reduce the burden of HIV and improve the lives of individuals, families, and communities. Additionally, policymakers may reference the information generated from the data analysis during assessment, implementation, and evaluation of projects that could improve LC, MA, and CR to contain the HIV surge in AKS. The study's findings could guide those in the HIV field by identifying the varying needs of populations based on gender, which could be crucial in helping individuals living with AIDS achieve long-lasting MA necessary to sustain the PLHIV's lives. Implementing changes to address gender needs and disparity challenges could help PLHIV comply with care regimens. The study could promote positive behavioral changes that may facilitate increased awareness of the benefits of the HIV care cascade (HIVCC) in AKS.

This chapter of the study will describe the rationale for this study. The chapter will have the following sections: background, problem statement, study purpose, research

questions/hypothesis, theoretical framework, and the nature of the study. Also included in the chapter will be definitions, assumptions about the study, scope, limitations, and significance.

Background of the Problem

My research explored the impact of gender on the drivers of HIV epidemic in AKS. Specifically, the study examined the association between gender and LC, MA, and CR after controlling for SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV because of the high rate of new HIV cases in persons 15 years and older in AKS. According to Adedokun et al. (2020) and Negedu-Momoh et al. (2021), the rate of new HIV cases in persons ≥15 years was 13,000 annually as of 2018. Worldwide about 79.3 million [55.9–110 million] people have been infected with HIV, and about 36.3 million [27.2–47.8 million] people have died since the beginning of the epidemic as at 2020 (WHO, 2022b). In 2020, about 28 million of the over 38 million PLHIV worldwide were on life-saving ART, while more than 10 million PLHIV did not have access to life-saving ART, which could potentially fuel HIV spread and further the development of new HIV variants (UNAIDS, 2022a).

HIV is among today's most severe and challenging public health afflictions (HIV.gov. 2021b; Kaiser Family Foundation [KFF], 2021). The disease is an epidemic due to its devastating effects on the world's population (Kaiser Family Foundation [KFF], 2021; HIV.gov, 2021a; UNAIDS, 2019; WHO, 2022a). HIV prevalence among the most productive age groups emasculates economic growth through reduced life expectancy (NewsRx, 2019). Furthermore, PLHIV are disposed to problems with employment,

healthcare, education, and stigma (Kose et al., 2012). According to The Global Fund (TGF, 2019), years of experience and a greater understanding of HIV prevention and treatment would have enabled the world to end the HIV epidemic as a public health problem, but this is not the case. Some countries are struggling to maintain the gains made toward epidemic control because they cannot retain patients, keep people on life-long ART, and provide services and a better direction on how HIV services should be planned and delivered (WHO, 2020a). An epidemic-free goal could be achieved if a more focused approach is adopted to address the vulnerabilities that lead to HIV infection, including targeting high-risk HIV populations and those most affected by HIV (TGF, 2019).

Current literature leaves a gap in gender-based strategies to improve LC, MA, and CR among PLHIV in AKS because no published literature has addressed the impact of gender on the drivers of HIV along the HTC (LC, MA, and CR). The impact of gender on the drivers of HIV epidemic along the HTC was an unexplored area of research in AKS (Adedokun et al., 2020), and my research is needed to examine how gender drives HIV infection (which driver is associated with being a man or a woman) and help close the gaps in the literature. My study could make reference resources available on gender impacts on the drivers of the HIV epidemic in AKS along the HTC continuum (LC, MA, and CR) and help sustain the AKS HIV care strategies. The research findings could provide evidence-based information to HIV care providers and policymakers in AKS on the approach and delivery of individualized HIV preventive measures. Such a delivery

method could help reduce the burden of HIV and improve the lives of individuals, families, and communities.

Statement of Problem

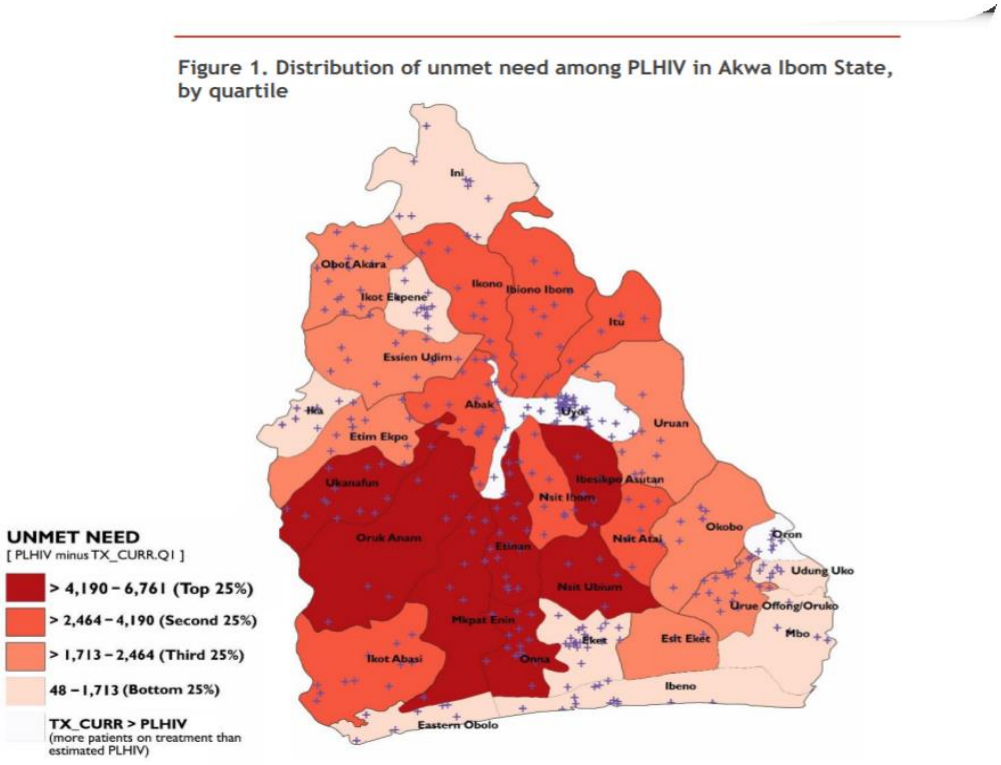
Even though the population of men is more than women in AKS, according to the Akwa Ibom State Ministry of Economic Development (AKSMED, 2013; City Population, 2017; National Bureau of Statistics [NBS], 2017), more women in AKS are living with HIV (AKSMED, 2013; NBS, 2019). Family Health International [FHI], 2019, and Sabri et al. (2017) identified low perception of HIV risk and lack of access to ART as the drivers of HIV perpetuation in men and women. Others are high-risk sexual behavior (FHI, 2019), intravenous drug use abuse (Sabri et al., 2017), and "socio-cultural practices, and religious and superstitious beliefs about HIV/AIDS that adversely affect the health-seeking behavior of the population" (Akai, 2021, para. 4). These practices could fuel stigma and discrimination within the various communities and constitute a significant barrier to access to care (FHI, 2019).

People further exacerbate the disproportionate perpetuation of the epidemic by not complying with treatment regimens or remaining on treatment to achieve VLS in line with the outlined UNAIDS' 95-95-95 targets (FHI, 2019). When PLHIV are not adhering to ART and not retained in care, the results, according to Mukumbang et al. (2017), are failure to achieve VLS and treatment failure. AKS was designated by the FGN among the "12+1 HIV High Burden States," with prioritization for accelerated HIV response because of the challenges associated with reducing new infections and improving health outcomes (Akwa Ibom State Ministry of Health [AKSMOH], FHI 360, and UNAIDS,

2013; US Mission, 2017; USPEFAR, 2020). Despite the special designation and resources invested in reducing HIV numbers in AKS, in 2019, the prevalence of HIV was 5.5%, HIV estimated burden of 178,000 among PLHIV, and more than 120,000 with unmet needs for ART (Adedokun et al., 2020; FHI, 2019; See Figure 5), the highest level in Nigeria which was concerning.

Figure 5

Distribution of Unmet Need Among PLHIV in AKS



From, "Figure 1: Mind the Gap: Leveraging the National HIV/AIDS Indicator and Impact Survey (NAIIS) Data to Identify Service Delivery Gaps in Akwa Ibom State," by Data for Information (2020), (http://pdf.usaid.gov/pdf_docs/PA00XBDD.pdf

According to TGF (2019), young women 15-24 years of age have a 60% higher HIV rate globally than their male counterparts. Worldwide, more than half of PLHIV are women, according to Avert (2020b). Avert also asserted that the vulnerabilities created by unequal cultural, social, and economic status disproportionately affect women and adolescent girls, exposing them to HIV. The feminization of the epidemic in Nigeria is attributed to social factors such as poverty, child marriage, gender-based violence, gender norms, disabilities, harmful traditional practices, human rights, and legal and political factors (Adedokun et al., 2020).

PLHIV suffers from economic discrimination and stigma in some societies because of the association of the infection with immoral behavior and punishment for same-sex sexual activity by the public (United States Department of State [USDS], 2020). In these societies, persons with HIV/AIDS often suffer from social and economic denial, such as losing their jobs and denial of healthcare services (USDS, 2020). According to Amin (2015), women are simply directing their energies toward securing fundamental survival needs such as clean drinking water, food, and shelter for themselves and their families, thus neglecting their health needs and compromising their care within the HTC or HIVCC.

Exploring how gender disparity impacts the various drivers responsible for HIV perpetuation in AKS along the HTC is necessary to guide the development and implementation of gender-specific care; and provide an understanding of how gender interacts with these drivers along the HIVCC to stifle LC, MA, and CR. Avert (2020b) and TGF (2019) had acknowledged the existence of a disproportionate global

vulnerability to HIV infection and its burden based on gender and socio-economic status. Though Wilde (2018), asserted that the rate of MA is lower in women than in men, there is no published consensus in the literature on why women have lower adherence rates than men. Women from AKS may not be an exemption from this trend.

The discipline of public health promotes and protects the health of people and the communities where they live, learn, work, and play (American Public Health Association, 2021). HIV as a health problem is relevant and significant to this discipline because it impacts the quality of life (QoL). QoL is a term popularly used to convey an overall sense of well-being and includes aspects such as happiness and satisfaction with life (Basavaraj et al., 2010). WHO defines QoL as "individuals' perceptions of their position in life in the context of the culture and value systems in which they live in relation to their goals, standards, expectations, and concerns" (Basavaraj et al., 2010; p. 75).

HIV/AIDS has been one of the most significant health problems in the world as the disease compounds the burden on the population's health, causing a further socioeconomic decline in individuals, families, communities, and governments in many countries (Basavaraj et al., 2010). Improved QoL of PLHIV is a central part of the care and support that PLHIV deserves for better clinical outcomes because it could impact the outcome of treatments and interventions rendered (Cooper et al., 2017). HIV/AIDS is one of Africa's leading causes of mortality and morbidity, as it dwarfs economic growth and threatens human development by reducing life expectancy (Dauda, 2019). The disease also affects numerous bodily, mental, and social functioning that directly and indirectly

affect individuals, their families, and communities (All Answers, 2019). In AKS, where the main occupation is farming, with the rest employed in government offices, it reduces the human resources needed in an economy where agriculture is not mechanized - which leads to reduce food – poor health. HIV has a high burden on AKS because it affects the productive age group in the population, according to Negedu-Momoh et al. (2021).

This research could address the perceived problem related to the disparity in LC, MA, and CR in both sexes and the disproportionate vulnerability to the infection and its burden based on gender. Current literature leaves a gap in gender-based strategies to improve LC, MA, and CR among PLHIV in AKS because no published literature has addressed the impact of gender on the drivers of HIV along the HTC (LC, MA, and CR). There is paucity of research materials specific to AKS on whether there is an association between gender and LC, MA, and CR. The identified gap in the literature that this research intends to fill includes identifying how gender impacts the drivers of HIV care along the HTC (LC, MA, and CR), which may be the leading cause of HIV infection in AKS, Nigeria. As Negedu-Momoh et al. (2021) recommended, research is needed to understand better the factors driving HIV transmission in AKS. My research is therefore needed to examine how gender drives HIV infection (which drivers are associated with being a man or a woman) and help close the gaps in the literature.

Purpose of the Study

Although researchers have investigated LC, MA, and CR in PLHIV, no study has explored or examined how gender impacts the drivers of the HIV epidemic at the various levels of the HIV Cascade (LC, MA, and CR), especially in AKS, Nigeria. The

quantitative approach was adopted while exploring gender drivers of the HIV epidemic in AKS using data from the Akwa Ibom State AIDS Indicator Survey (AKAIS). My study examined the association between gender and LC, MA, and CR with SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV as moderators. The independent variable in this research was gender (male or female) and the dependent variables was LC, MA, and CR. The covariates for the study were SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV. Despite differences in the facilitators and barriers to LC, MA, and CR between men and women (Avert, 2020b; TGF, 2019), the consequences are the same - treatment failure and inability to achieve VLS (Li et al., 2020). Li et al. (2020) reported on the ongoing debate on the differences in treatment outcomes between men and women living with HIV. My study on gender-based HIV epidemic could lend a voice to that debate.

This study may help to explore whether gender evenly impacts the drivers of the HIV epidemic, which is yet to be studied. The study result may address concerns and answer questions on the roles of extraneous variables. The study may deepen the knowledge or understanding of the dynamics of HIV transmission (Chandwani & Gopal, 2010; National Agency for Control of AIDS [NACA], 2021a). A better appreciation of HIV dynamics may be gained from this study "as it explores the broader context of poverty, inequality, and social exclusion (socio-economic, cultural, and ecological determinants), which breed and allow unsafe conditions and behaviors to flourish" (Akai, 2021, para. 4). This research may identify the infection correlates by providing

information or resources that could be used to refine messages needed for directing preventive activities to the target population.

We could learn new things from this study that may contribute to ending the HIV surge, lowering the rate of new HIV infection, and reducing the HIV epidemic in AKS. This study's result could help develop culturally congruent prevention interventions and programs for PLHIV in AKS, Nigeria. Some variables in this study have more foundational literature than others, but all the examined variables could impact LC, MA, and CR. This study may determine whether a significant relationship exists between gender and the dependent variables, including the moderating influence of the identified covariates in AKS.

Research Questions and Hypothesis

RQ1: Is there an association between gender and LC after controlling for SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV?

$H_0$1: There is no statistically significant association between gender and LC after controlling for SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV.

$H_1$1: There is a statistically significant association between gender and LC after controlling for SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV.

RQ2: Is there an association between gender and HIV and retention after controlling for SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV?

$H_0$2: There is no statistically significant association between gender and HIV CR after controlling for SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV.

$H_1$2: There is a statistically significant association between gender and HIV CR after controlling SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV.

RQ3: Is there an association between gender and HIV MA after controlling for socio-demographic characteristics (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV?

$H_0$3: There is no statistically significant association between gender and HIV MA after controlling for SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV.

$H_1$3: There is a statistically significant association between gender and HIV MA after controlling for SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV.

Theoretical Framework

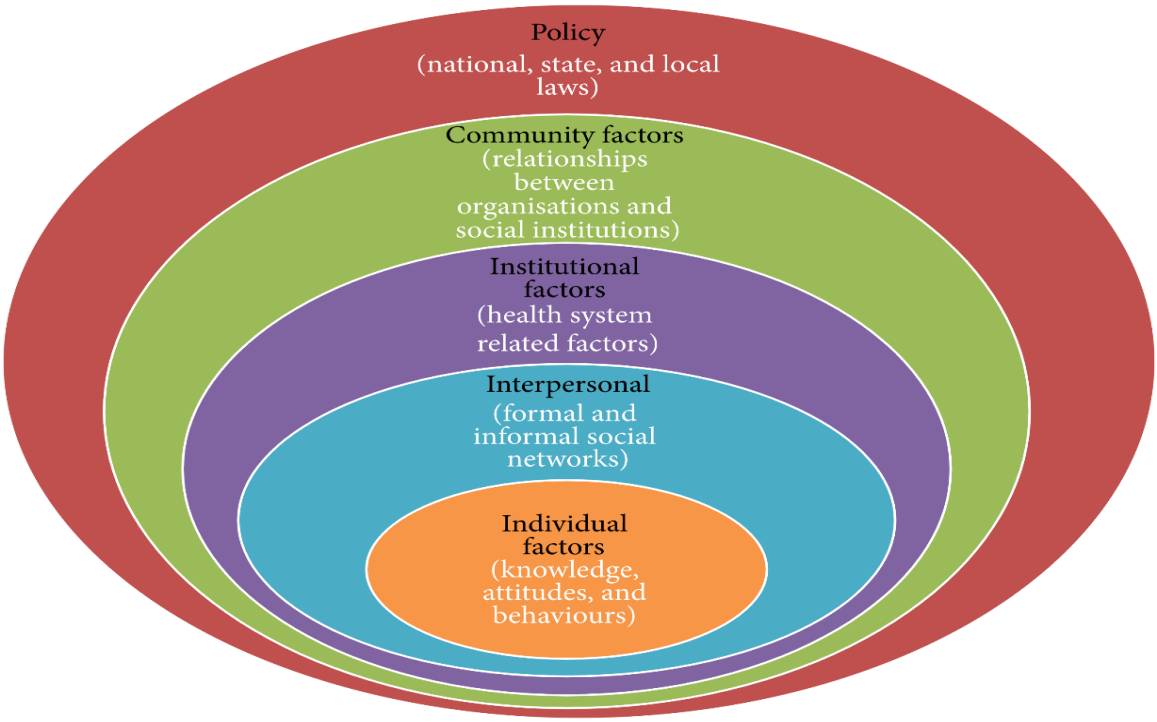
The Socio-Ecological Model

The socio-ecological model (SEM) focuses on the major contributors that might affect health, and as a construct, broadly conceptualizes the concept of health (Figure 6).

According to Kilanowski (2017), the SEM conceptualized that the interactions of characteristics in the individual, the community, and the environment (that includes physical, social, and political components) affect health. Urie Bronfenbrenner first introduced the SEM in the 1970s as a conceptual model to help better understand human development. However, later in the 1980s, the model was formalized as a theory (Kilanowski, 2017).

Figure 6

The Five Levels of the SEM



From Conceptualizing the Factors Affecting Retention in Care of Patients on antiretroviral treatment in Kabwe District, Zambia, Using the Ecological Framework, by Mukumbang et al., 2017, AIDS Research & Treatment, p. 2 (https://doi.10.1155/2017/7356362)

At its initial development stage, the SEM illustration was a nesting circle with individuals at the center surrounded by various systems (Kilanowski, 2017). These systems were the microsystem, mesosystem, exosystem, and macrosystem (Kilanowski, 2017). The individual closest to the person is the microsystem, closest encompasses the interactions and relationships of the immediate surroundings and contains the most potent influences. The mesosystem, as the second system or circle, includes contact with the individual, such as work, school, church, and neighborhood, and looks beyond immediate interactions. The third system, the exosystem, such as community contexts and social networks, does not directly impact the individual but exerts negative and positive interactive forces. The macrosystem includes societal, religious, and cultural values. The chronosystem was the policy and other internal and external elements of time and historical content. The SEM was popularized and gained a wider acceptance with its adoption by the CDC for various health promotion endeavors, including the interpersonal, organizational, community, and policy spheres. Subsequent revisions and adoptions used the SEM to represent multilevel approaches to public health promotion, violence prevention, healthy college campuses, geriatric preventive health, and colorectal cancer prevention (Kilanowski, 2017).

The SEM was the framework of choice for this study. This framework, according to Coreil (2009), explains how factors within and outside the individual determine health status and how the remediation enhances health and well-being. Public health researchers extensively used the 5 levels of this model to identify intrapersonal, interpersonal

processes, institutional, community, and public policy factors (Coreil, 2009) that interact and influence health behavior (Figure 6). The framework enhances an understanding of the various levels of HIV risk, and contributes to the implementation of new initiatives in preventive measures by recognizing the need for delivery in the form of packages of services necessary for addressing multilevel HIV infection risks (Baral et al., 2013).

Ferrer et al. (2015) used the SEM in a study of ethnically diverse young women to examine the barriers and facilitators influencing the uptake of school-based HPV vaccination programs. The SEM was used in my research because researchers such as Yakob and Ncama (2016) stated that it provides a valuable framework for investigating the interplay among the multilevel and interactive factors that could impact access to and acceptability of HIV/AIDS treatment and care services. A significant strength of the SEM in my study was that it enhanced the explanation of behavioral change and environmental enhancement strategies. By using the SEM as an analytical lens, this study explored the obstacles and facilitators to retention in HIV care (RHIVC) and ARTA in patients at the individual, interpersonal, organizational, community, and societal levels of HIV care.

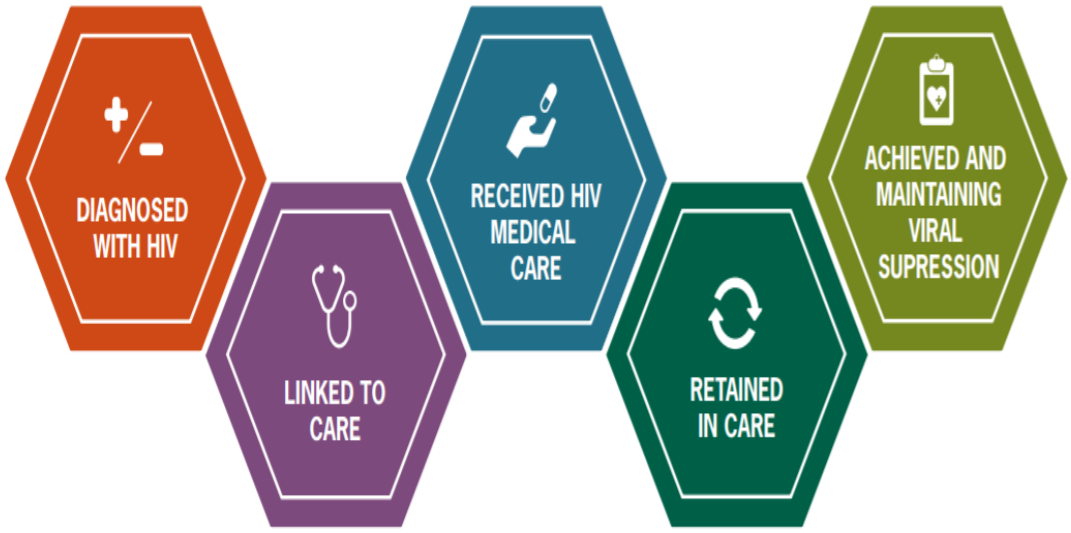
HIV Treatment Cascade

The HTC, which is a public health model adopted for HIV care, outlines the whole spectrum of the HIVCC in steps or stages which people with HIV have to go through, from the initial diagnosis to achieving and maintaining a very low or undetectable amount of the virus in the body or VLS (Figure 7; Avert, 2021a; HIV.gov., 2021; Kay et al., 2016). According to Valdiserri (2012), Dr. Edward Gardner and

colleagues were the first to describe this model as a way to examine critical questions regarding HIV care.

Figure 7

HIV Care Cascades or HTC



From What is the HIV Care Continuum?HIV.gov., 2021c, (https://www.hiv.gov/federal-response/policies-issues/hiv-aids-care-continuum).

The stages of the HTC model are - diagnosis of HIV infection, active linkage in care, initiation of ART, RIC, and eventual VS (Figure 7). The HTC is a way to show, in visual form, the numbers of PLHIV who are benefitting fully from the medical treatment and care that they need (Valdiserri, 2012). Gardner and colleagues carried out a review of current HIV/AIDS research, and during that process developed and published their

findings which reflected estimates of engagement levels of PLHIV in the United States at the various steps in the HTC (from diagnosis through VS) in the March 2011 edition of the journal Clinical Infectious Diseases (Valdiserri, 2012). Findings from Gardner and colleagues' review showed that a significant number of PLHIV in the United States fell off along each step of the cascade, with only a minority achieving suppression of their viral infection. A report from analysis of surveillance datasets, CD4 laboratory reports, viral load, and other published data by the CDC to develop national estimates of the number of persons infected with HIV at each step of the HTC (treatment cascade) in the United States in late 2011were similar to Gardner and colleagues' findings (Valdiserri, 2012).

As asserted by Valdiserri (2012), the federal, state, and local agencies are using this concept to identify opportunities and issues related to improving the delivery of services to PLHIV across the entire continuum of care. Critical questions could be examined when the HTC is used, such as "How many PLHIV are tested and diagnosed?" "How many of these numbers are linked to care?" "What is the number retained in care from the numbers linked to care?" "How many PLHIV from those taking ART adhered to the treatment plan to achieve VS?" (Valdiserri, 2012, para. 7)

Researchers, including Berger et al. (2016), have found that poor participation in HIV care is associated with adverse outcomes, such as treatment failure, progression to AIDS and related illness, and increased mortality among PLHIV. There is overwhelming evidence that when the HTC is strictly followed by PLHIV, the emergence of HIV drug-resistant strains and infection resurgence are prevented (Avert, 2021a; Kay et al., 2016).

As shown in Figure 7, five steps make up the HTC: diagnosis, LC, MA, CR, and VS (Avert, 2021a; Kay et al., 2016). Although linearly and unidirectionally shown, it is not uncommon for a PLHIV to get into and experience care within the HTC in a less organized fashion by skipping steps altogether, or even dropping out of the continuum for a while and regressing to an earlier stage (Kay et al., 2016). WHO recommends that everyone living with HIV or testing positive for the virus should be treated as soon as possible through entry into the treatment cascade to limit disease progression ('treat all' policy; Avert, 2021a), which fits into the HTC framework.

When policymakers and service providers examine these steps closely, they may gain the information they need to pinpoint the gaps in connecting PLHIV/AIDS to sustained quality care. Information from the HTC analysis may help national, state, and local policymakers and service providers to implement system improvements and service enhancements, knowing where the drop-offs are most pronounced and which populations need to be supported in their movement from one step on the continuum to the next.

Connection of the Framework to Study

This study explored and explained individuals' unique factors enabling or limiting LC, MA, and CR using the SEM (Figure 6) and HTC frameworks (Figure 7) as a guide. According to Yacob and Ncama (2016), SEM is a general framework of systems that could explain the interactive factors related to access to and acceptability of HIV care and treatment services. Yacob and Ncama applied the SEM framework to highlight the interdependent relationships between individuals' behaviors and the social context affecting HIV/AIDS treatment and care service. SEM has been used to explain those

factors which enable or inhibit HIV MA (Wilde, 2018); to study CR and MA (Umeokonkwo et al., 2019); and in a diverse socio-cultural context as a guide to epidemiologic studies among key populations at risk for HIV (Baral et al., 2013). Berger et al. (2016), Isaac et al. (2021), and Kay et al. (2016) used concepts from HTC to define and explain the full spectrum of HIV care and factors that could either support or impede care within this continuum.

The HTC was an appropriate framework for this research because of its practical application at the individual level to assess care outcomes and at the population level to analyze the proportion of community members with HIV at the various successive steps (Ekeji, 2021). SEM could be used in research to identify barriers and facilitators at various levels of the HTC to assist with specific planning and interventions strategies. The study examined how the covariates moderated the interaction of the independent variable (gender) with the dependent variables (LC, CR, and MA).

The moderating variables are those for which the intervention has a different effect at different values of the moderating variable (MacKinnon, 2011). These factors are drivers of HIV perpetuation in both genders. The SEM was incorporated in this study to help identify those variables that impact LC, MA, and CR since there is an interplay between various factors in determining health behavior and health promotion. This study had a logical connection with these frameworks.

Nature of the Study

The design for this doctoral research was the quantitative cross-sectional design because of its benefits. Researchers, such as Wilde (2018) and Yusuf (2019), have

acclaimed how this design promotes a better understanding of how to approach HIV MA and factors that may improve it or act as barriers. According to Wang and Cheng (2020), a cross-sectional study facilitates data analysis from a population at a single point, effectively measures the prevalence of health outcomes, guides the understanding of determinants of health, and is an excellent tool for describing the features of a population. At the same time, the quantitative research method can provide insight into the relationship among the variables in the study (Sana, 2019). Better public health practices and experience for PLHIV may be enhanced using quantitative analysis to answer research questions (Yusuf, 2019).

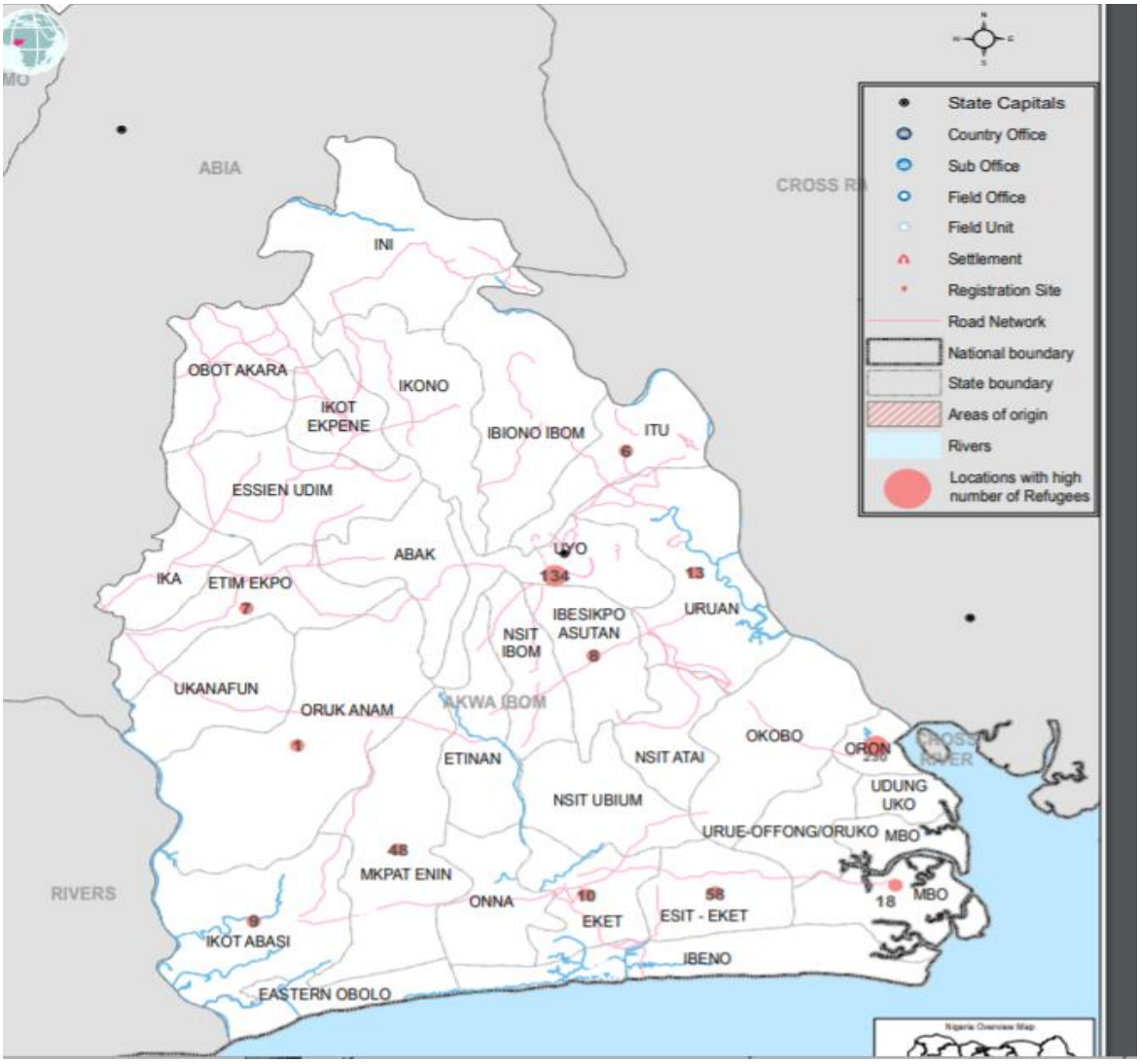
The AKAIS, a household population-based cross-sectional survey conducted from 1 April 2017 to June 2017 (The Sun Nigeria, 2017; VML, 2022), was the secondary data source for the study. AKAIS was the first widely disseminated HIV-focused survey in Nigeria with a more accurate estimate of HIV prevalence designed to enhance evidence-based guidance on future HIV control activities in AKS (AKSMOH, 2022). The US Agency for International Development (USAID) sponsored AKAIS in collaboration with the AKS government and USAID implementing partner FHI 360 (US Mission, 2017).

The study (AKAIS) adopted a two-stage probability sampling to select 8963 participants aged ≥15 years at household levels in all the 31 Local Government Areas (LGA) of AKS (See Figure 8; Adedokun et al., 2020; Negedu-Momoh et al., 2021). The two parts survey used the questionnaire to collect household information, demographics, socio-economic, and behavioral risk factors associated with HIV for the behavioral component of the study from 8,963 participants, and the laboratory part involved the

collection of venous blood samples from 8,306 participants who were over 19 months (Negedu-Momoh et al., 2021).

Figure 8

Map of Akwa Ibom State With Local Government Areas (LGAs)



From, Akwa Ibom: Reference Map by UNHCR Nigeria, HDX Updated: January 2020, (http://www.unchr.org/)

Wilde (2018) adopted a similar approach (a cross-sectional study) to study the impact of the transmission mode on HIV/AIDS and MA, while Mukumbang et al. (2017) employed it to conceptualize the factors associated with RHIVC services. Umeokonkwo et al. (2019) used a cross-sectional quantitative survey to study RIC and adherence to HIV medications or MA and AIDS treatment in Anambra State, Nigeria. Bbuye et al. (2022) adopted the quantitative cross-sectional study to research factors associated with linkage to HIV care among Uganda's oral self-tested HIV-positive adults.

In this quantitative cross-sectional study, the association between gender and other variables of interest will be tested (see Aschengrau & Seage, 2014). Gender, the independent variable in this study, is male or female (Wilde, 2018). MA means a PLHIV history of taking HIV medications exactly as instructed by a health care provider (HIV.gov, 2021c). CR is a PLHIV that makes at least two medical visits every 12 months, with a minimum of 90 days between visits (Izudi et al., 2018; Roscoe & Hachey, 2020). Determining RHIVC within 1 year involves at least four healthcare visits in 12 months before this study, with at least one, embarked on each quarter (Mukumbang et al., 2017; Umeokonkwo et al., 2019). LC is the first clinic attendance date performed within 3 months of HIV diagnosis in which the patient enters into specialist HIV care (Croxford et al., 2018; Koduah et al., 2019). The covariates were: SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV.

A cross-sectional design was appropriate for this study because of its benefits. In this quantitative cross-sectional study, answers to the four research questions showed the interactions of the independent variables with the dependent variables through the

moderation of the covariates to provide a better understanding of the various factors that disproportionately impact HIV care in AKS. This did help examination of how gender interacts with the drivers of HIV with the moderation of SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV to impact HTC (LC, MA, and CA) in AKS. The effect of gender on the dependent variables, with the moderation of the covariates, were examined using bivariate logistic regression analysis and the Chi-square test of the association.

Definition of Terms

Attitude to HIV: AHIV is the way others feel and relate to PLHIV by the expression of words or actions.

Care retention: The Institute of Medicine has defined retention in HIV medical care as at least two healthcare visits every 12 months, with a minimum of 90 days between visits (Roscoe & Hachey, 2020).

Epidemic: According to Columbia University (2021) and the Deputy Director of Health Science (2012), an epidemic is a sudden surge in the number of disease cases in a specific geographical area caused by a disease agent in an amount capable of being effectively conveyed from a source to a susceptible host.

Gender: The state of being a man or woman (typically used regarding social and cultural differences rather than biological ones; Wilde, 2019). The measurement of the variable will be self-reported information from the study's participants. The level of data for this variable was a nominal scale scored 1 for women and 2 for men.

HIV care and treatment: HIV care and treatment is taking medication as prescribed to reach a level where the viral load cannot be detected or VS, leading to low or no risk of HIV transmission (Division of HIV Prevention, 2021).

HIV knowledge: HIVK refers to people with HIV who have received an HIV diagnosis (Division of HIV Prevention, 2022).

HIV status: HIV status is knowledge of a positive HIV test confirmed after a HIV test, which means there is evidence of HIV in the body.

HIV testing: HIV testing is a client-initiated test or diagnostic HIV testing, or routine HIV testing (UNAIDS, 2004) performed on an individual using blood or saliva (MedlinePlus, 2021) to determine HIV infection (HIVinfo@NIH.gov, 2021). HIV testing should not be mandatory or compulsory. During the process of HIV testing, respect for personal choices should be exercised, as well as adherence to ethical and human rights principles through consent, confidentiality, counseling, correct results, and connections to HIV care (UNAIDS, 2017)

Linkage to HIV care: LC is the first clinic attendance date performed within three months of HIV diagnosis in which the patient enters into specialist HIV care (Croxford et al., 2018; Koduah et al., 2019).

Medication adherence: MA refers to "taking medications (or other treatment) precisely as instructed by a health care provider (HIV.gov, n.d, para. 1).

Socio-demographic characteristics: SDC includes age, marital status, level of education, religious affiliation, household, employment, and income (Saeed et al., 2021).

Assumptions

This study assumed that the information from the AKAIS was complete enough to facilitate the data abstraction process because this study required full details on the variables included. This study depended on secondary data without verifying participants; therefore, the assumption was that the available data was complete and accurate and would be easily accessible to facilitate data abstraction and attain the required sample size. Another assumption was that the AKAIS data were collected ethically, without pressure on participants, intimidation, and violation of privacy rights. Additionally, all participants voluntarily consented to be included in the survey, were literate, and responded with great integrity to the research questions.

Scope and Delimitations

The scope of this dissertation is limited to gender impact on the drivers of the HIV epidemic in AKS using secondary data from AKAIS to address the variables of interest. In this study, I examined whether the covariates moderated the association between gender (independent variable) and dependent variables (LC, MA, and CR). This research could address the perceived problem related to the disparity in LC, MA, and CR in both sexes and the disproportionate vulnerability to the infection and its burden based on gender. As Negedu-Momoh et al. (2021) recommended, research is needed to understand better the factors driving HIV transmission in AKS. Current literature leaves a gap regarding gender impact on drivers of HIV along the HTC (LC, MA, & CR) among PLHIV in AKS after controlling for SDC, HIVK, and AHIV because no published literature has addressed these research questions.

The identified gap in the literature that this research intends to fill includes identifying gender-specific drivers that impact LC, MA, and CR, which may be the leading cause of HIV infection in AKS, Nigeria. The study boundaries lie within the confines of the AKAIS, with participants 15 years and above who identified as male or female and resided within the 31 LGA in AKS. Respondents who participated in the 2017 AKAIS were the only ones in this study, while the populations excluded were not part of the AKAIS. Specifically, participants who identified as HIV-positive during the survey were the only subjects in my study.

This study explored and explained individuals' unique factors enabling or hindering LC, MA, and CR using the SEM (Figure 6) and HTC (Figure 7) as frameworks. According to Yacob and Ncama (2016), SEM is a general framework of systems that could explain the interactive factors related to access to and acceptability of HIV care and treatment services. The HTC was an appropriate framework for this research because this model is helpful at the individual level to assess care outcomes and at the population level to analyze the proportion of community members with HIV at the various successive steps (Ekeji, 2021).

In this study, gender was the independent variable, while the dependent variables were LC, MA, and CR. The covariates for the survey were SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV. SEM was used in my research to identify barriers and facilitators at the various levels of the HTC. The SEM could also assist with planning and targeted individualized interventions. The study

examined how the covariates moderated the interaction of the independent variable (gender) with the dependent variables (LC, MA, and CR).

The primary goal of the quantitative research design is to make generalizations (Laerd Dissertation, 2012b). According to Polit and Beck (2010, para. 1), generalization is "an act of reasoning that involves drawing broad inferences from particular observations." Generalization allows research findings to be applied outside the sampled participants and forms the basis for evidence-based practice (Polit & Beck, 2010). Using the proper sampling technique, the right sample size and the proper procedures will help with the generalization of studies (ResarchArticles.com, 2019). Measurement errors or participants' selection could threaten the internal validity of a study that relies on secondary data (Patino & Ferreira, 2018). Other threats to internal validity are maturation and instrumentation (Laerd Dissertation, 2012a).

A significant threat to external validity is selection biases since a quantitative research design's primary goal is to make generalizations based on the sample to the population and across populations (Laerd Dissertation, 2012b). Measures to address these limitations will be taken by addressing the most prominent covariates and collecting as large a sample size as possible.

Limitations

This study used secondary data from AKAIS. Using secondary data for research may require partner-site agreement and possible fees for data accessibility. Secondary data such as the one for this study may have shortcomings, according to Olabode et al. (2019). Data may lack updated or revised information or contain inaccurate information

leading to validity issues. It may not have relevance to the population under consideration, be detailed enough, not have been initially collected for research, may not be available in the usual research formats, or may be difficult to access. Olabode et al. asserted that this could expose the researcher to possible errors that can affect the data's quality (reliability and validity) and invariably affect the research's viability. Sometimes, secondary data may not contain the variables the researcher needs to address the research questions in the current research.

According to Patino and Ferreira (2018), measurement errors or participants' selection could threaten the internal validity of a study that relies on secondary data. Other threats to internal validity are maturation which has to do with time and the effect that time has on people, and instrumentation, such as non-verbal cues that the researcher gives out that may influence the behavior and responses of participants (Laerd Dissertation, 2012a). A significant threat to external validity is selection biases since a quantitative research design's primary goal is to make generalizations based on the sample to the sampled population and across populations (Laerd Dissertation, 2012b).

The limitation of AKAIS was mainly the cross-sectional nature of the survey, which only provides a snapshot of the HIV prevalence in AKS (Adedokun et al., 2019). Another identified limitation was that the AKAIS was limited to only 8963 participants and may not represent the HIV population in AKS (Adedokun et al., 2019). Additionally, other confounding variables may be unknown to researchers and, therefore, unexamined in this study that could influence the study's results (Gourlay et al., 2013). Measures to address these limitations were taken by addressing the most prominent covariates and

collecting as large a sample size as possible. According to Adedokun et al. (2020), as part of data quality assurance during the AKAIS, validation rules were programmed into the CSPro software to detect invalid responses automatically. In the AKAIS, skip patterns were incorporated to improve the flow of questionnaire administration.

While downloading the data, further consistency checks for completeness were carried out to ensure an improvement in external validity. No known biases were identified that could influence the study's outcomes. The information obtained during AKAIS was collected using a double-blind reporting methodology to ensure bias did not influence the results. This study, therefore, believed a critical examination of the concept and assessment tools in the reliability of secondary data is essential to aid management research.

Significance of the Study

At completion, this study could be of immense significance by illuminating the context of gender disparity in HIV CR and MA. Results from the study may show whether men and women in AKS respond differently regarding service use to the factors that lead to the disproportionate perpetuation of the HIV epidemic. HIV caregivers and policymakers may gain some knowledge from this study's recommendations. The various organizations involved in HIV/AIDS prevention in AKS may learn from this study the need to individualize their approaches to care based on gender to improve uptake. The findings and recommendations from the study if effectively implemented may move AKS closer to epidemic control by reducing the treatment gap necessary for achieving the desired treatment saturation level.

The study may deepen knowledge of what Chandwani and Gopal (2010) and NACA (2021a) described as the dynamics of HIV transmission. Understanding these dynamics may be gained as the study explores the broader context of poverty, inequality, and social exclusion (socio-economic, cultural, and ecological determinants), which breed unsafe conditions and allow risky behaviors to flourish. This research may identify the infection correlates by providing the resource to refine messages and direct preventive activities to the target population. If adopted, the study recommendations could curtail the surge of HIV in AKS, leading to a reduction in the HIV epidemic. The positive social change goal or outcome from my study may include the availability of evidence-based knowledge to HIV care providers and policymakers in AKS. Such knowledge could guide the delivery of individualized HIV preventive measures along the HTC to reduce the burden of HIV and improve the lives of individuals, families, and communities.

Chapter 1 Summary

Chapter 1 of this study provided background information on gender impact on the drivers of the HIV epidemic, CR, and MA in SS Nigeria along the HTC. LC, MA, and CR can be challenging for PLHIV due to life events, not wanting to disclose HIV status, side effects of the medications, and substance abuse (CDC, 2017). This research examined how men and women are impacted differently along the HIVCC after controlling for SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV. The study's findings can allow those in the HIV field to identify the varying needs of populations based on gender, which could be crucial in

further examining how to help individuals achieve long-lasting MA to sustain the lives of PLHIV.

The chapter provided the studys overview, purpose, significance of the research, definition of terms, RQs, and limitations. The second chapter of this study is a literature review that will explore all major areas related to the gender-based HIV epidemic, CR, and MA in South-South Nigeria (SSN). The chapter will chiefly explain the gaps between previous literature and this study. The research methodology section (Chapter 3) will have the following sections: design, population/sample, data collection procedures, and instrumentation. Data analysis, ethical considerations, and sample size estimation will add content to the chapter. Chapter 4 of this study will present data analysis and findings from the research. Chapter 5 of this study will cover the interpretation of the findings, implications for social change, recommendations for action, and recommendations for future study.

Chapter 2: Literature Review

Introduction

HIV is among today's most severe and challenging public health afflictions (HIV.gov., 2021b; KFF, 2021). The infection threatens economic growth through reduced life expectancy because of its prevalence among the most productive age groups (NewsRx, 2019). Furthermore, people with HIV infection are disposed to problems with employment, healthcare, education, and stigma (Kose et al., 2012). According to UNAIDS' data for 2018, Nigeria had the second-largest HIV epidemic in the world that year and one of the highest rates of new infection in sub-Saharan Africa (Avert, 2020a). As of 2020, over 1.7 million people in Nigeria were living with HIV (960,000 women, 650,000 men, and 130,000 children up to 14 years; Statista, 2022).

Linkage of HIV patients to care, CR, and MA are crucial in the management of HIV and are indispensable for reaching clinical goals (Avert, 2021a; HIV.gov, 2021b; Kay et al., 2016). The HTC drives care in the whole spectrum of the care continuum by outlining the steps or stages that people with HIV should go through, from the initial diagnosis to achieving and maintaining a very low or undetectable amount of HIV in the body. When the HTC is used as a guideline and followed strictly by PLHIV, it prevents the emergence of HIV drug-resistant strain and infection resurgence (Avert, 2021a; Kay et al., 2016).

People further exacerbate the disproportionate perpetuation of the HIV epidemic by not complying with treatment regimens or remaining on treatment to achieve VLS in line with the laid-out UNAIDS' 95-95-95 targets (FHI, 2019). Non-adherence to ART

and low patient retention often lead to treatment failure and the inability to achieve VLS (Mukumbang et al., 2017). Effective interventions that target adherence may have a more significant impact on the population's health than any improvement in specific medical treatment, according to Lam and Presco (2015). ARTA can lead to a long and healthy life by making the virus undetectable in the blood through reduced quantity. This level defines treatment success according to the 2016 WHO Consolidated guidelines on using antiretroviral drugs to treat and prevent HIV infection (NIAAID, 2020).

Even though the population of men is more than women in AKS according to the AKSMED (2013), City Population (2017), and NBS (2017), there are more women identified as HIV positives (AKSMED, 2013; NBS, 2019). This study explores the gender-based HIV epidemic, CR, and MA in AKS, SSN, because of the high rate of new HIV cases in persons 15 years and older in AKS, which according to Adedokun et al. (2020) and Negedu-Momoh et al. (2021) was 13,000 annually as of 2018. The drivers of HIV perpetuation in both genders include reduced access to ART (FHI, 2019; Sabri et al., 2017), low HIV risk perception, and high-risk sexual behavior (FHI, 2019). Others are intravenous drug use (Sabri et al., 2017), socio-cultural practices, and religious and superstitious beliefs about HIV/AIDS that adversely affect the health-seeking behavior of the population. These practices could fuel stigma and discrimination within the various communities and constitute a significant barrier to access to care (FHI, 2019). Because reducing new infections and improving health outcomes is challenging, the FGN designated AKS among the "12+1 HIV high burden States," with prioritization for accelerated HIV response (AKSMOH, FHI 360, and UNAIDS, 2013; US Mission

Nigeria, 2017; USPEFAR, 2020). Despite this and similar measures, the state boasted the highest prevalence of HIV at 5.5%, a HIV burden estimated at 178,000 people, and an estimated 120,000 positive individuals with unmet needs for life-saving ART in 2019 (Adedokun et al., 2020; FHI, 2019), a level which is concerning. Negedu-Momoh et al. (2021), in their study, reported 19% HIV VS levels for AKS despite a scaling up of ART distribution, which they attributed to limited knowledge of HIV status and access to treatment.

According to TGF (2019), young women aged 15-24 have a 60% higher HIV rate globally than their male counterparts. Worldwide, more than half of PLHIV are women, according to Avert (2020b). Avert also asserted that the vulnerabilities created by unequal cultural, social, and economic status disproportionately affect women and adolescent girls, exposing them to HIV. Adedokun et al. (2020) identified the social factors responsible for the feminization of the epidemic in Nigeria to include: poverty, child marriage, gender-based violence, gender norms, disabilities, harmful traditional practices, human rights, legal, and political factors. Economic discrimination and stigma are also associated with HIV, in which the public considers HIV the outcome of immoral behavior and punishment for same-sex sexual activity (USDS, 2020).

In these societies, persons with HIV/AIDS often suffer from social and economic denial, such as losing their jobs and denial of healthcare services (USDS, 2020). According to Amin (2015), women are simply directing their energies toward securing fundamental survival needs such as clean drinking water, food, and shelter for themselves and their families, thus neglecting their health needs and compromising their care within

the HTC. Exploring the various drivers responsible for any gender disparity and perpetuation of HIV in AKS is necessary to guide the implementation of gender-specific care. Avert (2020b) and TGF (2019) acknowledged the existence of a disproportionate global vulnerability to HIV infection and its burden based on gender and socioeconomic status. AKS may not be an exemption from this worldwide trend.

Current literature leaves a gap regarding how gender impact of the drivers of HIV and association with LC, MA, and CR after controlling for socio-ecological characteristics, HIVK, and AHIV in AKS because no published literature has addressed this research topic. The identified gap in the literature that this research intends to fill includes identifying specific drivers that impact LC, MA, and CR, which may be the reason for the preponderance of HIV infection in AKS, Nigeria. Although researchers have investigated LC, MA, and CR in HIV care, no study has explored or examined how gender impacts the drivers of the HIV epidemic along the HTC, especially in AKS Nigeria. Despite the differences in the various facilitators and barriers to LC, MA, and CR in men and women (Avert, 2020b; TGF, 2019), the consequences are the same - treatment failure and inability to achieve VLS (Li et al., 2020). Li et al. (2020) reported on the ongoing debate on the differences in treatment outcomes between men and women living with HIV. This study could lend a voice to that debate.

This study explored whether gender impacts the drivers of the HIV epidemic evenly impact LC, CR, and MA in AKS, which is yet to be studied. The study answered questions on whether the same driver will affect a man and a woman living in the same locality in the same way, controlling for extraneous variables. The study may deepen the

understanding of what Chandwani and Gopal (2010) and the NACA (2021a) described as the dynamics of HIV transmission. A good knowledge of these dynamics may be gained as the study explores the broader context of poverty, inequality, and social exclusion (socioeconomic, cultural, and ecological determinants), which breed unsafe conditions and behaviors to flourish.

This research may identify the infection correlates by providing information to refine messages and direct preventive activities to the target population. Findings from this study could provide scientific guidance on measures that could contribute to ending the HIV surge and reducing the HIV epidemic in AKS by lowering the rate of new HIV infection. This study's result could help develop culturally congruent prevention interventions and programs for PLHIV in AKS.

Some variables used in this study have more foundational literature than others, but all the examined variables could impact LC, MA, and CR. The independent variables' impact on the independent variable, including the mediating influence of the covariates (SDC [location, age, education, marital status, employment, occupation, ethnic group], HIVK, and AHIV), were examined in this study. The current literature contains several studies on LC, MA, CR, and their usefulness in addressing the HIV scourge, but no study had looked at how the drivers of HIV impact men and women differently in AKS along the continuum and the relative impact.

This chapter will summarize the existing literature on studies related to HIV and LC, MA, and CR in patient management, models of care used, and studies on the topic.

The chapter also contains summary information on the theory that will ground the research and its appropriateness to the topic.

Literature Search Strategy

Peer-reviewed publications, research findings, textbooks, and dissertations were the sources of materials used for the literature review while conducting this study. The keywords and databases searched included Drivers of HIV, Gender and HIV, HIV epidemic, HIV/AIDS in Nigeria, HIV/AIDS in AKS, Social problems of HIV/AIDS, effects of HIV, HIV CR, HIV/AIDS MA, and HIV/AIDS CR. The databases used were PubMed, CINAHL Plus, EBSCOhost. EMBASE, Google Scholar, SAGE Research Methods, PloS ONE, WHO, Walden Library, and Google Scholar.

The literature reviewed contained many seminal works and studies which supported the topic under consideration, including the two theoretical frameworks used in the study. The literature clarified the various terms used in this research, the gap in this area, and shared other perspectives. The limit for the 35 published articles used for the literature review was 5 years, except for the theory, due to interest in seeing papers published from the development of the theory. The search in the various databases was also limited to peer-reviewed journal articles.

Theoretical Foundation/Conceptual Framework for the Study

The 5 levels of the SEM and four levels of the HTC (See Figure 6 & 7) were adopted to explain the association between the variables in this study. According to Gombachika et al. (2012), SEM evolved from the works of researchers such as Bronfenbrenner, Mc Leroy, and Stokols. The levels of the SEM are individual,

interpersonal, organizational, community, and public policy (Aronica et al., n.d.). On the other hand, the HTC, according to Kay et al. (2016), was developed based on the HIV care continuum initiative (HIVCCI). This HIVCCI was created through the U.S. president's executive order that established the national indicators for HIV care (Kay et al., 2016). A population-level cross-sectional depiction of the HIVCC consists of 5 main steps: diagnosis, LTC, CR, MA, and VS (Kay et al., 2016). HTC is a linear and unidirectional framework where PLHIV who receive care along the continuum can do so in a less streamlined fashion. In the continuum, PLHIV may skip steps altogether or even exit the continuum for some time and regress to an earlier stage (Kay et al., 2016)

The SEM is a valuable framework for investigating the interplay among multilevel and interactive factors that impact access to and acceptability of HIV/AIDS treatment and care services along the HIVCC (Yakob & Ncama, 2016). While the HTC describes the dynamic stages of HIV care from diagnosis to VS (Kay et al., 2016), SEM conceptualizes health broadly by focusing on the interplay among multilevel and interactive factors along this continuum. There is the interaction between the individual, the group/community, and the physical, social, and political environments in the development of health problems, as well as in the success or failure of attempts to address these problems (Agency for Toxic Substances and Disease Registry [ATSDR], 2015).

The versatility of the SEM has allowed it to be integrated into the components of other theories and models, thus ensuring the design of a comprehensive health promotion, disease prevention program, or policy approach (Rural Health Information Hub [RHIH], 2022). Ferrer et al. (2015) applied this framework to study the barriers and facilitators to

the uptake of school-based HPV vaccination programs in an ethnically diverse group of young women. Different organizations use variations of the SEM to address specific concerns. According to Poux (2017), while the CDC sometimes uses a four-level model, UNICEF's model has 5 levels.

Public health researchers have extensively used the intrapersonal, interpersonal processes, institutional factors, community factors, and public policy factors which are levels of the SEM, to identify and address specific health behaviors that interact and influence health (Coreil, 2009). Other uses of the SEM in public health practice are in the design of health promotion and disease prevention programs to address cardiovascular disease risk factors and multiple factors of influence on colorectal cancer prevention (RHIH, 2022). The SEM helps create sustainable solutions for at-risk individuals and societies (RHIH, 2022).

The ecological perspective is a valuable framework for understanding the range of factors that influence health and well-being and providing a complete perspective of the factors that affect specific health behaviors, including the social determinants of health (RHIH, 2022). The SEM considers the complex interplay between individual, relationship, community, and societal factors that contribute to poor health and guides the development of disease prevention and health promotion approaches that include action at those levels (National Center for Injury Prevention [NCIPC], 2022).

The SEM considers the individual and their affiliations to people, organizations, and the larger community. SEM does not only help with the identification of individual's health behaviors, it helps with but incorporates practical approach that focuses on

integrating multiple perspectives to change the physical and social environments (ATSDR, 2015). SEM explains the factors that put people at risk or protect them from experiencing or perpetrating infection (NCIPC, 2022). The SEM illustrates how factors at one level influence factors at another level. At the individual, interpersonal, community, and society levels, health professionals, researchers, and community leaders can use this model to identify factors that influences health and wellbeing (ATSDR, 2015). Besides helping to clarify these factors, the model calls for the need to act across multiple levels simultaneously and sustain prevention efforts over time (NCIPC, 2022) for effectiveness.

This research tested the hypothesis that there is no statistically significant association between gender and LC, MA, and CR after controlling for covariates. These covariates were SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV. SEM demonstrated how the individual variable (gender) affects LC, MA, and CR (MacCarthy et al., 2016). The SEM has a history of extensive application and usage in HIV studies because the theory allows researchers to explain the interactions between health and social networks, access to care factors, individual practices, and the physical environment (Baral et al. (2013). They also help explore HIV testing behavior and attitude (Dyson et al., 2018) and the barriers and facilitators to retaining and re-engaging HIV clients in care (Berger et al., 2016).

SEM has been previously used to identify and describe the interactions between individuals' behaviors using dimensions such as knowledge, attitude, behavior, social networks, social support, relationships among organizations/ institutions, and local, state, and national laws (ATSDR, 2015). Though there is a barren of research and a paucity of

literature on the gender-based HIV epidemic, CR, and MA in AKS, Nigeria, the secondary variables examined used SEM as a theoretical foundation. Many publications included in this literature review have addressed gender, SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV through the lenses of the SEM. The rationale for using this theory is that it could allow the literature to align more consistently with the primary research question of how gender affects LC, MA, and CR.

According to Mukumbang et al. (2017), previous studies in low and middle-income countries have observed that the factors influencing care are similar along the continuum of HIV care. The HTC outlines the whole spectrum of the HIVCC in steps or stages which people with HIV have to go through, from the initial diagnosis to achieving and maintaining a very low or undetectable amount of the virus in the body (Avert, 2021a; HIV.gov., 2021; Kay et al., 2016). Yacob and Ncama applied the SEM framework to highlight the interdependent relationships between individuals' behaviors and the social context affecting HIV/AIDS treatment and care service. SEM has been used to explain the enabling or prohibiting factors of HIV MA (Wilde, 2018), CR and MA research (Umeokonkwo et al., 2019), and in a diverse socio-cultural context as a guide to epidemiologic studies among key populations at risk for HIV (Baral et al., 2013). Berger et al. (2016), Isaac et al. (2021), and Kay et al. (2016) used concepts from HTC to define and explain the full spectrum of HIV care and factors that could either support or impede care within this continuum.

The HTC was an appropriate framework for this research because this model is helpful at the individual level to assess care outcomes and at the population level, to analyze the proportion of community members with HIV at the various successive steps (Ekeji, 2021). The SEM will identify those variables that cause significant barriers to LC, MA, and CR since there is an interplay between various factors in determining health behavior and health promotion. SEM could identify barriers and facilitators at various levels of the HTC and offer insight on how to intervene with specific strategies. A logical connection, therefore, exists between the frameworks and this study. The theory will help explain how intrapersonal, interpersonal/network, community, organizations, and public policy influence individuals' reactions and actions when confronted with a positive HIV test result. Choices include being linked to HIV care, adhering to or not adhering to their ART medication, and CR.

The research questions in this study were related to existing theory because published literature has shown the use of SEM in previous studies to explain these secondary variables. This study may lay the foundation for examining how gender affects care within the HIV continuum since no published literature has examined the relationship between these variables. Using the SEM as an analytical lens, this study explored the obstacles and facilitators to HIV care along the care continuum. It may provide a pathway for developing effective health interventions that could impact behaviors across the HIV treatment continuum (Babalola et al. 2017).

Gender, Linkage to Care, Care Retention, and Medication Adherence

During the literature research for this study, published data examining how gender impacts the drivers of HIV and the relationship with HIV as they relate to LC, MA, and CR was unavailable for AKS. According to Wilde (2018), some researchers have examined the broad issue of gender differences, or how the difference between males and females impacts many health conditions, susceptibility, and the development of an infection. In the field of HIV, studies have penned women's behaviors across the HIV treatment continuum to gender inequalities as the critical driver of their vulnerabilities to the infection (Almirol et al., 2018; Amin, 2015; Avert, 2020b; TGF, 2019). Globally, HIV infections among young women aged 15-24 years are 60% higher than among young men of the same age (Amin, 2015; Avert, 2020b; TGF, 2019). More than half the numbers of PLHIV worldwide are women, with women and adolescent girls disproportionately affected by HIV because of vulnerabilities created by unequal cultural, social, and economic status, according to Avert (2020b).

In the United States, for instance, the primary factors responsible for African American women's vulnerability, according to Almirol et al. (2018), are individual, network, and population factors. Poverty, low healthcare access, lack of perception of risk in a sex partner, lack of involvement in HIV prevention and testing efforts, and concurrent sexual relationships were implicated as being responsible (Almirol et al., 2018). Nigerian women's fundamental rights are negatively affected by exposure to harmful traditional practices, behavior, and attitude (USDS, 2020).

Other factors are denial of inheritance or succession rights, forced marriage, widow inheritance where women as seen as a part of their husband's property to be inherited by his family, and the use of sexual favors in exchange for employment or university grades (USDS, 2020). There is economic discrimination, the stigma associated with HIV in which the public considers HIV a disease that results from immoral behavior, and punishment for same-sex sexual activity. Thus, persons with HIV often lost their jobs or were denied healthcare services (USDS, 2020). According to Amin (2015), women neglect their health needs which compromise their care within the HTC because they are simply directing their energies toward securing fundamental survival needs such as clean drinking water, food, and shelter for themselves and their families.

There had been conflicting results from studies that had examined gender impact on PLHIV care along the continuum (Almirol et al., 2018). Some studies have shown no gender differences, others lower rates of Linkage in women, and an increased percentage of women linked to care compared with men. Almirol et al. (2018) attributed these discordant results to varying populations, healthcare systems, and geographic situations. National and regional data do not capture the driver's variability across gender, thus preventing resources from reaching those who need them most. Despite well-described disparities experienced by women compared with men along the HIVCC, insufficient research and information delineate gender-specific drivers affecting men more than women or vice versa in AKS. Also, it is unclear which perceived risks of HIV care engagement are most salient for men and women across different settings in AKS,

leaving a gap in the literature because such information may help guide the design of scalable interventions.

Effective engagement in HIV care, according to Nardell et al. (2022), must be informed not only by estimates of where and how PLHIV experiences challenges along the care continuum but also by a better understanding of subgroup variation. Some researchers in Nigeria have examined how gender perpetuates the stigmatization of PLHIV and how these gender differences affect their care (Mbonu et al., 2010), RIC, and AHIV and AIDS treatment (Umeokonkwo et al., 2019). Others, such as Obidoa et al. (2012) and Yaya et al. (2019), looked at factors associated with sexual risk behaviors and Knowledge and attitude toward HIV/AIDS. Results from this study could provide insight into how gender affects LC, MA, and CR from the perspective of HIV.

Improved QoL for PLHIV is central to the care and support of people with HIV for better clinical outcomes because it could direct treatments and interventions (Cooper et al., 2017). Ogaji and Igwebuike (2021) explored the gender difference in health-related QoL (HRQoL) of PLHIV in 512 female and 512 male HIV outpatients receiving care at the antiretroviral clinic at the University of Port Harcourt Teaching Hospital (UPTH), SSN. Ogaji and Igwebuike's research is relevant to this study on Gender-based HIV CR and MA. In the sampled population of 35.9 ± 11.8 years for the male and 35.3 ± 9.8 years for the female category in Ogaji and Igwebuike's study, the population was ambulatory HIV patients who have been consistent with their care at the ARV clinic in UPTH for more than six months and gave consent to participate in the study. The study did not include pregnant women and severely ill/debilitated patients. Data were collected over

eight weeks using a questionnaire with a response rate of 99%. The result showed that financial sufficiency for every daily need or the need to meet the financial cost for daily needs was of utmost concern to male and female HIV patients in this study. Financial sufficiency affected the males more than females (males = 48.7% and females = 43.7%) (Ogaji & Igwebuike, 2021). Public reaction to the respondents' HIV status was a minor concern of male and female HIV respondents in Ogaji and Igwebuike's 2021 study.

The result signals a positive turn of psycho-social reactions that have been a formidable challenge to preventing and controlling the scourge in many traditional societies (male = 79.2% and female = 79.0%). Female HIV patients expressed a significantly lower HRQoL in the study. The plausible explanation for the lower HRQoL among the female respondents was their subordinate position and their more significant risk of experiencing deprivation to access to education, health services, independent income, property, and legal rights. There was significantly higher HRQoL among male patients. The lower HRQoL may also be attributable to the socio-economic climate in many developing countries, prevalent HIV-related stigma; persisting gender-related inequality in economic and social status; discriminatory access to healthcare and supportive services. At the 95% CI, the effect of gender on HRQoL was 4.51% (3.63% to 5.39%) in favor of the male HIV patients. Twenty-three to thirty-one items in the WHO QoL-HIV-BREF scale showed gender-related statistically significant differences in favor of the males. The most notable gender difference was in the capacity for working, with a mean difference of 10% (95% CI: 3.0, 17.0). The employment status and age of the

patients were not significant predictors of HRQoL. QoL represents how happy or bothered people feel about lower HRQoL in various aspects of their life.

This construct reflects how personal perceptions of goals, expectations, standards, and concerns relate to the culture and value system of the environment. Physical health, psychological state, level of independence, social relations, and one's relationship with the essential elements of the environment influenced this construct. The study by Lopez-Varela et al. (2021) provides insight into the Linkage to HIV care. The authors found that of those eligible for HIV testing from a population of 11,773 adults (women = 60.2%; men 39.8%), 75.0% of men and 83.2% of women accepted HIV testing, and men were 42.4% likely to be linked to care within three months' post-diagnosis to women at 44.7%. More men at 12 months post-ART initiation (22.2%) were lost to follow-up or twofold more than women at 10.9%. At 24 months after HIV diagnosis, 9.33% more men, or almost twofold more men, died than women, which was 5.56% (Lopez-Varela et al., 2021).

In Turner et al.'s (2003) study to determine ARTA amongst women and men and evaluate the relationship between gender, medical depression, and mental health care to ARTA, women were less adherent to ART medications than men. The authors also reported that co-occurring diagnoses of depression could influence ART MA. In Berg et al., as cited by Wilde (2019), the researchers posited that there were gender differences in ART MA. Women had lower rates of adherence when compared to men (46% to 73% respectively; Wilde, 2019). However, Wilde (2019) reported that some variates that contributed to the low adherence rates in men and women were - lack of long-term

housing, crack cocaine use, not being in an HIV support group, and side effects from the ART medications. In men, low adherence rates were associated with crack cocaine use, not being in an HIV support group, and side effects from the ART medications but not instability of long-term housing, as was seen in the female participants (Wilde, 2019).

In a study conducted in Bayelsa State, SSN by Suleiman and Momo (2016), of the 31.4% of the respondents who reported 100% adherence, there were more females (56.1%) in this category than males (43.9%). Possible reasons expounded by the authors were that the females understood the importance of adherence better than the males. The females in the study were more educated and had better scores on HIV and ART-related knowledge ratings (Suleiman & Momo, 2016).

Addressing the area of RIC further, Ahonkhai et al. (2021), in their study, reported that pregnant and lactating females (PL) had an adjusted OR of 3.56 [95%CI 3.30–3.84] and nonpregnant and lactating females (NLNP) had an adjusted OR of 1.71 [95%CI 1.62–1.81] of being retained in care pre-ART. PL females (aHR 2.64, [95%CI 2.47–2.81]) and NPNL females (aHR 1.36 [95%CI 1.30–1.42)] were more likely to initiate ART than males, of the 24,840 eligible patients in the post-ART retention analysis. In the Ahonkhai et al. (2021) study, post-ART 1-year retention rates were most significant for NPNL females (56%, n = 4,800) and similarly lower for PL females (46%, n = 5,984) and males (46%, n = 1,395). After adjusting for ART guideline policies and other covariates, adolescents and young adult females were more likely to be retained in care one year following ART initiation irrespective of ART guideline policy (aOR 1.78

[95%CI 1.62–1.94] and aOR 1.50 [95%CI 1.35–1.65] for NPNL and PL females, respectively, compared to males) (Ahonkhai et al., 2021).

The deduction from these researchers based on the literature is that women have lower rates of LC, MA, and CR when compared to men. The referenced articles were included in the literature review because of their published findings regarding gender and LC, MA, and CR The strengths of these studies were that they all had relatively and, in some cases, large sample sizes, making the survey more representative and improving their generalizability. The limitations of the studies were the cross-sectional nature of the survey, which only provides a snapshot of the study variables. Furthermore, data relied on participants' self-reported.

The studies referenced did not address linkage, adherence, and retention as one topic in a single study; however, I have to draw from multiple researchers' perspectives of the individual variable to address gender-based HIV and MA in AKS. In addition, another limitation was that the research findings did not provide definitive reasons why women's adherence rates were consistently lower than men's. The results of these studies were essential to my study's primary research question because gender is a variable examined in my study to determine its impact, if any, on Linkage to HIV care, CR, and MA. No published literature has tested or delineated gender-specific drivers affecting men more than women or vice versa in AKS along the HIVCC. Therefore, my research may add to the literature on this novel area. Gender was a variable I attempted to control for in my primary research question, but also a variable examined with LC, MA, and CR

in my secondary research questions; precisely, how do an individual's gender and age influence LC, MA, and CR?

HIV Infection Rate Worldwide

HIV is among today's most severe and challenging public health afflictions (HIV.gov. 2021b; KFF, 2021). Its prevalence among the most productive age groups emasculates economic growth through reduced life expectancy (NewsRx, 2019). HIV is a challenging and severe public health problem that has affected economic and human development worldwide (KFF, 2021; NBS, 2021), with over 76 million people infected and tens of millions of deaths due to AIDS-related causes discovery (WHO, 2022b). In the year 2020, about 37,700,000 people worldwide were living with HIV (M = 16.7 million; F = 19.3 million), 1,500,000 (M = 640,000; F= 660,000) people were newly infected with the virus, 680,000 deaths (M= 340,000; F= 240,000) from causes related to HIV infections, and 73% HIV ART rate for the year 2020 (WHO, 2021) (See Figure 1). Eighty-four percent knew their viral status for the same year, and 66% had an undetectable viral load in 2020 (Ngaya et al., 2021). Twenty-eight million of the over 38 million PLHIV worldwide are on life-saving ART (UNAIDS, 2022a). In the same year, more than 10 million PLHIV did not have access to life-saving ART, which could potentially fuel HIV spread and further the development of new HIV variants (UNAIDS, 2022a).

It seems daunting to meet the USAIDS' goal of eliminating all new infections by 2030. In the 2020 perspective, 90% of PHHIV should know their HIV status, 90% of people who know their HIV status should be on HIV treatment, and 90% of people

receiving HIV treatment reach an undetectable viral load (Ngaya et al., 2021). An epidemic-free goal is achievable if a more focused approach addresses the vulnerabilities that lead to HIV infection, including targeting high-risk HIV populations or HIV and those most affected by HIV (TGF, 2019). Some countries struggle to maintain gains toward epidemic control because of their inability to retain patients, keep people on life-long ART, and provide services in a way HIV services should be planned for and delivered (WHO, 2020a).

HIV Infection Rate in Africa

In Africa, more than 25.4 million people were estimated to live with HIV in 2020; 880,000 people acquired the infection (new infections), and 460 000 deaths from HIV-related causes in the same year (WHO, 2021). Nigeria, South Africa, and Uganda account for around half of all new HIV infections in sub-Saharan Africa yearly (Avert, 2020a). An estimated 85% of all adolescents and young PLHIV resided in sub-Saharan Africa in 2019 (Mogoba et al., 2021). In West and Central Africa, the estimated percentage of PLHIV who achieved VS stood at 29% in 2017. However, the HIV response in this region is said to lag behind the rest of sub-Saharan Africa (Negedu-Momoh et al., 2021).

HIV Infection in Nigeria

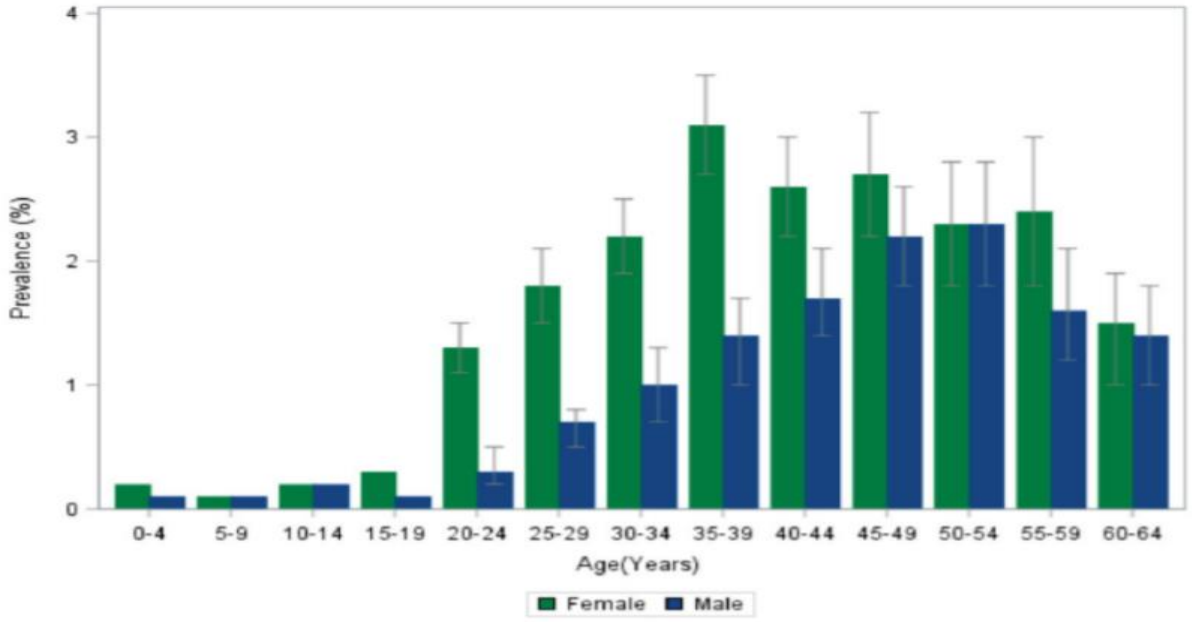
Nigeria is a country in Africa comprised of 36 States and the federal capital. For political convenience, six geopolitical zones comprise the country (see Figure 3): South-South, South East, South West, North East, North Central, and North West. According to Awofala and Ogundele (2018), HIV/AIDS was first diagnosed in Lagos, Nigeria, in 1985 but reported in 1986. However, the news evoked panic, doubt, and disbelief, with the

acronym American Idea for Discouraging Sex coined to define public perception of its origin, according to Awofala and Ogundele.

In 2019, Nigeria, which is the most populous country in Africa, according to Mosugu (2021), had the second-largest HIV epidemic in the world (Avert (2020a; Mosugu, 2021). However, the HIV prevalence among adults during the same period was about 1.3% (Figure 9) less than in other sub-Saharan African countries such as South Africa (19%) and Zambia (11.5%).

Figure 9

HIV Prevalence by Sex and Age in Nigeria



From Nigeria Country Operational Plan (COP) 2020 Strategic Direction Summary Released March 18, 2020, by United States President's Emergency Plan for AIDS Relief, p. 11 (https://www.state.gov/wp-content/uploads/2020/07/COP-2020-Nigeria-SDS-Final-.pdf).

The prevalence rate of HIV was the highest among the female adult population, at 1.6%. Despite this low prevalence rate of HIV, Nigeria is not better than most countries in tackling the HIV burden. Mosugu (2021) stated that Nigeria has the highest rate of new HIV infections based on the number of people aware of their status (Mosugu, 2021). Considering the population of Nigeria, about 1.8 million people were living with HIV in 2019 (Adebolawe, 2021; Avert, 2020a; Jahun et al., 2021), with two-thirds of new HIV infections in West and Central Africa 2019 occurring in Nigeria (Avert, 2020a). About 1,600,000 adults (M = 650,000; F = 960,000) aged 15 and over were living with HIV as of 2020 in Nigeria, newly HIV-infected adults aged 15 and over were 65 000 (M = 25,000; F = 39 000), while deaths caused by AIDS among adults aged 15 and over were 37,000 (M = 20,000; F = 16,000) (UNAIDS, 2022a). Fifty percent of Nigerians who are HIV positive do not have an awareness of their status, and only 89% of the adult population who are aware of their positive diagnosis are accessing antiretroviral treatment (Mosugu, 2021). Women made up half of the projected population of PLHIV in Nigeria in 2019 (Table 1), and the percentage of women with HIV in Nigeria increased

Table 1

Percentage of women with HIV in Nigeria

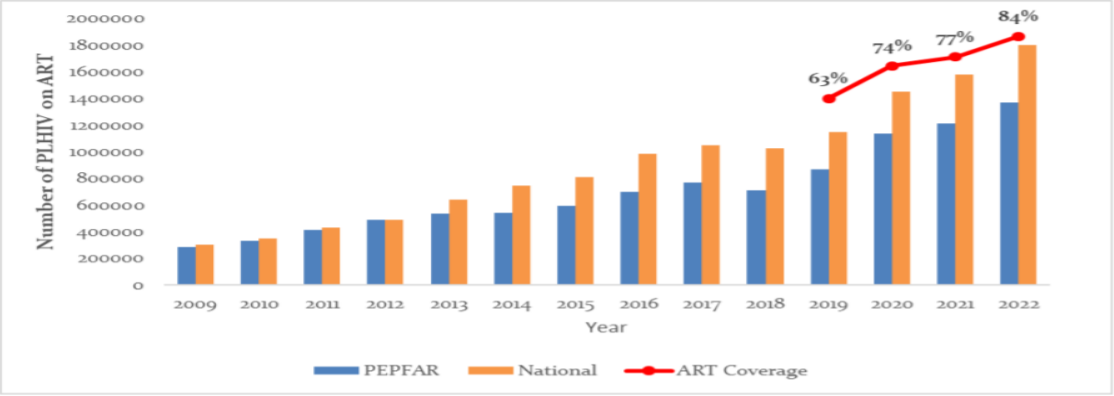
Year	Men%	Women%
2016	46.9	53.1
2017	44.5	55.5
2018	44.17	55.83
2019	43.97	56.03

from 53.1% in 2016 to 56.03% in 2019, while that of men decreased from 46.9% in 2016 to 43.97% 2019 during the same period.

Despite the increase in infection rates among women within this period, increased the use of antiretroviral treatment by them declined (Adebowale, 2021). The year 2020 USPEPA report showed that about 84% of PLHIV in Nigeria are currently in treatment (See Figure 10). No data shows the percentage of those with virally suppressed HIV Viral Load (Avert, 2020a; Mosugu, 2021).

Figure 10

Nigeria National and PEPFAR Current on Treatment Numbers



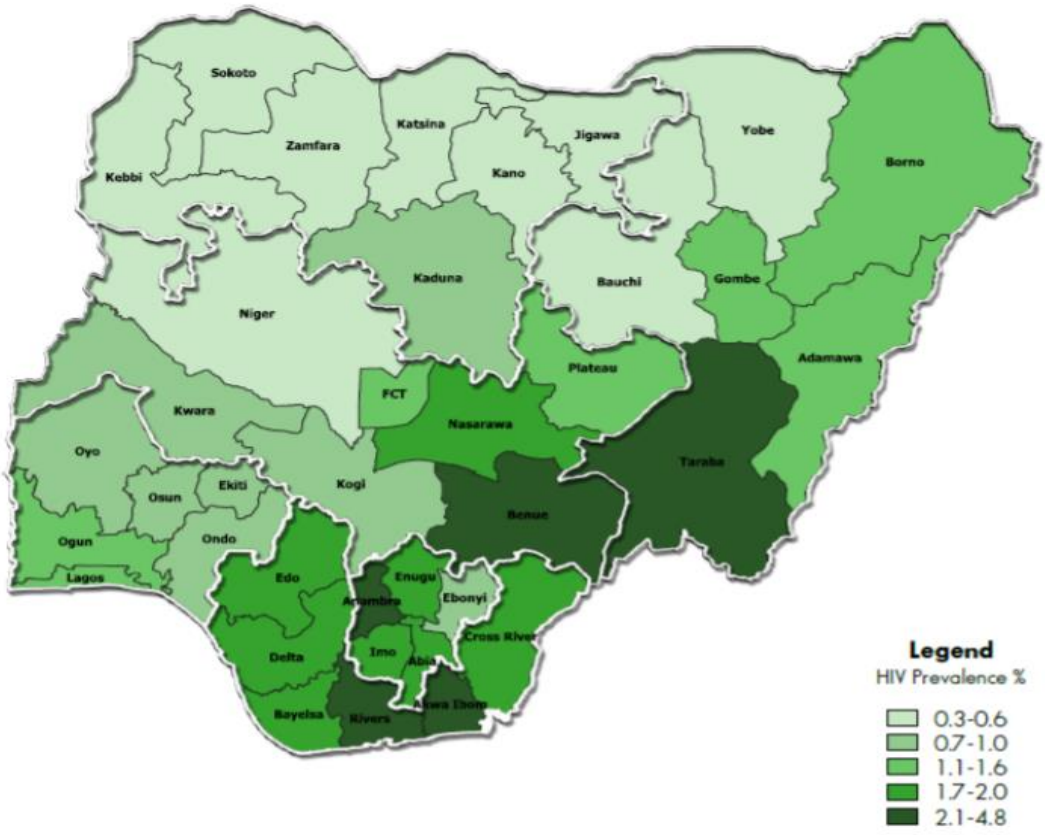
From, Nigeria Country Operational Plan (COP) 2020 Strategic Direction Summary Released March 18, 2020," by United States President's Emergency Plan for AIDS Relief, p.12 (https://www.state.gov/wp-content/uploads/2020/07/COP-2020-Nigeria-SDS-Final-.pdf.

The SS of Nigeria's geopolitical region has the highest HIV prevalence (see Figure 11, Table 2, and Table 3). Data from the 2018 Nigeria HIV/AIDS Indicator and

Impact Survey (NAIIS), a national household-based survey that assessed the prevalence of HIV and other health-related indicators, reflected this fact (Adedokun et al., 2020; UNAIDS, 2019; NACA, 2021b).

Figure 11

A Map of Nigeria Showing HIV Prevalence in Nigeria by States



From Nigeria Country Operational Plan (COP) 2020 Strategic Direction Summary Released March 18, 2020, by United States President's Emergency Plan for AIDS Relief, p. 10 (https://www.state.gov/wp-content/uploads/2020/07/COP-2020-Nigeria-SDS-Final-.pdf

Table 2

Prevalence of HIV in Nigeria's 36 States

States	HIV Prevalence %
Akwa Ibom	5.54
Benue	5.3
Rivers	3.8
Taraba	2.9
Anambra	2.4
Abia	2.1
Cross River	2.0
Enugu	2.0
Nassarawa	2.0
Bayelsa	1.9
Delta	1.9
Edo	1.9
Imo	1.8
Ogun	1.6
Plateau	1.6
Federal Capital Territory	1.6
Lagos	1.4
Gombe	1.3
Adamawa	1.2
Borno	1.2
Kano	0.6
Kebbi	0.6
Bauchi	0.5
Zamfara	0.5
Sokoto	0.4
Yobe	0.4
Jigawa	0.3
Katsina	0.3
Kaduna	1.1
Ondo	1.1
Kwara	1.0
Kogi	0.9
Osun	0.9
Oyo	0.9
Ebonyi	0.8
Ekiti	0.8
Niger	0.7

From How Nigeria's 36 States Fare in HIV Prevalence, by Nike Adebowale, 2019 March 19, Premium Times, Nigeria. (https://www.premiumtimesng.com/health/health-news/321036-how-nigerias-36-states-fare-in-hiv-prevalence.htm). Copyrighted 2020 by The Premium Times, Nigeria. Reprinted with permission.

Table 3

Prevalence of HIV in Nigeria's 6 Geopolitical Zones

Zones	HIV Prevalence (%)
South-South	3.1
North-Central	2.1
South-East	1.9
South West	1.2
North-East	1.1
North-West	0.6

From How Nigeria's 36 States Fare in HIV Prevalence, by Nike Adebowale, 2019 March 19, Premium Times, Nigeria. (https://www.premiumtimesng.com/health/health-news/321036-how-nigerias-36-states-fare-in-hiv-prevalence.htm). Copyrighted 2020 by The Premium Times, Nigeria.

HIV in South-South Nigeria

The States in this Region are Bayelsa State, Cross River State, Delta State, Edo State, and Rivers State (See Figure 1; Adedokun et al., 2020; NACA, 2021b; NACA, 2019; Oladapo, 2009; Oyelere, 2007). The States in the South-South geopolitical zone of Nigeria, of which AKS is a part, have the highest HIV prevalence of 3.1%, according to preliminary findings from the 2018 National AIDS Indicator and Impact Survey (Adedokun et al., 2020; See Table 3). Of the states in the SS region, the prevalence rate of HIV for AKS was 5.6%; Bayelsa State 1.8%; Delta State 1.9%; Edo State 1.8%, and

Rivers State 3.8 based on the fieldwork conducted between July and December 2018 (See Table 2) (Adebowale, 2019; NACA, 2021c).

Akwa Ibom State Demographics

AKS, created in 1987 from Cross River State, is the largest producer of crude oil in Nigeria and is of primary economic importance in the country (AKS Government [AKSG], 2022). The State is one of Nigeria's 36 States and situates between Latitudes 4^0 32' and 5^0 33 N and Longitudes 7^0 35' and 8^0 25' E (Enete & Okon, 2010). On the East, the state shares a boundary with Rivers State, the West with Cross River State, the North with Abia State, and the South with the Gulf of Guinea (AKSG, 2022). With a landmass of 6,900 Km^2 (Nigerian Investment Promotion Commission [NIPC], 2020), AKS is divided into 31 LGAs for administrative purposes, with Uyo as the State capital (See Figure 4) (AKSG, 2022) and 329 political wards (Adedokun et al., 2020).

AKS, according to AKSG (2022), is reputed to be the first settlers in present-day South Eastern Nigeria, is culturally homogenous with a common identity, and three major dialectal groups are Ibibio, Annang, and Oron. Other subgroups include Eket, Ibeno, Itu Mbonuso, and the Andonis, with English as the language of government and business (AKSG, 2022). According to Adedokun et al. (2020) and AKSG (2022), the projected population for AKS for 2016 was 5,482,177, derived from the 2006 population census. The projected population for AKS for 2020 was 5,867,932 (Males- 2,992,645 and females- 2,875,287) derived from the 2006 population census (NIPC, 2020).

HIV in Akwa Ibom State

According to the AKSMED (2013), 1,861 pregnant women tested positive for HIV in 2012, while 2,306 men and 4,440 females, excluding pregnant women, were HIV positive in the same year. The estimated number of deaths from HIV/AIDS in 2012 was 170.2 per 100,000 population (NBS, 2018). With the second highest prevalence rate amongst pregnant women in the country and an HIV prevalence of 10.9%, the estimated number of HIV-positive pregnant women in Akwa Ibom was 24,605 (out of the estimated 241,296 women who were pregnant) in 2012. Only 7% of HIV-positive pregnant women received ARVs for PMTCT in 2012 (AKSMOH, 2022; UNAIDS, 2013).

Akwa Ibom State as One of 12+1 HIV High Burden States

Based on the above scary details, AKS was designated by the FGN among the 12+1 HIV high burden States, with prioritization for accelerated HIV response because of the challenges associated with reducing new infections and improving health outcomes in 2012 (AKSMOH, FHI 360 and UNAIDS, 2013; US Mission, 2017; USPEFAR, 2020). Several NGOs and government agencies teamed up to help decrease this high HIV prevalence rate and strengthen the systems to provide increased and improved health services, equitable services, and interventions to address the HIV burden in the AKS health management emergency. They also provided adequate skills, strengthened management, and an enabling environment for service providers, which are critical to reducing the burden of HIV. AKS became the third project for PLAN-Health funded by USAID and the PEPFAR and implemented by Management Science for Health in 2012 (Management Sciences for Health, 2022).

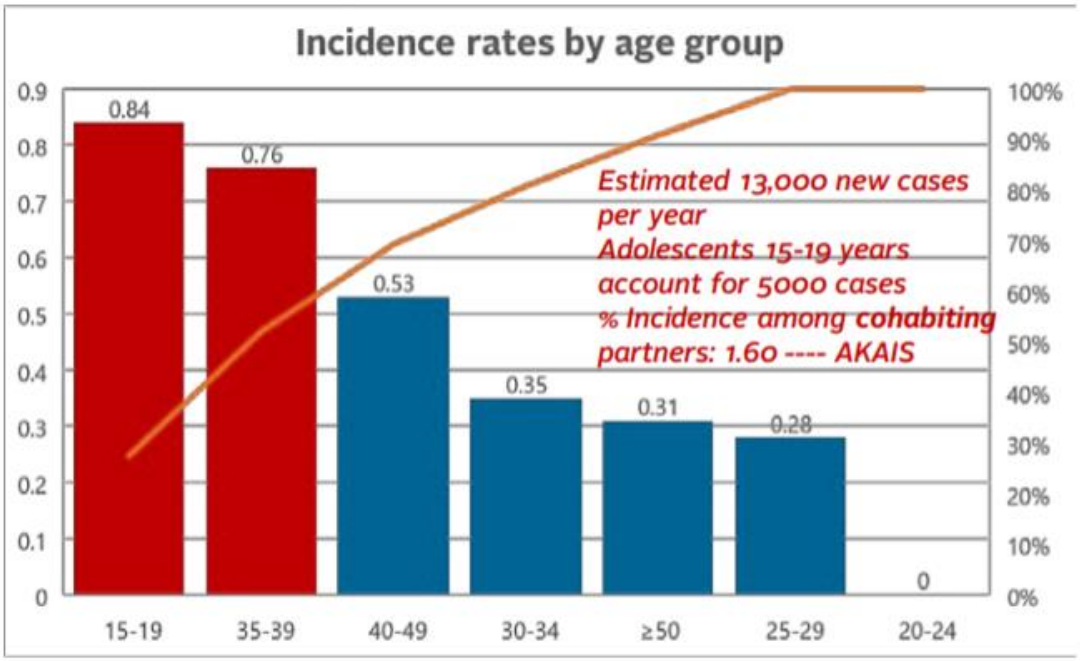
Current State of HIV in Akwa Ibom State

Despite measures to curb the spread of HIV in AKS, for 2015, NBS data showed that about 108,442 males and 110,852 females were diagnosed with HIV/AIDS, while the number was 111,777 males and 115,251 females in 2016 (NBS, 2019). According to NBS (2018), in 2016, the number of documented HIV-positive patients with access to ART in AKS was 25, 382 (M = 8, 410; F = 16, 972) despite a recorded number of 227,028 infections (M = 111,777; F = 115, 251). The Akwa Ibom AIDS Indicator Survey, a population state-level representative survey performed to generate population-based HIV estimates to inform the State's HIV program response (Adedokun et al., 2020; Badru et al., 2020), showed that of the 15,609 people surveyed (8,963 ≥15 years and 6,646 respondents less than 15 years from 4,313 households, participated in AKAIS. Overall, 423 persons (2.8%) were HIV positive (422 HIV-1 and 1 HIV-2). For 0–9 years, the prevalence was 0.4% (0.2% urban areas and 0.4% rural areas); for adolescents 10–14 years, it was 0.6% (0.0% urban area and 0.9% rural area), and the prevalence was significantly higher in females (5.6%) than males (3.7%) aged 15 years and older with overall HIV prevalence in the age category of 4.8%. The prevalence of HIV was high in rural areas (5.1%) compared to about 3.9% in urban areas (females [5.6%] and males [3.7%]). For those adults who had been previously married, the prevalence was the highest at 7.0%. HIV prevalence was 4.8%, 3.4%, and 3.1% among married, cohabiting, and never married adults. Those who have ever had sex had a higher prevalence. Among 15 years and older, the incidence rate was 0.41% which translated to 13,000 new cases of HIV infections annually in persons 15 years and older in Akwa Ibom (Adedokun et al.,

2020). The HIV incidence rates in females and males were similar at 0.41% and 0.42%, respectively. Among the age group 15–19 years, HIV incidence was 0.84% or 5,000 estimated new infections, accounting for almost half of all new infections in 15 years and older. Males 15 - 19 years have a higher incidence rate of 1.46% than females, with 0.96% (Adedokun et al., 2020; See Figure 12).

Figure 12

Incidence Rate by Age Group

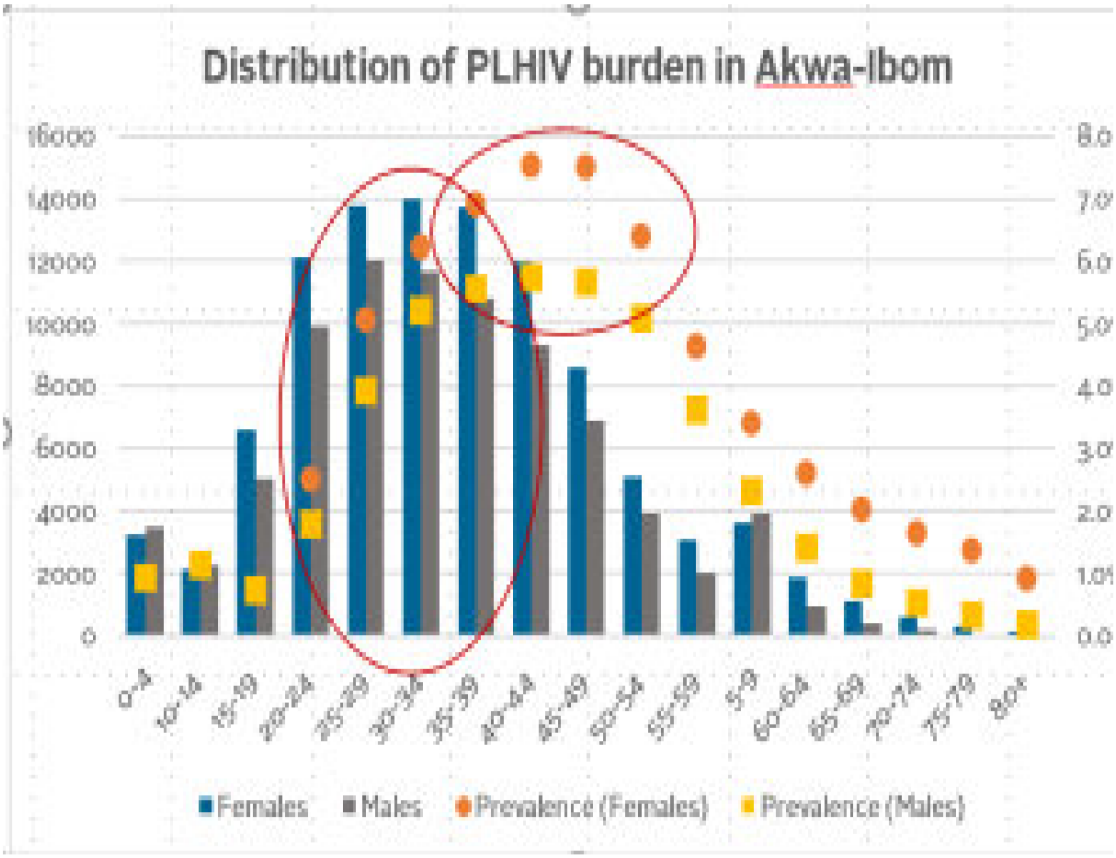


From "Implementing the surge HIV response in Akwa Ibom: An accelerated HIV epidemic control drive -Technical brief-2019 by FHI, 2019," (https://www.fhi360.org/sites/default/files/media/documents/resource-nigeria-hiv-surge-hiv-response.pdf

The estimated burden of PLHIV in AKS in 2019 is shown in Figure 13, and according to Data for Information (2020), the 2018 NAIIS showed a prevalence rate of 5.5% with an estimated burden of 178,000 PLHIV in AKS (Table 2).

Figure 13

Distribution of PHHIV Burden in Akwa Ibom



From Implementing the surge HIV response in Akwa Ibom: An accelerated HIV epidemic control drive -Technical brief-2019 by FHI, 2019, (https://www.fhi360.org/sites/default/files/media/documents/resource-nigeria-hiv-surge-hiv-response.pdf)

An estimated 120,000 PLHIV had an unmet need for life-saving ART in 2019 (Adedokun et al., 2020; FHI, 2019). This level is higher than the average of 1.4% (Adedokun et al., 2020) obtained from the July and December 2018 national survey results (NACA, 2021b). Therefore, there is a need to institute measures to address this disproportionate perpetuation of the HIV epidemic and the unmet need for ART to justify investments in HIV response programs.

The focus of interventions is to achieve treatment saturation for 120,000 of the 178,000 PLHIV with an unmet need for life-saving ART to close the treatment gap and drive the State towards epidemic control by the fourth quarter of 2020 (FHI, 2019). HIV/AIDS is one of Africa's leading causes of mortality and morbidity, dwarfs economic growth, and threatens human development by reducing life expectancy (Dauda, 2019). The disease also impacts numerous bodily, mental, and social issues that affect individuals, their families, and communities (All Answers, 2019) and the QoL of individuals and families. HIV/AIDS epidemic is one of the most challenging public health concerns affecting AKS This has made it a current priority in the United States President's Emergency Plan for AIDS Relief for intensified HIV prevention and care surge activities to achieve epidemic control (Adedokun et al., 2020).

The AKS AIDS Indicator Survey (AKAIS), a State-level representative survey, generated population-based HIV estimates to inform the HIV program response in AKS. The report from this AKAIS served some practical purposes (Adedokun et al., 2020; FHI, 2019) by providing evidence on the burden of HIV in AKS and guidance on implementing the scale-up of treatment and prevention services (See Figure 14). Current

and future program evaluations could use such information as a baseline or a reference scale. The social and demographic landscape and disproportionate burden of HIV in AKS come with challenges and opportunities within the HIV prevention and care systems to meet the medical and support service needs of PLHIV in the state.

Effects of HIV on the Population

HIV is one critical health issue undermining developmental efforts by affecting women and men in Nigeria and afflicts populations already beset by extreme poverty (NBS 2021). According to Avert (2020b), the global HIV epidemic has disproportionately affected women worldwide since its discovery, and even presently, more than half of PLHIV are women. Among women 15 to 49 years of age, AIDS-related illnesses related to AIDSs are the leading causes of death (Avert, 2020b). Where HIV affects all groups, young women between the age of 15 to 24 years, according to Avert (2022b), are more likely than their male counterparts to have HIV in almost all countries.

HIV affects the working population and stymied economic progress (NBS, 2021). The disease prevents women and men from making meaningful economic contributions to the community while impacting the structure of families (NBS, 2021). At the household level, the epidemic increases the burden of care and erodes savings (NBS, 2021). Human rights barriers— including stigma and discrimination, violence and other abuses, negative social attitude, and legal obstacles—contribute to vulnerability to HIV among key populations (UNAIDS, 2018). Women and girls have limited access to HIV prevention, testing, treatment, and care services (UNAIDS, 2018).

Despite effective interventions to decrease the rate of new HIV infection in the population, threats toward progress exist among vulnerable populations. These populations are injection drug users, people without knowledge of their HIV status, or PLHIV not linked to care (HIV.gov, 2021a). Others are the stigma that still tragically surrounds HIV, resulting in a debilitating barrier that prevents PLHIV from receiving the health care, services, and respect they need and deserves (See Figure 13). Responding to HIV is challenging biomedically and socially because of the impact of undiagnosed and untreated HIV in the nation and the critical need to expand treatment (HIV.gov, 2021a).

Response to HIV Infection

In the African continent, HIV remains a public health challenge (Gombachika et al., 2012), and addressing the patient's HIV care engagement will require a better understanding of the facilitators and barriers to retention and re-engagement (Berger et al., 2016). Improving patient engagement should be a national priority, with targeted retention measures established to actualize it (Berger et al., 2016). RHIVC contributes to ARTA, which is critical for improved treatment outcomes and the prevention of drug resistance (Muwanguzi et al., 2021). MA and CR come with benefits such as suppressing HIV replication, thereby increasing CD4 cell count and delaying the clinical progression of AIDS infection. Adherence and CR will increase the number of PLHIV due to decreased mortality, making HIV a chronic illness rather than an epidemic. It will also encourage PLHIV receiving treatment to reconsider their reproductive decisions, such as getting married and having children (Gombachika et al., 2012).

Several challenges make HIV control a complicated endeavor (KFF, 2021). These challenges include the lack of a cure and reduced access to prevention, treatment, and care for the many PLHIV or at risk for HIV infection (KFF, 2021) and the retention of patients under the care umbrella (Sahay et al., 2011). Though HIV infection primarily affects the health of individuals, households, communities, and the nation are affected since most PLHIV are in their productive years and cannot meaningfully contribute to economic growth and development (KFF, 2021). The disease opens up and exposes developing countries to challenges from other infectious diseases, food insecurity, and other global health and development problems that are rampant in these countries (KFF, 2021).

Even though the fight against HIV has seen significant progress, the gains are unevenly spread among all regions and continents (KFF, 2021; FHI, 2019). The UNAIDS' 2020 targets of 90-90-90 were missed (KFF, 2021) and now revised to the 2030 target of 95-95-95; thus, HIV continues to pose serious public health threats in all regions (WHO Regional Office for Africa [WHOROA], 2017). Sub-Saharan Africa, home to about 13.4% of the world's population, has many HIV/AIDS infections, which is concerning from a public health perspective and a cause of death for many (WHOROA, 2017). This region accounts for an estimated 69% of all PLHIV (PLHIV) and 70% of all AIDS deaths in 2014 (WHOROA, 2017). Responding to HIV infection should involve leveraging critical scientific advances in HIV prevention, diagnosis, treatment, and outbreak response by coordinating highly successful programs, resources, and infrastructure (HIV.gov, 2021a).

At the regional level, in 2013, African Heads of State and Government, through the Abuja +12 declaration, had tasked member States to eliminate HIV and AIDS in Africa by 2030 (African Union [AU], 2013). The 2013 document laid out the framework to accelerate HIV prevention and treatment interventions in Africa. Part of the framework was the need to increase the allocation of domestic resources to scale up intervention against HIV/AIDS in the continent (AU, 2013).

In 2015, the United Nations (UN) replaced the Millennium Development Goal (MDGs) with the Sustainable Development Goal (SDG), setting 2030 as the target year for ending the AIDS epidemic as a public health threat (Avert, 2021b). The SDG informed the Fast Track Response Strategy (FTS) launched by UNAIDS in partnership with other organizations in 2014 (Avert, 2021b; UNAIDS, 2015). Under the FTS, the concept of ending AIDS as a public health threat using standardized epidemiologic guidelines means a 90% reduction in HIV incidence and mortality by 2030 (Avert, 2021b; DeLay et al., 2021).

Ending the HIV Epidemic

According to HIV.gov (2021b), to end the HIV epidemic, the focus should be on diagnoses, treatment, prevention, and responding to new threats, which are strategies that, implemented together, can make a difference. This initiative should involve the infusion of additional resources, expertise, and technology to develop and implement locally tailored plans in areas and specific populations where HIV transmission occurs most frequently (HIV.gov, 2021b; UNAIDS, 2015). Early diagnosis and entry into the HTC have significant individual and public health benefits. Early initiation of treatment is

better for a person's health, is cost-effective, increases life expectancy, and decreases the likelihood of onward transmission to others (Bedert et al., 2021).

According to KFF (2021), documented evidence supports the notion that engagement in HIV treatment improves individual health outcomes and significantly reduces the risk of transmission. Ending the HIV epidemic in 2030 will involve a mix of interventions that can reduce this gap in service delivery and ensure that most patients are initiated on therapy, remain on therapy, and achieve VLS in line with the UNAIDS laid out targets (FHI, 2019). Undoubtedly, salient barriers and facilitators to engagement in care vary across settings and individuals, and clarifying these context-specific factors within a state and regional HIV care systems can inform efforts to reduce health disparities and improve public health (Berger et al., 2016).

The HTC as a Framework of HIV Management

The HTC as a public health model and framework, according to Avert (2021a), HIV.gov (2021b), and Kay et al. (2016), is a useful HIV management tool. The treatment cascade drives care in the whole spectrum of the care continuum by outlining the steps or stages that people with HIV should go through, from the initial diagnosis to achieving and maintaining a very low or undetectable amount of HIV in the body. When the HTC is used as a guideline and followed strictly by PLHIV, it prevents the emergence of HIV drug-resistant strain and infection resurgence (Avert, 2021a; Kay et al., 2016). The WHO treat-all policy recommends that everyone living with HIV or testing positive for the virus be treated as soon as possible through entry into the treatment cascade to limit disease progression (Avert, 2021a). Barriers to MA are many and exist in both developed

and developing countries. According to Achappa et al. (2013), it is crucial to identify factors that lead to non-adherence and develop strategies to improve long-term adherence.

The HTC continuum has 5 main steps: Diagnosis step, LC step, RIC step, Adherence to ART, and VS Step (Avert, 2021a; Kay et al., 2016). Although presented linearly and as a unidirectional framework for care, a PLHIV can get into and experience care within the HTC continuum in a less streamlined fashion, skip steps altogether or even drop out for a while and regress to an earlier stage (Kay et al., 2016). HTC is necessary to maintain VS, preserve immune function, and stop HIV progression. The low adoption of HTC among young people stifles public health efforts to combat the surge of HIV, leading to undiagnosed new infections and continuous perpetration of the virus in the population (Sakala et al., 2020).

Steps of the HIV Cascade

Testing and Diagnosis

Diagnosis is the initial step and the gateway into the HIV Cascade (Avert, 2021a). As an entry point to the needed care for PLHIV, awareness of the positive test result occurs at this point (Avert, 2021a; HIV.gov. 2021a; Kay et al., 2016). When viewed worldwide, there is a variation in the reported diagnosis rate between countries and regions. While about 81% of all PLHIV were diagnosed in 2019 worldwide, for West and Central Africa, the diagnosis rate was only 68%, and only 52% in the Middle East and North Africa (Avert, 2021b). Improvement has occurred at the diagnosis level, with a shift from people seeking HIV testing themselves (opt-in testing) to offering HIV testing

along with other services with an option to decline (opt-out) (Avert, 2021b). Some identified barriers to HIV testing include the fear of a positive result, poor communication in relationships and families, cultural norms, and lack of youth-friendly HIV testing services. Perceived susceptibility to infection, partner support, availability of community-level youth clubs or support groups, and the provision of HTS through outreach clinics were key facilitators for HIV testing (Sakala et al., 2020).

Linking to HIV Care

The second stage of the framework is LC. This stage is crucial for strengthening the treatment cascade (Avert, 2021b; HIV.gov., 2021a; Kay et al., 2016). Promoting linkages implies that services that offer HIV testing should be near those offering immediate ART treatment to those diagnosed (Avert, 2021b; & HIV.gov., 2021a). According to the CDC, the timeline of LC should be 30 days, and this requires that the person diagnosed with HIV visit a healthcare provider within this time frame of learning about the diagnosis.

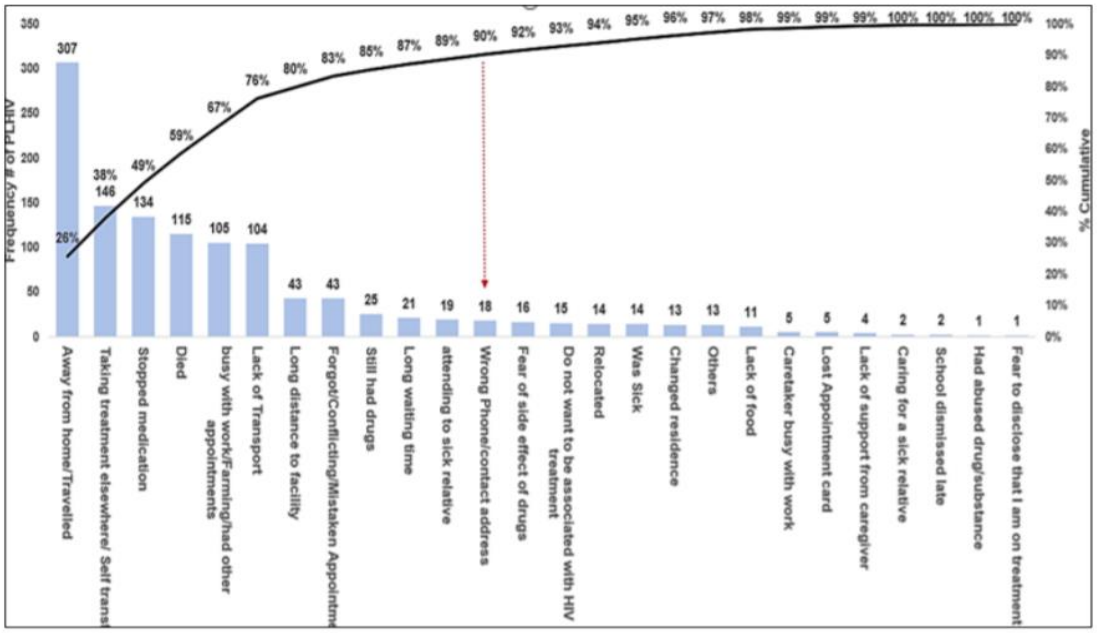
Keeping people in care

Keeping people diagnosed with HIV fully engaged and committed to their care is challenging because of the varied factors that come into play (Figure 14). According to Avert (2021b), these influencing factors are barriers that discourage or prevent people from engaging with healthcare services. Barriers that could negatively affect CR include stigma, distrust of health services, concerns about confidentiality, and the time and cost of transport to a clinic (Avert, 2021b).

Avert (2021b) also identified loss of income due to healthcare appointments, clinic waiting times, lack of support from partners and family, and other personal priorities, though not exclusive, as ongoing threats to CR. On average, 6% to 34% of people will still be in care one year after starting treatment. WHO opines that most PLHIV who leave care do so in the first few years of starting treatment (Avert, 2021b). Providing people-oriented services strengthens this stage of the cascade by organizing programs around the health needs and preferences of PLHIV (Avert, 2021b).

Figure 14

Impediments to HIV Care



From Nigeria country operational plan (COP) 2020 Strategic Direction Summary released March 18, 2020 by United States President's Emergency Plan for AIDS Relief, p. 16 (https://www.state.gov/wp-content/uploads/2020/07/COP-2020-Nigeria-SDS-Final-.pdf

There is a lack of consensus on how best to measure retention or continuity, according to Kay et al. (2016). Kay et al. explained that any retention measure should include at least two indicators: appointments kept, and appointments missed because of their complementary roles. Kay et al. asserted that missed appointments are associated with higher viral loads and lower CD4 counts, and the number of missed medical appointments should be a significant predictor when measuring clinical outcomes.

Adherence

Measuring adherence is challenging when reliance solely depends on patient self-report with no standard indicator for confirming consistency with ART medication or medication counts (Kay et al., 2016). The standard HIV care model with ARTA after the retention stage gives no account of or represents other entry points into a leaky continuum, wherein the loss of PLHIV can occur at each step. The traditional HTC continuum model, according to Kay et al. (2016), does not explain or reflect the experiences of PLHIV that engaged in care after dropping out for some time or even waiting until their symptoms have become unmanageable to begin ART. The care-seeking behavior of a PLHIV may be intermittent, rendering the traditional cascade model too simplistic as an individual-level monitoring tool (Kay et al., 2016).

Individual factors affecting adherence are not limited to changes in daily routines or mental health conditions like depression. Factors arising from the medications, like the complexity of the medication regimen or medication side effects, could play a role. Healthcare-related non-adherence facilitators include the frequency of medication refills

and financial stress, specifically among the low-income group when copays or payments out-of-pocket are required (Avert, 2021b).

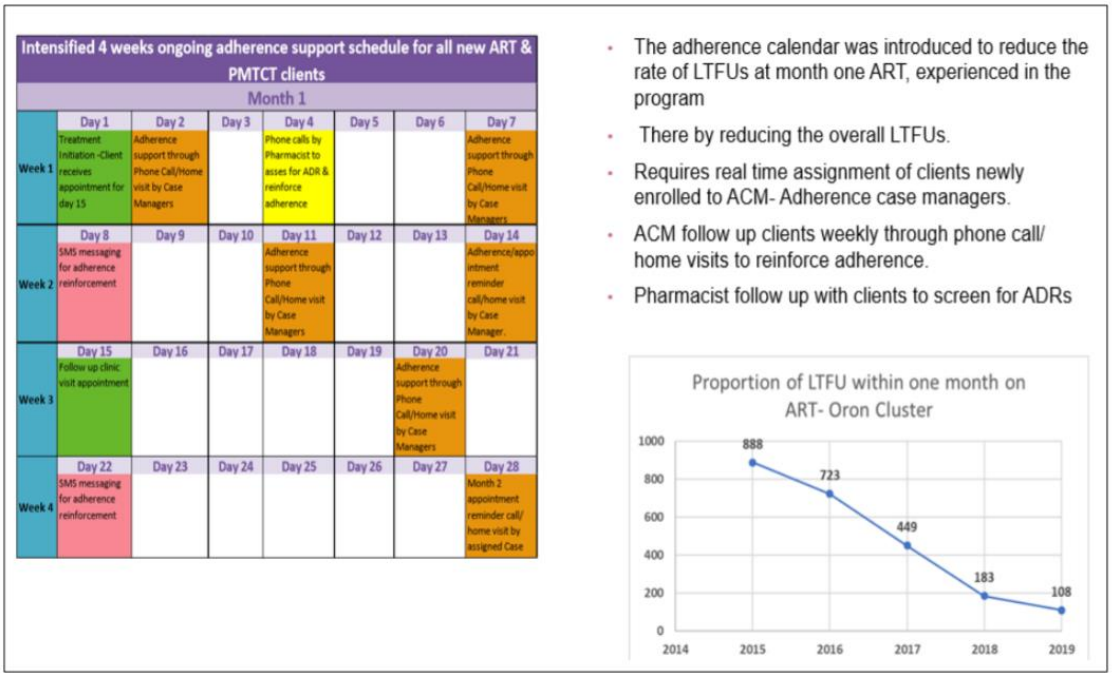
To address challenges posed by non-adherence to ART, which recommends the use of peer counselor support, the use of mobile devices for text messages as a form of support, the use of available reminder devices such as alarms, the application of cognitive-behavioral therapy, behavioral skills training, and MA training (Avert, 2021b). Also recommended is changing the medication regimen to a more uncomplicated one, such as once-a-day regimens that combine several drugs in one pill (Avert, 2021b). Intervention may also include improving the supply chain process for ART medication in the health system to address the problem of running short of medication supplies (out of stock) and ensuring privacy and confidentiality (Avert, 2021b).

Drug-resistant HIV strains can develop when individuals fail to adhere to drug therapy or regimen because they deviate from their treatment plan (Avert, 2021b). Ten percent of PLHIV started on ART in six of the eleven high-prevalence countries in Africa, Asia, and Latin America surveyed by WHO in 2017 had drug-resistant HIV (Avert, 2021b). If not checked or curtailed, this trend could lead to over 135,000 deaths and 105,000 new infections by drug-resistant HIV strains in the next 5 years.

Economically allowing the drug-resistant strain of the virus to develop, according to Avert (2021b), would add about US$ 650 million to an already high HIV treatment cost. The use of an adherence calendar could be a helpful program for monitoring adherence (see Figure 15).

Figure 15

HIV Adherence Calendar



From Nigeria country operational plan (COP) 2020 Strategic Direction Summary released March 18, 2020 by United States President's Emergency Plan for AIDS Relief, p. 18 (https://www.state.gov/wp-content/uploads/2020/07/COP-2020-Nigeria-SDS-Final-.pdf

Viral suppression

VS is the last stage in the HTC and the ultimate aim and goal of HIV treatment and management. VS means an undetectable level of the virus in the individual's blood. VS is beneficial only when there is a continuous suppressed level of the virus, leading to continued good health and prevention of HIV transmission to others (Avert, 2021b). Knowing the virological suppression status of PLHIV on ART helps detect early

treatment failures and supports PLHIV, who needs more intensive adherence counseling (Isaac et al., 2021). Adherence and CR will minimize the development of a drug-resistant strain of HIV, which could lead to a switch to a more potent, expensive drug and limited options for ART (Isaac et al., 2021).

Variations exist in the number a PLHIV must attain to be certified as virally suppressed clinically. Kay et al. (2016) stated that in the USA, VS is a recent measurement within the past year of fewer than 200 copies per milliliter (c/mL) (in the USA). At the same time, 50 c/mL is the quantity in Australia. This lack of consensus on the cut-off point makes comparison difficult (Kay et al., 2016). VS is not constant once achieved if not maintained. The patients can always transition between suppressed and non-suppressed states, even over periods as short as one year (Kay et al., 2016). Concerted efforts have to be made by PLHIV to sustain the goal of VS, while at the same time, viral load monitoring should be made accessible (Avert, 2021b).

Medication Adherence

In 2016, the WHO recommended that lifelong ART be made available to everyone living with HIV, including children, adolescents, adults, and pregnant and breastfeeding women, regardless of clinical status or CD4 cell count (WHO, 2021). MA is a critical component for the optimum benefit of ART therapy in PLHIV (Kim et al., 2018) and is one of the critical determinants of HIV disease progression. As a multifactorial phenomenon, MA is a critical component for deriving the maximum benefit of ART therapy in PLHIV. Gast and Mathes (2019) described how a patient's behavior corresponds with the prescribed medication regarding dosing regimens, such as

time, dosing, and interval of medication intake, which are essential in optimizing therapeutic response. The process involves choosing, starting, managing, and maintaining a medication regimen prescribed to treat HIV infection (Fong, n.d.). Incomplete or lack of adherence compromises treatment effectiveness leading to an unsuppressed virus with the potential for developing HIV drug resistance (Chen et al., 2017). According to Kim et al. (2018), to reach the desired level of clinical benefit, PLHIV should receive continuous medication.

Factors Affecting Medication Adherence

Factors affecting MA could be the patient's social situation, clinical condition, the prescribed regimen, and the patient-provider relationship (NIH's Office of AIDS Research, 2021). Behavioral, structural, and psychosocial barriers such as denial stigma could also be a factor. Other factors are access to medications caused by finance, poor roads, and transportation. Active substance use, Low health literacy, homelessness, low levels of social support, poverty, stressful life events, unstructured routine, poverty, and non-disclosure of HIV-positive status also play some parts (NIH Office of AIDS Research, 2021). A side effect, a characteristic of one or more components of the prescribed regimen, can affect adherence. Among the structural factors that influence the success or failure of MA are the characteristics of the clinical setting.

In AKS, FHI (2019) identified low HIV risk perception among the populace and poor access to available ART services due to the rugged geographic terrain in parts of the State. Furthermore, high-risk sexual behavior, especially among young people and entrenched socio-cultural practices, religious and superstitious beliefs about HIV/AIDS

adversely affect the health-seeking behavior of the population, constituting a significant barrier to access to care. According to the NIH Office of AIDS Research (2021), HIV care settings should provide multidisciplinary care support to patients' complex needs, including MA-related needs. Services within these settings include case managers, pharmacists, social workers, and mental health and substance abuse providers to meet these needs.

Benefits of Medication Adherence

The PLHIV's response to ART is a factor of treatment adherence, making treatment adherence a critical component for optimizing the patient's response to therapy (Fong, n.d). However, ART benefits are achieved through long-term MA, making it an important determinant of HIV disease progression (Chen et al., 2017). According to Kim et al. (2018), there is a relationship between viral load, which should be maintained at 95% or above, and MA rate because they are needed to optimize ART outcomes. When MA is at 95%, the VS rate approaches 78%, but when the adherence rate drops to 80%, the VS rate will dip to a level as low as 20% (Kim et al., 2018). Early ART, according to Cohen et al. (2011) in their study, supported the use of ART as a part of a public health strategy to reduce the spread of HIV-1 infection since it has clinical benefits for HIV-infected persons and their uninfected sexual partners.

Treatment failures in PLHIV are usually due to low concentrations of ART in the blood, a risk factor for developing drug-resistant HIV strain, and a recipe for transmission to others (Kim et al., 2018). Poor MA could endanger an individual’s health due to treatment difficulties, and also increases the potential of infection transmission with

detectable viral loads, leading to severe public health problems (Kim et al., 2018). Reaching a success level with HIV management will include optimizing adherence in PLHIV with an accurate evaluation MA.

Similarly, care providers should identify factors associated with adherence to intervene promptly, predict prognosis, and facilitate and maintain the optimum effects of antiviral therapy (Kim et al., 2018). Since WHO recommends a rapid ART initiation to all PLHIV, including offering ART on the same day as a diagnosis among those who are ready to start treatment, about 28.2 million people globally living with HIV will receive ART in 2021, with a coverage rate of 73% (WHO, 2022b). In children 0-15 years, 54% were on treatment. In adults 15 years and over, it was 74%. Worldwide, 68% of men were in treatment, while 79% of Females were. In Africa, 76% were on treatment (M=70% and F 83%). East and South Africa had 76% (72% males and 83% females), and West Africa had 70 % (64% males and 0% females) (WHO, 2022b).

For Nigeria, there is gradual progress towards achieving the 90-90-90 goals. The NAIIS data shows that 67% of all PLHIVs know their status, 63% are on HIV treatment, and 54% are virally suppressed (USPEFAR, 2020). Rivers 142,394 and AKS 111,193 have the most ART unmet needs in Nigeria. Out of an estimated 1,832,266 PLHIV in Nigeria in 2019, approximately 1,146,643 were on treatment at the end of 2019. The number suggests that about 63% of the estimated number of PLHIV in the country are in treatment. Based on the Country Operational Plan (COP), by the end of 2022, the country is expected to have about 1,801,359 people in treatment, raising the national treatment coverage to about 84%. The NAIIS estimated that 29.2% of PLHIV aged 15-64 years

were aware of their status nationally. Of those, 88.4% were on ART, and 83.1% reached VS levels. The population with VLS among all PLHIV aged 15-64 years was estimated nationally at 44.5% (46.2% among females and 40.9% among males). This variation seen between the sexes, across states, and age groups highlights the issues with health-seeking behavior. In most LGAs of AKS, there are high numbers of PLHIV who are not on treatment (i.e., high unmet treatment need; United States Agency for International Development [USAID], 2020). These LGAs also have lower levels of testing, leading to fewer people testing for HIV and being identified and put on treatment (see Table 4).

Table 4

HIV Testing, Treatment, and Viral Load Monitoring in AKS by LGA

HIV testing, treatment and viral load monitoring in Akwa Ibom State, by LGA

LGA	PLHIV	Prevalence	HTS_TST	HTS_TST_POS	TX_CURR	TX_PVLS_D	TX_PVLS_N	VL_Suppression %	VL_Coverage &	Unmet need
Abak LGA	5578	5	1933	67	2058	1382	1244	90	67	3520
Eastern Obolo LGA	2123	5	303	7	410	37	32	87	9	1713
Eket LGA	8040	6	1927	31	6790	4151	3480	84	61	1250
Esit Eket LGA	3352	6	2140	415	1171	405	331	82	35	2181
Essien Udim LGA	5840	4	1409	63	3556	2062	1752	85	58	2284
Etim Ekpo LGA	3460	5	1013	65	1735	1068	907	85	62	1725
Etinan LGA	7223	5	1485	40	2740	2025	1731	86	74	4483
Ibeno LGA	3209	6	826	43	1917	648	516	80	34	1292
Ibesikpo Asutan LGA	6021	5	1404	38	1800	970	800	83	54	4221
Ibiono Ibom LGA	5986	4	1788	50	2183	1405	1136	81	64	3803
Ika LGA	1960	4	720	25	440	132	121	92	30	1520
Ikono LGA	4164	4	1056	34	969	481	410	85	50	3195
Ikot Abasi LGA	6460	5	908	15	2269	1303	1121	86	57	4191
Ikot Ekpene LGA	5232	4	2205	88	4940	3826	3420	89	77	292
Ini LGA	2106	2	685	20	683	212	175	83	31	1423
Itu LGA	4223	4	1046	37	1314	572	484	85	44	2909
Mbo LGA	4835	6	1707	34	4787	2213	1762	80	46	48
Mkpat Enin LGA	7894	5	504	16	1133	421	328	78	37	6761
Nsit Atai LGA	3282	5	351	4	712	344	252	73	48	2570
Nsit Ibom LGA	4939	5	249	9	998	528	401	76	53	3941
Nsit Ubium LGA	5467	6	523	26	1076	490	388	79	46	4391
Obot Akara LGA	3374	3	492	31	1152	579	475	82	50	2222
Okobo LGA	5475	6	1037	18	3435	1891	1474	78	55	2040
Onna LGA	5521	6	746	27	1111	564	457	81	51	4410
Oron LGA	3786	5	2739	71	5567	4603	3727	81	83	-1781
Oruk Anam LGA	8170	5	934	54	2115	635	484	76	30	6055
Udung Uko LGA	1744	5	174	4	1125	285	209	73	25	619
Ukanafun LGA	6055	6	247	11	794	400	334	84	50	5261
Uruan LGA	4936	5	2255	64	2472	1551	1297	84	63	2464
Urue-Offong/Oruko LGA	3094	6	752	21	1277	504	390	77	40	1817
Uyo LGA	10790	5	12321	293	15297	12088	10850	90	79	-4507

Mind the Gap: Leveraging the National HIV/AIDS Indicator and Impact Survey (NAIIS) Data to Identify Service Delivery Gaps in Akwa Ibom State 9

From, Mind the Gap: Leveraging the National HIV/AIDS Indicator and Impact Survey (NAIIS) Data to Identify Service Delivery Gaps in Akwa Ibom State, by Data for Information (2020) (http://pdf.usaid.gov/pdf_docs/PA00XBDD.pdf).

According to USAID (2020), the current resources and programming in these LGAs are insufficient to control the epidemic, as noted above. The viral transmission will continue with low levels of ART coverage and poor treatment outcomes measured by VLS (USAID, 2020).

Care Retention

Retention as a primary determinant of treatment outcome involves an array of care packages starting from diagnosis, which is the entry point of the HIVCC to the consistent sustenance of lifelong life services (Umeokonkwo et al., 2021). The UNAIDS' 90–90-90 strategy had a goal of 90% retention of enrollees in HIV care by 2020 (Muwanguzi et al., 2021). Though RIC has no gold standard for measurement (Umeokonkwo et al., 2021), various authors such as Muwanguzi (2021) and Umeokonkwo et al. (2021) adopted a similar methodology in their respective studies. Izudi et al., as cited by Muwanguzi et al. (2021) in their research, defined RIC in the context of a patient who has made at least one HIV clinic visit within 90 days before any review date.

Umeokonkwo et al. (2021), in their study, described patients who visited the health care facility and refilled ART at least once per quarter consistently for all quarters proceeding to the date of the report as having good retention. Poor retention was inconsistent care (Umeokonkwo et al., 2021). Retention provides opportunities to monitor response to ART, making it a critical ARTA precursor, VS, and a means to prevent associated complications (Muwanguzi et al., 2021). Achieving positive outcomes

in HIV management, such as more prolonged survival, a better QoL, and reduced HIV transmission, are linked to adherence to treatment and RIC (Umeokonkwo et al., 2021).

Inconsistent treatment or poor retention in medical care among PLHIV, particularly at the initial diagnoses, predisposes to some risks, including delayed ART initiation (Moitra et al., 2021), unsuppressed viremia, suboptimal ARTA, and mortality (Moitra et al., 2021; Muwanguzi et al., 2021). Suboptimal retention means ineffective leveraging of ART to prevent onward HIV transmission (Moitra et al., 2021), leading to a worsening health outcome (Muwanguzi et al., 2021) and increased HIV-associated morbidity and poor QoL (Muwanguzi et al., 2021 & Oryokot et al., 2021). According to Oryokot et al. (2021), a 5-year impact of HIV treatment interruption can cause a 10% increment in AIDS-related deaths, while a six-month treatment interruption could increase the number of deaths by 1.63 times in one year.

Hickey et al. (2021) noted the challenge of sustaining a high level of lifelong treatment engagement due to resource limitations. In sub-Saharan Africa, for instance, Hickey and partners stated that within the first three years after initiation of therapy, about one-third of PLHIVs opt out of ART. These barriers are similar across the African region, as presented in published literature (Nalubega et al., 2021). In low and middle-income countries, those factors influencing RIC are identical to those influencing adherence to ART (Muwanguzi et al., 2021).

According to Berger et al. (2016), the social-ecological model offers a better understanding of the many barriers and facilitators that impact RIC. RHIVC, according to Berger et al. is influenced by intrapersonal, interpersonal, institutional, community, and

public policy factors. Muwanguzi et al. (2021) described these as individual, political, socioeconomic, stigma and discrimination, sociodemographic, and health system factors.

Hickey et al. (2021), Muwanguzi et al. (2021), and Oyeledun et al. (2014), in their studies, explained the diverse reasons for disengagement from care. The authors noted that psychosocial barriers are a principal reason for those who stopped treatment altogether. Other significant determinants of poor RHIVC include social, structural, or health-related factors such as distance and transport to the health facility, poverty, unemployment, work/childcare responsibilities, and social relations (Muwanguzi et al., 2021). Nalubega et al. (2021) describe barriers to RHIVC and AHIV medications as structural (e.g., transport difficulties, accessibility of healthcare facilities, and limited finances), clinical (e.g., clinic delays, harmful attitude/experience with healthcare personnel, clinic delays, and fear of drug side effects) and psychosocial (e.g., HIV stigma, disclosure, and low-income family support).

Structural drivers of HIV, according to the U.S. Department of Health & Human Services, 2011 are conceptualized as those political power, social, organizational, economic, organizational, and domination factors that contribute to social inequities. These structural drivers directly do not cause the acquisition or onward transmission of HIV but mediate lower-order risks, such as those at the individual or network levels, according to the U.S. Department of Health & Human Services (2011). Poor quality of services in health facilities and long waiting times are critical factors against RIC and discrimination (Oyeludun et al., 2014).

How to Promote Care Retention

According to Hickey et al. (2021), there is a need for interventions to prevent disengagement and promote re-engagement in HIV care whenever a break occurs. As Hickey et al. (2021) noted, in the era of test-and-treat, more hard-to-reach individuals are linked to care, which may require additional support to maintain long-term RIC. Hickey et al., 2021) posited that interventions tailored to improve psychosocial support could enhance MA and care engagement (Hickey et al., 2021). A potential source of social capital, such as an existing social relationship, can enhance support and sustain RHIVC, according to Hickey et al. (2021). Hickey also noted that group health education and facilitated HIV status disclosure reduced disengagement from HIV care. Parrish et al. (2021) reported that extending ART dispensing intervals increased the probability of retention, especially up to four months' supply. However, increasing the dispensing lengths for those already receiving ≥5-month supply of ART had a potentially damaging effect. Appropriately addressing patient HIV care engagement requires a better understanding of the facilitators and barriers to retention and re-engagement (Berger et al., 2016).

Socio-Ecological Model

The battle to slow the HIV epidemic worldwide has become more apparent with the understanding that its continuous propagation is not simply about using condoms or ATM; instead, a risk that involves a complex set of behaviors with multiple layers of influences (Kaufman et al., 2014). Individual psychological and biological factors inadequately explain disparities and risks among vulnerable groups since those risks

commonly begin at the structural level and trickle down to the community, social, and individual levels (Banks et al., 2020). Banks et al. (2020) state that these risks work in a positive feedback system, with the downstream effects compounding and influencing the structural risks. Thus, the need to consider the contextual and individual risk factors within the advanced stage of the epidemic facing this population.

In order to effectively harness the biomedical, behavioral, and structural components of HIV prevention interventions, there has been an acceptance of the social and structural factors as true representatives of the social, economic, organizational, and political inequities that determine HIV vulnerabilities (Baral et al., 2013). The structural drivers alone do not directly cause the acquisition and transmission of HIV but mediate lower-order risks at the individual or network levels to cause the acquisition and onward transmission of HIV. Understanding the various levels of HIV risk has provided a good understanding of a pathway for delivering HIV prevention measures through multi-level HIV prevention strategies (Baral et al., 2013).

Kaufman et al. (2014) noted the limited holistic approach toward changing HIV-related behaviors around an individual's knowledge, attitude, emotions, and risk perception. These authors also mentioned that these limitations extend to power dynamics that play out among partners, service accessibility, economic inequalities, criminalization of vulnerable groups, and policies that should make HIV a priority health issue. According to Baral et al. (2013), preventive and other measures to promote the well-being of PLHIV should be delivered in the form of packages of services capable of addressing HIV infection risks at various levels.

While focusing on biomedical, behavioral, and structural components when applying the combination of HIV prevention interventions, a theoretical framework should provide appropriate guidance to characterize drivers of HIV risk at each of these levels when collecting necessary data. Baral et al. (2013) identified the individual risk of HIV transmission as sharing injection devices and unprotected penile-vaginal or penile-anal sex. According to Baral et al., while there are proximal individual-level risks and mediators of HIV acquisition or transmission at the individual level, the higher-order social and structural-level risks act as facilitators or impediments to HIV transmission on population levels. Among key HIV populations, biological, social, and structural influences on disease processes should have theoretical explanations to guide the integration of evidence-based biomedical, behavioral, and structural interventions for successful HIV prevention strategies.

The complex associations between the social networks, individual practices, physical environment, health, and structural factors such as access to care could easily be explained using the SEM, which makes the model different from other models which articulate underlying individual motivations for behaviors (e.g. health belief model and the theory of planned behavior; Baral et al., 2013). According to Gombachika et al. (2012), SEM evolved from the works of researchers such as Bronfenbrenner, Mc Leroy, and Stokols. The SEM is a useful conceptual tool for examining patient engagement within the HIV care system (Berger et al., 2016) and can effectively analyze the social and cultural issues and decisions involving HIV (Gombachika et al., 2012).

SEM framework explains individual behaviors at the intrapersonal, interpersonal, community, and public policy dimensions to describe the interactions between these levels (Baral et al., 2013). At the individual level are knowledge, attitude, and behavior; interpersonal/networks have social networks, social support, and community has relationships among organizations/institutions. Public policy comprises local, state, and national laws (Baral et al., 2013). This study will use the SEM to explain the existence of a relationship between the variables in this study. The 5 stages of the SEM – individual, interpersonal, organizational, community, and public policy (Aronica et al., n.d.), address the complex and interactive roles these elements play in health and guide the development of solutions well as in the success or failure of attempts to address these problems (ATSDR, 2015).

The SEM employs biological and social population health analyses to explore factors underpinning social inequalities and health disparities. Knowledge of the intrapersonal aspect of SEM has guided the design of effective interventions to modify individual behavior (Baral et al., 2013). The 5 SEM levels reciprocally influence health behavior in no specific order or direction. The SEM is a valuable framework for investigating the interplay among multi-level and interactive factors that impact access to and acceptability of HIV/AIDS treatment and care services along the HIVCC (Yakob & Ncama, 2016). The versatility of the SEM has allowed its integration into other theoretical components and models, which according to RHIH (2022), are very useful in designing policy approaches and comprehensive health promotion or disease prevention programs.

In the field of public health, researchers have extensively used SEM to identify and address specific health behaviors that interact with and influence health, according to Coreil (2009). RHIH (2022) noted the usefulness of SEM in the design of health promotion and disease prevention programs to address cardiovascular disease risk factors and colorectal cancer prevention. The SEM is a valuable tool for creating sustainable solutions for at-risk individuals and societies (RHIH, 2022). According to RHIH (2022), SEM creates a better understanding of the factors that influence health and well-being and provides a complete perspective of the factors that affect specific health behaviors, including the social determinants of health. The SEM considers the complex interplay between individual, relationship, community, and societal factors that contribute to poor health and guides the development of disease prevention and health promotion approaches that include actions that should be instituted at various levels (NCIPC, 2022).

Though the acceptability of healthcare resides within the clients, according to Yakob and Ncama (2016), this is affected by the clients' perceived accessibility, the health system's responsiveness, clients' psychological status, experiences, and expectations. Structural factors such as wars, famines, or droughts may be farther from the individual than the availability of access to a clinic or income-generating opportunities in a particular community may be more removed from individual control than others (Kaufman et al., 2014). Although there might be different levels of these factors, they are highly interactive, with processes ranging between micro and macro. The structural influences function only with individuals' cooperation and interpersonal relationships and vice versa (Kaufman et al., 2014).

Therefore, multiple factors impact healthcare access and acceptability (Yakob & Ncama, 2016). The SEM offers a better understanding of the RHIVC, a critical element in the HIVCC (Berger et al., 2016), considering the individual and their affiliations to people, organizations, and their community. The SEM provides an integrated approach that focuses on changing the physical and social environments rather than modifying only individual health behaviors by allowing the understanding of the range of protective and risk factors affecting health (NCIPC, 2022). Researchers, health professionals, and community leaders can use this model to identify factors at different levels impacting health because it illustrates how interrelated these factors influence health (ATSDR, 2015). Besides helping to clarify these factors, the model also suggests that sustaining a practical prevention effort over time will require health promotion activities across multiple levels of the model simultaneously to achieve population-level impact (NCIPC, 2022).

Social and structural determinants of HIV vulnerabilities represent social, economic, organizational, and political inequities in society (Baral et al., 2013). According to Kaufman et al. (2014), SEM as an approach to care seeks to define how multiple factors at various levels create a positive or negative health-promotion environment by shaping and influencing individual behaviors (Kaufman et al., 2014). This framework addresses how factors within and outside the individual act as determinants of health and how its remediation could improve and promote health (Coreil, 2009).

Berger et al. (2016) described SEM as a useful conceptual tool for examining patient engagement within an HIV care system. This study will use this model to identify the obstacles and facilitators of RHIVC and ARTA in AKS. Ferrer et al. (2015) applied this framework to study the barriers and facilitators to the uptake of school-based HPV vaccination programs in an ethnically diverse group of young women. Yakob and Ncama (2016), in their study, used the SEM to investigate multi-level and interactive factors such as individual, community, institutional, and policy factors that impact access and acceptability of HIV care and treatment.

Other researchers, such as Kempf et al. (2010) and Magnus et al. (2013), have examined barriers and facilitators at multiple levels within the healthcare system which influence HIV care engagement using the SEM. Mugavero et al. (2011), in their study, applied the SEM to a review of the literature examining the interaction of factors that impede the diagnosis, linkage, and retention of HIV clients in care, including the role of supportive services. Their study also examined clinical care infrastructure and the impact of national and local policies on testing, linkage, and treatment (Berger et al., 2016). Mugavero et al in their study according to Berger et al. (2016), highlighted the model's success in promoting care engagement, including case management and patient navigation programs and the integration of health care systems.

Other studies have used the SEM to identify and address institutional-level barriers to care, such as long clinic appointment wait times and non-flexible clinic hours (Kempf et al., 2010). Yacob and Ncama applied the SEM framework to highlight the interdependent relationships between individuals' behaviors and the social context

affecting HIV/AIDS treatment and care service. SEM has been used to explain the enabling or prohibiting factors affecting HIV MA (Wilde, 2018), to study MA and CR (Umeokonkwo et al., 2019), and in a diverse socio-cultural context as a guide to epidemiologic studies among key populations at risk for HIV (Baral et al., 2013).

This research will test the hypothesis that there is no statistically significant association between gender and LC, MA, and CR after controlling for covariates. These covariates are SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV. SEM will demonstrate how the individual variable (gender) affects LC, MA, and CR (MacCarthy et al., 2016). The SEM has been applied to HIV research previously and extensively because this theory's functions allow researchers to explain the complex relationship between social networks and access to care factors, individual practices, the physical environment, and health (Baral et al. (2013).

They also helped explore HIV testing behavior and attitude (Dyson et al., 2018) and the barriers and facilitators to retaining and re-engaging HIV clients in care (Berger et al., 2016). The SEM has been previously used to identify and describe the interactions between individuals' behaviors using dimensions such as knowledge, attitude, behavior, social networks, social support, relationships among organizations/institutions, and local, state, and national laws (ATSDR, 2015).

Though there is a barren of research and a paucity of literature on the gender-based HIV epidemic, CR, and MA in AKS, Nigeria, the secondary variables examined used SEM as a theoretical foundation. Many publications included in this literature

review have addressed gender, SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV through the lenses of the SEM. The rationale for using this theory is that it could allow the literature to align more consistently with the primary research question of how gender affects LC, MA, and CR.

Levels of the SEM

The SEM adopted for this study has 5 levels which are: intrapersonal, interpersonal, institutional, community, and public policy factors. Public health researchers have extensively used these 5 levels of SEM to identify the interplay of factors that interact and influence health behavior.

The Individual-Level

The individual level is made up of factors at the micro-level, such as individual beliefs (Gombachika et al., 2012); Kaufman et al., 2014), perceptions, or emotions (Kaufman et al., 2014). At this level exist socioeconomic barriers and income, such as the client's financial problems, which negatively affect engagement in care (ATSDR, 2015; Berger et al., 2016). Psychosocial factors, particularly mental health, and substance use issues, also fall under the individual-level factors. The UNAIDS' revised goals could be hindered at this or any other level. The goal involves the diagnoses of 95% of all PLHIV, ensuring that 95% of all diagnosed PLHIV are on ART and that 95% of PLHIV who are on ART attain viral VS (VML, 2022). Not only is HIV testing and counseling the gateway to the clinical cascade, LC and treatment, including pre-ART care and treatment initiation, will ideally immediately follow an HIV-positive diagnosis (Babalola et al., 2017).

Often, however, clients choose to delay seeking care or initiating treatment after diagnosis, resulting in high mortality rates in resource-limited settings (Babalola et al., 2017). At the intrapersonal level, barriers could affect linkage to HIV care, CR, and MA in both genders. The drivers of HIV perpetuation in both genders include reduced access to ART (FHI, 2019; Sabri et al., 2017), low HIV risk perception, and high-risk sexual behavior (FHI, 2019). Others are intravenous drug use (Sabri et al., 2017), socio-cultural practices, and religious and superstitious beliefs about HIV/AIDS that adversely affect the health-seeking behavior of the population. These practices could fuel stigma and discrimination within the various communities and constitute a significant barrier to access to care (FHI, 2019).

Client facilitators are the strength employed by clients who prioritize care engagement, attributed to client self-esteem and a commitment to self-care (Berger et al., 2016). Transportation, individual biology, and other personal characteristics, such as age, education, and health history, are included here (ATSDR, 2015). Other characteristics that influence behavior at the individual level include knowledge, attitude, and skills (Gombachika et al., 2012). According to Mukumbang et al. (2017), studies conducted in low- and middle-income countries have shown that factors influencing RIC are similar to those influencing adherence to ART. The level involves relationships revolving around friends, partners, and family members who influence a person's behavior and contribute to his or her experiences (ATSDR, 2015).

The Interpersonal Level

The interpersonal level provides social identity and role definitions such as partner, friends, and family (Gombachika et al., 2012). This level defines the patient's HIVK and AHIV. It could help address how these variables interact with gender to promote or prevent LC, MA, and CR. The level includes dyadic or family influences, such as relationship satisfaction or social support (Kaufman et al., 2014). Berger et al., (2016) explained that patient-provider relationships (forging solid relationships with staff members in the clinic) are part of this level. The level involves relationships revolving around friends, partners, and family members seen as members of a social circle who influence a person's behavior and contribute to his or her experiences (ATSDR, 2015). The intrapersonal level provides social identity and role definitions such as partner, friends, and family (Gombachika et al., 2012).

The Community Level

The community has an influence at a more significant group level, such as social capital or community norms (Kaufman et al., 2014). Coordinated and collaborative care, such as collaboration with partner agencies, are strengths for retention efforts. The level explores the settings in which people have social relationships, such as schools, workplaces, and neighborhoods, to identify the characteristics of these settings that affect health (ATSDR, 2015). Also included are organizational rules, policies, and formal and informal structures (Gombachika et al., 2012).

The Institutional Level

At the institutional level, the focus is on factors within the health system. These factors include service delivery and quality of service providers, resource availability, confidentiality (Kaufman et al., 2014), and clinic policies and procedures (Berger et al., 2016). It includes broad societal factors that favor or impair health, such as norms (ATSDR, 2015; Gombachika et al., 2012), economic, educational, and social policies that create, maintain, or lessen socioeconomic inequalities between groups (ATSDR, 2015)., Policy Level

These include macro-level factors affecting behavior, such as the economy, political climate, enforcement of policies and laws, or funding environment (Kaufman et al., 2014). Also, this category includes cultural context and national policies on health (Gombachika et al., 2012). At the intrapersonal level, SEM has been widely used to design effective interventions to modify individual behaviors (Baral et al., 2013). Gombachika et al. (2012) explained how the model addresses the complexities and interdependences between socioeconomic, cultural, political, environmental, organizational, psychological, and biological determinants of behavior.

Even though individuals are responsible for instituting and maintaining lifestyle changes necessary to reduce risk and improve health (Gombachika et al., 2012), different factors at different levels moderate these lifestyles. The SEM describes the multiple levels of influence on individual behavior to create environments conducive to health promotion (Kaufman et al., 2014). It conceptualizes health broadly and focuses on multiple factors that might affect health (ATSDR, 2015; Murphy, 2018). Health

professionals, researchers, and community leaders can adopt the model to identify factors at the individual, interpersonal, community, and societal levels that contribute to poor health and develop approaches to prevention and health promotion that include action at those levels (ATSDR, 2015

Summary and Conclusion

In conclusion, some variables used in this study have more foundational literature than others, but all the examined variables could impact LC, MA, and CR. This research will test the hypothesis that there is no statistically significant association between gender and LC, MA, and CR after controlling for covariates. The covariates in this study are SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV. SEM will demonstrate how the individual variable (gender) affects LC, MA, and CR (MacCarthy et al., 2016). The SEM has been applied to HIV research extensively because this theory's functions allow researchers to explain the complex relationship between social networks and access to care factors, individual practices, the physical environment, and health (Baral et al., 2013).

Researchers in HIV studies have penned women's behaviors across the HIV treatment continuum to gender inequalities and a critical driver of their vulnerabilities to the infection (Almirol et al., 2018; Amin, 2015; Avert, 2020b; TGF, 2019). Globally, HIV infections among young women aged 15-24 years are 60% higher than among young men of the same age (Amin, 2015; Avert, 2020b; TGF, 2019). More than half the number of PLHIV worldwide are women and adolescent girls disproportionately affected

by HIV because of vulnerabilities created by unequal cultural, social, and economic status, according to Avert (2020b).

Other factors are denial of inheritance or succession rights, forced marriage, widow inheritance where women as seen as a part of their husband's property to be inherited by his family, and the use of sexual favors in exchange for employment or university grades (USDS, 2020). There is economic discrimination, the stigma associated with HIV in which the public considers HIV a disease that results from immoral behavior, and punishment for same-sex sexual activity. Thus, persons with HIV often lost their jobs or were denied healthcare services (USDS, 2020).

Adedokun et al. (2020) identified the social factors responsible for the feminization of the epidemic in Nigeria to include, poverty, child marriage, gender-based violence, gender norms, disabilities, harmful traditional practices, human rights, legal, and political factors. Economic discrimination and stigma are also associated with HIV because the public considers HIV an outcome of immoral behavior and punishment for same-sex sexual activity (USDS, 2020). In these societies, persons with HIV/AIDS often suffer from social and economic denial, such as losing their jobs and denial of healthcare services (USDS, 2020).

According to Amin (2015), women are simply directing their energies toward securing fundamental survival needs such as clean drinking water, food, and shelter for themselves and their families, thus neglecting their health needs and compromising their care within the HTC. While some of the variables in this study, such as the effects of

SES, age, and race on MA, are well-known and established for decades, others have not been sufficiently studied and require future research to draw causal inferences.

Despite well-described disparities experienced by women compared with men along the HIVCC, insufficient research and information delineate gender-specific drivers affecting men more than women or vice versa in AKS. Also, it is unclear which perceived risks of HIV care engagement are most salient for men and women across different settings in AKS, leaving a gap in the literature because such information may help guide the design of scalable interventions. A literature review of this topic showed a significant research vacuum in gender-based strategies to improve LC, MA, and CR in the AKS, SSG, and a gap in HIV care strategies in AKS. The focus of early HIV scholars in Akwa Ibom was on the socio-cultural influences and other factors influencing HIV spread, leaving a gap that requires a research that will examine the association between gender and LC, MA, and CR with SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV as moderators. Since the impact of gender on the drivers of HIV epidemic was an unexplored area of research in AKS (Adedokun et al., 2020), my research is needed to explore how gender drives HIV infection (which drivers are more associated with being a man or a woman) and impact care along the HTC. For these reasons, this literature was crucial in further examining how to help individuals achieve positive results along the HIV continuum. The following section will address the methodology used in the research vacuum on gender-based strategies to improve LC, MA, and CR in the SSG.

Chapter 3: Research Method

Introduction

This research explored how gender impacts the drivers of the HIV epidemic and answered questions on whether these drivers affected a man and a woman living in the same locality in the same way, controlling for extraneous variables. The study outcome may deepen knowledge of the dynamics of HIV transmission. In this cross-sectional study, the quantitative research approach was adopted to test the association among the variables of interest. The major sections of this chapter will include research design and rationale, methodology, population, sampling and sampling procedures, operationalization, data analysis plan, threats to validity, ethical procedures, and summary.

Research Design and Rationale

The independent variable in this study was gender (male and female), and the dependent variables were LC, MA, and CR. The secondary variables examined with LC, MA, and CR were SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV. The research design for this study was a quantitative, cross-sectional predictive study using secondary data from the 2017 AKAIS dataset.

This research design has a connection to the three research questions because a cross-sectional study design allows researchers to compare many different variables simultaneously (Institute for Work and Health, 2015). The research used the quantitative method to explore the association among the variables to determine the existence of an

association. The predictive analysis incorporates statistical techniques and theoretical models to analyze current facts to predict future events or disease occurrences, including human behavior patterns (Jumento, 2017). Theoretical models, in this case, assisted in capturing relationships or associations between independent (predictors) and dependent (outcome) variables.

In this study, the effect of the independent variables of gender on the dependent variables, with the moderation of the covariates, was tested using the bivariate logistic regression analysis and Chi-square test of the association. The study used bivariate logistic regression analysis (inferential statistical tool) to determine the association among the variables. The Chi-square test of the associations was used to assess the effect of independent variables on dependent variables, with the moderation of the covariates. A bivariate logistic regression analysis was used to make a determination about the existence of an association among the variables of interest compared (Adedokun et al., 2020; Oduwole, 2020) and makes a good fit using this type of analysis to answer these questions and test the hypothesis. According to the literature, the rationale for including the covariates of SDC, HIVK, and AHIV was due to their potential influence on LC, MA, and CR in both genders among PLHIV. The results from the survey were interpreted by conducting a bivariate logistic regression analysis for each variable and comparing the percentage of LC, MA, and CR based on whether the PLHIV is a man or a woman. Analyzing the data set from AKAIS helped answer all the research questions for each variable of interest.

The cross-sectional methodology and observational study were justifiable because they allowed for the exposure and outcome to be determined simultaneously for each subject (Carlson & Morrison, 2009). The methodology and design were appropriate for screening hypotheses because they required a relatively shorter time commitment and fewer resources. The data collection method allowed for the sampling of a representative population. Therefore, the conclusion provided a precise estimate of HIV prevalence in AKS.

This study's time and resource constraints were the wait time to access the AKAIS data from PLOS One.org and fhi360.org. Also, IRB approval was necessary (Walden's Office of Research and Doctoral Services, 2021) before authorization to access the secondary data from PLOS One.org and fhi360.org could be requested. The cross-sectional design provided a snapshot of the HIV prevalence in AKS, allowing the research questions posed in this study to be answered for 2017. This research design was consistent with strategies needed to advance knowledge in this discipline because it will give relevance and a reasonably recent in-depth analysis of the population of individuals with HIV in AKS in 2017.

According to Adedokun et al. (2020) and Negedu-Momoh et al. (2021), AKAIS, the first population-based survey in any state in Nigeria, used a robust methodology to address limitations associated with representativeness in previous surveys to provide estimates of HIV incidence. The AKAIS presented a paradigm shift in estimating HIV prevalence in Nigeria because of its focus on the general population rather than sentinel surveillance (Adedokun et al., 2020). Findings from the survey could provide good

empirical data on the prevalence of HIV in AKS and contribute to understanding other behaviors and SDC in the study population. The data could also guide the scale-up of HIV prevention and control strategies toward achieving epidemic control in AKS. As the first study examining the association between gender, LC, MA, and CR in PLHIV in AKS, data from this study may be available to advance the knowledge of the discipline.

The design of choice in this study was consistent with research designs that could advance knowledge in HIV care and public health. According to Wilde (2018) and Yusuf (2019), cross-sectional design has consistently yielded a better understanding of how to approach HIV MA and factors that may increase or decrease it. Wang and Cheng (2020) posited that a cross-sectional study facilitates data analysis from a population at a single point, is effective in measuring the prevalence of health outcomes, guides the understanding of determinants of health, and is an excellent tool for describing features of a population. At the same time, the quantitative research method can provide insight into the association among the variables in the study (Sana, 2019). A better public health practice and experience for PLHIV may be enhanced when using quantitative analysis to answer research questions (Yusuf, 2019).

Methodology

Target Population

The entire 5,482,177 people (projected 2016 population) who resided in the 8,412 square kilometers boundary of AKS or 329 political wards or Enumeration Areas (EAs) as projected from the 2006 population census was the target population for this study (Adedokun et al., 2020; Negedu-Momoh et al., 2021). From this population, respondents

were then sub-classified by LGAs into the 31 LGAs in the State (AKSG, 2022; Adedokun et al., 2020; Negedu-Momoh et al., 2021). Further, these LGAs were divided based on the existing 329 political wards or clusters or EAs into households (Adedokun et al., 2020; Negedu-Momoh et al., 2021). Three hundred ninety-four preliminary HIV-seropositive respondents ≥15 years and above from the target population who provided whole-blood specimens for CD4+ cell count determination and plasma storage (Negedu-Momoh et al., 2021) were the sample for this research.

Sampling and Sampling Procedures

The sample size estimation applies to all studies and should be undertaken before data collection since it looks at more than just the Type II error (Jones et al., 2003). Dahiru et al. (2006) stated that the study's design and objectives are essential and mandatory factors that should determine the sample size. Estimating the sample size apriori prevents wasteful consequences of "under-powering" or "overpowering" in which sample sizes are too large or too small, which may lead to remarkably high study costs and ethical implications of involving too many participants (Fox et al., 2009). Jones et al. (2003) posited that the sample size calculations indicate how the statistical tests used in the study are likely to perform, which is affected by the type of test used. The three elements that determine the sample size, according to Buyang (2021), are Type I error (alpha), power of the study (type II error), and effect size. Sample size estimation will require the effect size, alpha level, and power.

Studies that test hypotheses to generalize findings to a population need sufficient power to minimize the likelihood of Type I and Type II errors (Fox et al., 2009). Since

statistical significance and power are affected by sample size, the chances of gaining a statistically significant result increase with a large study sample; thus, increasing the sample size will enhance the study's statistical power (Fox et al., 2009). According to Fox et al. (2009), statistical power is a function of three variables: sample size, the chosen level of statistical significance (α), and effect size, and the calculation of power entails recourse to tables of values for these variables. Increasing the sample size will increase Statistical significance and power, thus, reducing the likelihood of Type I and Type II errors (Fox et al., 2009).

A small effect size will result in many studies with small sample sizes likely to be "underpowered," according to Fox et al. (2009). In contrast, a large effect size will allow a relatively small sample study to have sufficient power to identify the effect under investigation (Fox et al., 2009). Therefore, an accurate estimation of the effect size is essential for calculating power before a study begins, and hence the necessary sample size, according to Fox et al. The values assigned Type I and Type II errors when calculating sample size are usually fixed, according to Bujang (2021). The value for Type I error is usually fixed at 0.05 or 0.01, depending on the researcher (Bujang, 2021). The 0.05 or 0.01 means the researcher is confident 95% of the time that the study result reflects a true effect, whereas 5% of the time, it is a chance result from random associations in the sample (Fox et al., 2009) or at 99% of the time result reflects a true effect. In contrast, 1% of the time, it is a chance. Conventionally, a value of 0.80 or 80% is the target value for statistical power (Buyang, 2021; Dahiru et al., 2006; Fox et al., 2009; Kadam & Bhalerao, 2010; Suresh & Chandrashekara, 2012); though most studies

accept a power of 90% (Buyang, 2021) indicating a 20% or 10% Type II error respectively. The value means that it will be acceptable if, at 20% or 10%, the researcher misses a real difference (to reduce to 20% or 10% the possibility of a false negative result). Hence, the only factor that remains unspecified in calculating sample size is a study's effect size (Bujang, 2021).

Power analysis is the name given to determining the sample size for a research study (Jones et al., 2003; Kadam & Bhalerao, 2010; Suresh & Chandrashekara, 2012). It is the probability that a true effect will be detected when it exists (Kadam & Bhalerao, 2010; Suresh & Chandrashekara, 2012). Avoiding a Type II error requires a decision on an acceptable false-negative rate that will make the study adequately powered for accurate acceptance or rejection of the null hypothesis (Kadam & Bhalerao, 2010; Suresh & Chandrashekara, 2012). According to Kadam and Bhalerao (2010) and Suresh and Chandrashekara (2012), this false-negative rate is the proportion of positive instances that will be erroneously reported as negative and is referred to in statistics by the letter β. The probability of failing to detect a difference when it exists is the "power" of the study, which is equal to (1 –β).

Determining whether two groups are the same (accepting the null hypothesis) or are different (accepting the alternative hypothesis) can potentially lead to two kinds of errors (Jones et al., 2003). Power calculations help determine how many participants will be required to avoid a type I or II error. A type I error will occur when the null hypothesis is rejected incorrectly (that is, it is true, and there is no difference between the two groups) and reports a difference between the two groups. The alpha (α) value or the

statistical significance of a statistical test is the likelihood of committing a Type I error (finding a relationship that does not exist). The design of a statistical significance test is to account for sample size; thus, the larger the sample, the easier it is for results to reach the significance test (Fox et al., 2009). The quoted significance level of a test α is p, and the p-value marks the probability of committing a Type I error. A p-value of 0.05 indicates a 5% or one in 20 chance of committing a Type I error, and the α value represents the probability of this occurring (Fox et al., 2009). According to Fox et al. (2009), statistical significance measures the likelihood that positive results reflect an actual effect and conclusions about differences are from existing findings.

The probability that the test will reject the null hypothesis when the null hypothesis is false is the statistical power of a test, i.e., the likelihood of avoiding a Type II error (Fox et al., 2009). When the result of a study supports the null hypothesis (there is no association between variables under investigation), whereas there is an association in the real world that the study failed to find, the null hypothesis is false. This is a Type II error (accepting a false null hypothesis) (Fox et al., 2009; Jones et al., 2003). A statistical test's beta (β) value is the likelihood of committing a Type II error, and the value (1 - β) is the test's statistical power. A Type I error could be reduced by increasing the level of significance at which one is willing to accept a positive finding will reduce the test's statistical power, thus increasing Type II error (missing an association that exists). Conversely, avoiding a Type II error may likely lead to a Type I error (finding an association that does not exist) (Fox et al., 2009).

Researchers should avoid Type I and Type II errors, which could lead to incorrect inferences about the world beyond the study, and there is a trade-off in practice, according to Fox et al. (2009). Reducing the likelihood of committing a Type I error by increasing the level of significance at which one is willing to accept a positive finding reduces the statistical power of the test, thus increasing the possibility of a Type II error (missing an association that exists; Fox et al., 2009). Since both the statistical significance and statistical power are affected by sample size, an increase in sample size will enhance the study's statistical power as sample size increases (Fox et al., 2009). Researchers are cautioned not to unnecessarily increase the size of their samples at the great expense of time and resources (Fox et al., 2009).

The other factor affecting the power of a study is the effect size (ES), which measures how wrong the null hypothesis is (Fox et al., 2009). An effect size may be a difference between groups or the strength of the association between variables. If an ES is small, a study with a small sample size will likely be underpowered (Fox et al., 2009). However, if an ES is large, a small sample size study could have sufficient power to identify the effect under investigation. Effect size could be increased by making extreme comparisons or undertaking a longer or more robust intervention. However, this is usually the intractable element in the equation, and accurate estimation of the effect size is essential for calculating power before a study begins, hence the necessary sample size (Fox et al., 2009). According to Dahiru et al. (2006), when the respondents in a study are selected randomly from a sampling frame, and the study design is cross-sectional, the sample size can be calculated using this formula:

$$N = \frac{Z\alpha^2 \times P\,(1-P)}{d^2}$$

Using the formula, determining the sample size requires advanced knowledge of population parameters, e.g., mean, variation, and proportion (Dahiru et al., 2006). Various practicable and acceptable methods such as pilot surveys, previous survey results, and intelligent guess methods are the few ways to get population parameters (Dahiru et al. 2006).

With this formula, the sample size for this study will be determined by cluster sampling.

$$N = \frac{Z\alpha^2 \times P\,(1-P)}{d^2}$$

Where

$Z_\alpha = 1.28$ (the corresponding standard deviation value at 80% confidence limit).

P = 4.5% (the prevalence of HIV infection from the previous study)

D = 0.05 (the margin of error tolerance of the prevalence rate of the HIV infection).

$N = 1.28^2$ x 4.5/100(1-4.5/100)/0.05 x 0.05 = 28.16

The number of participants will be 28. From this analysis using Dahiru et al. (2006), the minimum number of participants needed for this study to yield significant results is 28.

During the AKAIS, a two-stage probability sampling technique was employed in selecting participants from a frame of eligible household residents of AKS from the target population of 5,482,177. According to Cadima et al. (2005), in the two-stage sampling design, the population is partitioned into groups, like cluster sampling, with new samples

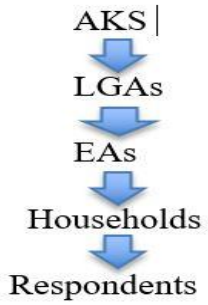
taken from each cluster. The first stage will sample the primary or first primary units or clusters. The second stage involves sampling the units or elements within those clusters, called sub-units, secondary, or second sampling units.

Galway et al. (2012) opined that the sampling strategy presented could generate a representative population sample. It could also reduce the potential for bias considering the study setting context-specific challenges and thus adaptable in conflict settings. According to Cadima et al. (2005), a two-stage sampling is employed to cut the cost associated with observing all units in a cluster, especially when the sizes of clusters are large clusters. Also, the strategy is used in surveys involving sampling housing units and rectifying practical quality control problems (The Pennsylvania State University, 2022).

The AKS population of 5,482,177 was classified into LGAs (31 LGAs). They were again further classified into 329 political wards or clusters or EA (EAs) as defined by the NPC during the 2006 Nigeria Census (Adedokun et al., 2020; Negedu-Momoh et al., 2021) and then into 4,313 households.

Figure 16

Sample Frame for Respondents Selection



All households in selected EAs were listed in the second stage, and 4,313 households within the 226 clusters were selected using systematic sampling, with all eligible household members included in the survey (see Figure 16). The sample size target for AKAIS was 9,145 respondents of adults ≥15 years, but 9,666 respondents aged ≥15 years were eligible, out of which 8,963 completed individual interviews, while 8,306 provided a good blood specimen (Adedokun et al., 2020; Negedu-Momoh et al., 2021) which were tested for HIV.

Three hundred ninety-four preliminary HIV-seropositive respondents provided whole-blood specimens for CD4+ cell count determination and plasma storage, while three hundred and seventy HIV-positive specimens were tested for the recent HIV infection using the LAg assay (Negedu-Momoh et al., 2021).

The sample was drawn from individuals in the households selected within the EAs. The inclusion criteria include being a resident of AKS aged ≥15 years and identifying as HIV positive during the study. Must consent to the study. Respondents 17 years with parental/guardian consent and assent and those above 18 with consent who assented to a questionnaire, venous blood draw, and HIV rapid testing. The Nigeria HIV testing guidelines were followed during the administration of the questionnaires. In the guideline, children under 18 years who are married, pregnant, and parents can independently consent to HIV testing and counseling. Participants aged 18 or older and mature minors aged 15 to 17 who consented responded to the questionnaire and had a venous blood draw and HIV rapid testing. According to Cohen (1992), as cited by

Jumento (2017), the sample size and power analysis are essential in a study design because they impact the researcher's ability to reject the null hypothesis correctly.

Archival Data

An email will be the primary communication tool adopted to contact PloS ONE and fhi360 for permission to access the scrambled dataset from the 2017 AKAIS currently in the custody of PloS ONE. The intended area of research and the variables of interest will be explained to these organizations. I will collaborate with the PLoS ONE team to receive a de-identified data set that could answer my research questions. Since the data shared and requested from PLoS ONE and fhi360 will be de-identified, the only permission needed to access the scrambled data will be a letter from Walden University. The data from FHI360 was shared after the intended research questions were explained to PLoS ONE and fhi360 teams.

Operationalization

The CDC questionnaire developed to guide HIV Impact Assessment (HIA) survey was adapted for the AKAIS, according to Adetoro et al. (2021).

Attitude to HIV: AHIV in this study will be graded by the responses given by the respondents to questions used to assess this variable in the AKAIS, and it will show how an individual or others feel and relate to PLHIV by expression of words or actions. Respondents in the AKAIS were asked seven questions requiring Yes = 1, No = 0, Don't Know = 98, or Refused to Say=99 to determine and measure attitude about HIV. The overall score will be derived from the sum of the scores for each respondent. Respondents scoring less than four out of seven for attitude will be classified as having a

negative attitude, while those scoring equal or above four will be classified as having a positive attitude. A question associated with attitude would be, “Would you buy fresh vegetables from a shopkeeper or vendor if you knew that this person had HIV?” (Adedokun et al., 2020, p. S1 Appendix).

Care Retention: The Institute of Medicine has defined retention in HIV medical care as at least two medical visits every 12 months, with a minimum of 90 days between visits (Roscoe & Hachey, 2020). RIC in this study will be a dichotomous variable. Patients would be considered retained in care if they had at least two outpatient/ambulatory medical service visits at least 90 days apart in a year. RIC was coded as 1 for retained and 0 for not retained in care. The client was coded as retained if the client received two or more visits at least 90 days apart. Participants who reported visiting the hospital two or more times at least 90 days apart and received antiretroviral refills at least once each quarter for all four quarters were classified as retained; otherwise, they were classified as not retained in care. The question was, “How many months or years has it been since you last saw a health care provider for HIV medical care?” (Adedokun et al., 2020, p. S1 Appendix).

Gender: The state of being a man or woman (typically used with reference to social and cultural differences rather than biological ones) (Wilde, 2019). This variable will be measured by self-reported information from the study's participants. The level of data for this variable will be nominal and scored as Male = 0 or Female = 1.

HIV Knowledge: HIVK will be operationalized by the responses given by the respondents to these six questions requiring Yes = 1, No = 0, Don't Know = 98, or

Refused to Say = 99. Can people reduce their risk of getting HIV by using a condom every time they have sex? Can people reduce their risk of getting HIV by using a condom every time they have sex? Can the risk of HIV transmission be reduced by having sex with only one uninfected partner who has no other partners? Can people get HIV from mosquito bites? Can people get HIV by sharing food with a person who has HIV? Can people get HIV because of witchcraft or other supernatural means? Can a healthy-looking person have HIV? (Adedokun et al., 2020, p. S1 Appendix). The scores will be summed up to obtain an overall score for each respondent. Respondents scoring three and below out of six for knowledge will be classified as lacking knowledge, while those scoring equal or above four were classified as having knowledge of HIV.

HIV Testing: HIV testing is a client-initiated test or diagnostic HIV testing, or routine HIV testing (UNAIDS, 2004) performed on an individual using blood or saliva (MedlinePlus, 2021) to determine if a person is infected with HIV (HIVinfo@NIH.gov, 2021). HIV testing should not be mandatory or compulsory; one must always respect personal choice and adhere to ethical and human rights principles through consent, confidentiality, counseling, Correct results, and connections to HIV care (UNAIDS, 2017). HIV testing will be assessed using patient self-report and coded as Yes = 1 or No = 0. HIV testing is being tested for HIV and receiving results at least once by the subject in any of their previous or current encounter with a health care provider or self-testing before the conduct of the 2017 AKAIS. The question to elicit this action will be, “Have you ever been tested for HIV?” (Adedokun et al., 2020, p. S1 Appendix).

Linkage to HIV Care: LC will be a dichotomous variable. Patients will be considered Linked to Care if the first clinic attendance date is performed within three months of HIV diagnosis in which the patient enters into specialist HIV care (Croxford et al., 2018; Koduah et al., 2019). LC is coded as Linked = 1 or Not Linked = 0.
The question will be, "After learning your HIV diagnosis, what month and year did you first see a health care provider for HIV medical care?" (Adedokun et al., 2020, p. S1 Appendix).

Medication Adherence: MA is taking medications (or other treatment) exactly as instructed by a health care provider (HIV.gov., n.d). MA will be assessed using the patient's self-reporting missed doses in the last month. Participants who took ≥95% of the regular doses of their ART in the preceding 30 days will be classified as having good adherence, while those below 95% of their ART were classified as having poor adherence. MA will be coded as 1 for good adherence and 0 for poor adherence. The question that will elicit this response is, People sometimes forget to take their ARVs, in the past 30 days, how many days have you missed taking any of your ARV pills (HIV medications)? (Adedokun et al., 2020, p. S1 Appendix).

Socio-Demographic Characteristics: SDC includes age, marital status, level of education, education status, religious affiliation, employment (Saeed et al., 2021), ethnic group/tribe, and residence (location). Age will be categorized into 15-24; 25-34; 35-44; 45-54≥ 55. For marital status: Never Married, Married, living with a partner as if married, widowed, divorced, separated, refused to say. Level of education will be: None = 1, Some Primary = 2, Primary = 3, Some Secondary = 4, Secondary = 5, Post-

Secondary/Tertiary = 6, Qur'anic Only=7, Don't Know=98, Refused to Say=99. Religious affiliation - Islam= 1, Christian=2, Traditional= 3, No Religion=4, Other (Specify)=96, Employment: Director/Upper Management=1, Other Management=2, Sales Manager/Representative/ Insurance Broker=3. Professional/Specialist=4, Self Employed/Own Small Business=5, Self Employed (Informal Sector /Hawkers/Vendors Etc.) =6, Blue Collar Skilled & Semi Skilled=7, Unskilled=8 Clerk/Clerical=9, Civil Servant=10, Farmer/Forestry/Fishing/Mining=11, Housewife=12 Pensioner/Retired=13, Unemployed=14, Student=15, Other (Specify)=96, Don't Know=98, or Refused to Say=9. Location as urban= 1or rural = 2. Ethnic Group or Race: Self-identified from participants as Annang=1, Ibibio=2, Oron=3, Efik=4, Yoruba=5, Igbo = 6, Hausa = 7, Obolo = 8, Ekid = 9.

Data Analysis Plan

This study used the bivariate logistic regression analysis and the Chi-square test on IBM SPSS Statistics 28 software from the Walden University database to analyze the variables. PLoS ONE and fhi360 provided access to the de-identified data in an aggregated form based on the variables of interest for this study. PLoS ONE confirmed that there were no outliers or other anomalies in the data with the removal of each participant's identifying names and numbers and data condensed based on the variables of interest. The secondary data for this study also pass through rigorous data cleaning to remove insignificant data. According to Watthananon & Mingkhwan (2012), data cleaning is necessary to ensure the reliability and integrity of secondary data employed in the research before analysis.

This study also used descriptive statistics to summarize the sample without drawing any inferences or conclusions about the sample population. According to Curtin University Library (2022) and Kaliyadan & Kulkarni (2019), frequency distribution tables, percentages, and other measures of central tendency are used in descriptive statistics to give a general summary of the study. Descriptive statistics in this study showed the frequency and percentage distribution of the dependent variable LC, MA, and CR in the population aged between ≥15 years in AKS and the independent variable of gender. Also, the descriptive statistics showed the frequencies and percentage distributions of covariates. The covariates were - SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV. As stated by Nzelu (2022), the benefits of descriptive statistics include ease of readability and understanding of data through summarization, and distribution of data across a possible range of values, whether the shape of the variables' distribution is normal or not. The data analysis plan was done based on the research questions.

In this study, the effect of the independent variables of gender on the dependent variables, with the moderation of the covariates, was tested using the bivariate logistic regression analysis and Chi-square test of the association. odds ratio (OR) was used in this study to indicate the change in odds for the dependent variable due to a one-unit change in the predictor variables denoted by Exp (β). According to Tamhane et al. (2016), OR measures an association in research studies quantifying the relationship between an independent variable and the outcome of interest. Exp(β) or odds Ratio in this study determined the predicted probabilities of an event happening (IBM, 2020) or the

predicted change in odds for a unit increase in the predictor (Center for Family and Demographic Research, 2006).

According to IBM (2020, para. 2), the odds ratio can be interpreted as the multiplicative adjustment to the odds of the outcome, given a *unit* change in the independent variable. For an odds ratio less than 1, increasing values of the variable will correspond to decreasing odds of the event occurrence, and for greater than 1, increasing values of the variable will correspond to increasing odds of occurrence (Center for Family and Demographic Research, 2006). As explained by Nzelu (2022), when Exp (β) is between 0.0 to less than 1.0, there is an inverse relationship or association between the predictor and the dependent variables, Exp (β) of >1.0 portrays a positive relationship or association between the independent and dependent variables, while Exp (β) with a value of 1.0 indicates no difference. The OR with a 95% confidence interval of p-0.05 was used in Chapter 5 to report the study result.

The confounding effect of these covariates on the association between the main predictor variables and the dependent variable was tested to ascertain if they influence how the predictors impact the dependent variable. Many other studies have reported these covariates to impact HIV testing (Adedokun et al., 2020; FHI). The rationale for the covariate inclusion of age, income, and employment was to determine the impact of these demographic variables on the association between the independent and dependent variables. The results of the study were interpreted using probability values (p-values) to determine the statistical significance of the hypotheses testing depending on if the p-value is 5% or lower and if the observed differences between the association are not merely due

to chance. Also, odds ratios with 95% confidence intervals were used to interpret the results.

Bivariate logistic regression analyses and the Chi-square test of the association was used to test the hypotheses at a 0.05 level of significance to assess how the independent variables (IVs) affect LC, MA, and CR. Using the formula from Dahiru et al. (2006). The alpha (α) of 0.05, power of 0.80, and prevalence from the original study was 4.5% from the previous study; the minimum sample size needed for the analysis was estimated at 28 households per cluster. In order to address the external validity or generalization of findings, the study sample was selected randomly.

The research questions and hypothesis for this research study are as follows:

RQ1: Is there an association between gender and LC after controlling for SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV?

$H_0$1: There is no statistically significant association between gender and LC after controlling for SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV.

$H_1$1: There is a statistically significant association between gender and LC after controlling for SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV.

RQ2: Is there an association between gender and HIV and retention after controlling for SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV?

$H_0$2: There is no statistically significant association between gender and HIV CR after controlling for SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV.

$H_1$2: There is a statistically significant association between gender and HIV CR after controlling SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV.

RQ3: Is there an association between gender and HIV MA after controlling for socio-demographic characteristics (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV?

$H_0$3: There is no statistically significant association between gender and HIV MA after controlling for SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV.

$H_1$3: There is a statistically significant association between gender and HIV MA after controlling for SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV.

The bivariate logistic regression analysis, an inferential statistic, will be used to determine the association among the variables in this study, with the Chi-square test of the association to determine the effect of independent variables of gender on dependent variables, with the moderation of the covariates. The analysis plan for this research is to use the dataset provided by PLoS ONE, which came from AKAIS, and enter it into SPSS, then use SPSS as an analysis tool to conduct a regression analysis to answer the above research questions each variable of interest. A bivariate logistic regression analysis will

determine the existence of an association between two variables of interest which makes a good fit using this type of analysis to answer these questions and test the hypothesis (Adedokun et al., 2020).

The rationale for covariates inclusion is that these are some of the identified factors in the literature that could influence LC, MA, and CR in both genders among PLHIV. The results from the survey will be interpreted by conducting a regression analysis for each variable and comparing the percentage of LC, MA, and CR based on whether the PLHIV is a man or a woman.

Threats to Validity

The threats to the study's validity could be either internal or external. According to Slack and Draugalis (2001), Internal validity has to do with the rigor of the study design. Campbell and Stanley (1963) posited that a study lacks meaning without internal validity. Thus, anything that could affect the result's precision is a threat to internal validity. Slack and Draugalis (2001) opined that controlling for potential confounding variables gives the researcher confidence that the study result is the outcome of the interactions of the independent variables with the dependent variables, which prevents the likelihood of offering an alternative explanation for treatment effects.

External validity is the ability to generalize study results to a universal population. An indication that a study lacks external validity is if the sample is not representative. External validity, therefore, promotes the generalization and the estimated truth of conclusions drawn from the study, which would hold for other persons in other places and at other times (Trochim, 2006). In order to establish internal validity, the researcher

looks at the valid conclusion drawn from the research, whereas external validity only suffices if a study has internal validity (Campbell & Stanley,1963; Cook & Campbell, 1979).

The most common cause of a loss of external validity in observational research is that studies often employ small samples from a single geographic location or facility (Carlson & Morrison, 2009). According to Terrell (2016), a threat to external validity may arise from the actions of study participants, the sample process or method, or issues beyond the researcher's control. The randomized sampling technique and keeping the participant's dropout rate as low as possible improves the External validity (Trochim, 2006).

Confounding influences on the variables and individuals that were unknown to researchers may influence MA and cannot be controlled for within the sample, according to Wilde (2018). The study sample was randomly selected from the entire AKS population to address the external validity or improve the generalization of findings. The participants in this survey were randomly selected. The assumption is that the study sample was representative of the population of the 31 LGAs in AKS because of this selection methodology.

Ethical Procedures

The 2017 Akwa Ibom AIDS indicator survey data currently with PLoS ONE organization will be the secondary dataset for this study. Walden's IRB approval, a mandatory requirement, will ensure ethical data collection on human research participants. The AKAIS, according to Adedokun et al. (2020), had multiple protocol

approvals. The US approval was from FHI 360 Protection of Human Subjects Research Ethics Committee, North Carolina, U.S.A., with Approval #797214. In Nigeria, the AKS Ethics Committee Ministry of Health Uyo (Approval #MH/PRS/99/VOL.VII/506), Review Committee University of Uyo Teaching Hospital (Approval # UUTH/AD/S/96/VOL.XIV/482), and the Health Research Ethics Review Committee, the University of Nigeria Nsukka Teaching Hospital (Approval #UNTH/CSA/329/OL5) granted study protocol for the survey (Adedokun et al., 2020).

Participation in the study was voluntary, with signed informed consent. Children 15 to 17 years provided consent from parental/guardians in addition to assent, while participants aged 18 years and above-provided consent before participation (Adedokun et al., 2020). Regarding the data treatment, the shared dataset will be anonymous, and the de-identified data will be kept confidential on an encrypted computer. A secure personal server accessed only by the researcher will hold this data for 5 years per Walden IRB requirements. The AKAIS study was a project funded by PEPFAR through USAID under the Cooperative Agreement AID-620-A-00002, managed by an FHI 360-led consortium (Adedokun et al., 2020).

Summary of Design and Methodology

In summary, LC, MA, and CR among PLHIV can be challenging for many reasons, such as life events, not wanting to disclose an HIV status publicly, side effects of the medications, and substance abuse. This study will examine whether the drivers of the HIV epidemic in AKS evenly impact LC, MA, and CR in both genders and answer questions on whether the same driver will affect a similar effect on a man and a woman

living in the same locality, controlling for extraneous variables. The study outcome may deepen the knowledge of the dynamics of HIV transmission and why females may have higher odds of HIV infection than males, as stated by Adedokun et al. (2020).

The findings from this gender-based HIV study could generate some positive social changes. The positive social change goal or outcome from my study may include the availability of evidence-based knowledge to HIV care providers and policymakers in AKS. Such knowledge could guide the delivery of individualized HIV preventive measures along the HIV Treatment Cascade (HTC) to reduce the burden of HIV and improve the lives of individuals, families, and communities. The result may be a resource and learning materials that could assist those in the HIV field in identifying the needs of PLHIV based on gender. This information derived from the data analysis may be crucial in helping individuals achieve long-lasting VS to reduce the burden of HIV and improve the lives of individuals, families, and communities. The empirical data derived from this study on the prevalence of HIV in AKS may provide a good understanding of other behaviors and SDC in the study population that perpetuates HIV spread. The data could also guide the scale-up of HIV prevention and control strategies toward achieving epidemic control in AKS. Findings may broaden understanding and a receptive attitude towards PLHIV while also serving as a source of enlightenment among PLHIV on self-care, which may result in longer lives for those with HIV/AIDS.

Chapter 3 of this study covered the research approach and design, study sample, power analysis, instrumentation, data collection, data analysis, study variables, measurements of variables, protection of human participants' rights, and dissemination of

findings. The next chapter will present the study results, while Chapter 5 will discuss the results.

Chapter 4: Introduction

The focus of previous HIV studies in AKS, including the AKAIS, was on the socio-cultural influences and other factors affecting HIV spread (Adedokun et al., 2020). Past research interests left the impact of gender on the drivers of HIV infection in AKS an unexplored area. This development creates a gap in the literature and makes research on the association between gender and LC, MA, and CR with the moderation of SDC an impactful research project. My study on gender-based HIV epidemic, MA, and CR in SSN is purposed to fill this gap in the literature because previous studies covering AKS did not examine the impact of gender on the drivers of HIV during LC, MA, and CR. The primary research question is whether an association exists between gender and LC, MA, and CR after controlling for SDC, HIVK, and AHIV.

This research tested the hypothesis that there is no statistically significant association between gender and LC, MA, and CR after controlling for covariates. The study also explored drivers of HIV infection and their comparative exponential impact on men and women in AKS SSN because of the high rate of new HIV cases in persons 15 years and older and the epidemic's devastating effect. The study may fill the existing void in gender-based strategies needed to improve HIV care and explore whether the drivers of the HIV epidemic evenly impact both genders. As stated by TGF (2019), an epidemic-free goal is achievable when a more focused approach addresses the vulnerabilities that lead to HIV infection, including targeting high-risk HIV populations and those most affected by HIV.

The major sections of this chapter are the data collection, results, and summary. Data collection in the first section will provide the sampled population's baseline descriptive and demographic characteristics. Furthermore, I will document justification for including covariates in the regression model where applicable based on the multivariate regression analysis results. Under the result section, there will be a description of the descriptive statistics that defined the study sample and an evaluation of statistical assumptions for the study, including the statistical analysis of the findings. The exact statistics and associated probability values, confidence intervals around the statistics, and effect sizes will also be shown. The results will be illustrated using relevant tables and figures. The summary section will contain an overview of the chapter's key points and a transition to Chapter 5.

Data Collection

The secondary data set for this study came from the 2017 AKAIS, a household population-based HIV state-level representative survey conducted to inform HIV program response in AKS. The study (AKAIS) was conducted to provide program managers and policymakers along the decision-making chain with valuable evidence-based resources on the burden of HIV in the state. Data generated from the study also guided scale-up treatment and prevention services, including resources needed to evaluate current and future HIV preventive programs. A Walden IRB approval with an approval number 08-25-22-0737624 was necessary before authorization to access the secondary data from PLOS One.org and fhi360.org could be requested. The treatment of human participants in the AKAIS data collection gained US approval from the FHI 360

Protection of Human Subjects Research Ethics Committee, North Carolina, U.S.A. In Nigeria, the AKS Ethics Committee Ministry of Health Uyo, the Review Committee University of Uyo Teaching Hospital, and the Health Research Ethics Review Committee, University of Nigeria – Nsukka Teaching Hospital granted the study protocol for the survey (Adedokun et al., 2020). Regarding the treatment of the data, the shared dataset will be anonymous. The de-identified data will be kept confidential in an encrypted computer for 5 years and only accessed by the researcher per Walden IRB requirements.

AKAIS was a cross-sectional survey conducted from April 2017 to June 2017 (Adetoro et al., 2021) using a two-stage probability sampling technique to select participants from a frame of eligible household residents in AKS from a population of 5,482,177. The data collection tool for the section of AKAIS adopted for this study was the individual adult questionnaire for women and men aged ≥15 years adapted from CDC-HQ HIV Impact Assessment (HIA) questionnaire (see Appendix 1).

AKAIS researchers deployed a two-part survey with a behavioral component and a laboratory part. The behavioral component was an individual adult questionnaire that collected information from eligible persons aged ≥15 years on basic demographic characteristics, reproductive history, marriage, sexual activity, fertility, and family planning. In addition, the tool included questions regarding HIV and STI knowledge, attitude, behaviors, HIV testing, HIV care, and treatment uptake. The laboratory part involved the collection of venous blood samples.

The AKS' entire population of 5,482,177 was first classified into 31 LGAs, and the 31 LGAs were again further classified into 329 EAs. AKAIS researchers calculated an estimated 226 clusters, 4,313 households within these 226 EAs, and a sample size target of 9,145 adults ≥15 years within these households as a representative sample of adults ≥15 years.

Since the primary sampling unit was EAs, the first stage involved the selection of 226 EAs from the 329 EAs with a probability proportional to the size and stratified by geographic location. In the second stage, a fixed number of households (4,313) within the selected EAs (226 clusters) were selected using systematic sampling. A complete listing of all households in selected EAs was undertaken, and all eligible household members were included in the survey. Though the sample size target for adults ≥15 years participating in the AKAIS was 9,145 respondents, 9,666 respondents were eligible.

The behavioral component of the AKAIS questionnaire collected data from 8,963 participants through individual interviews, while 8,306 participants consented to HIV rapid testing in the laboratory part through the collection of venous blood samples (Adedokun et al., 2020; Negedu-Momoh et al., 2021). Three hundred ninety-four preliminary HIV-seropositive respondents provided whole-blood specimens for CD4+ cell count determination and plasma storage, while 370 HIV-positive specimens were tested for recent HIV infection using the LAg assay (Negedu-Momoh et al., 2021). A total of 4,313 household questionnaires were analyzed, representing the number of households in the survey.

The initial plan was to use the data from AKAIS cross-sectional study to examine the association between gender LC, CR, and MA with the covariates (SDC [location, age, education, marital status, employment, occupation, ethnic group], HIVK, AHIV, HIV testing, HIV status, HIV care, and HIV treatment) as moderators. Due to limitations encountered during data analysis and the missing responses by respondents, there was a need to revise the covariates. The covariates were revised thus to reflect this discovery (SDC [location, age, education, marital status, employment, occupation, ethnic group], HIVK, and AHIV).

The dataset was explored for an association between gender and LC after controlling for SDC, HIVK, and AHIV as moderators. These data should represent the entire population of AKS, which was 5,482,177 in 2016, out of which 1,456,920 were 0-15 years. AKAIS estimated population was 364,911 respondents ≥15 years. About 188,562 people lived with HIV in AKS, including the population 0-14 years out of the estimated 1,832,266 PLHIV in Nigeria (Akpan et al., 2022). Adedokun et al. (2020) stated that about 86,738 (46%) children 0-14 years are living with HIV in AKS. Thus, the estimated number of PLHIV ≥15 years in AKS based on Adedokun et al. (2020) and Akpan et al. (2022) was 101,824. The number of respondents who completed the questionnaire was 8,963 from a sample size of 9,145. Secondary data in this study had a predetermined sample size of 8,963 respondents aged ≥15 years.

The current research work was limited only to respondents aged ≥15 years who identified themselves as HIV positive during the study, with a final sample size of 62 respondents. In calculating the sample size using an alpha of 0.05, the minimum sample

size was 28 using the formula from Dahiru et al. (2006). I intend to use the results of this data to further the field and future research that will examine MA techniques amongst the HIV/AIDS population to improve the health and longevity of PLHIV/AIDS.

Discrepancies

There were significant and major discrepancies in the use of the AKAIS secondary dataset different from the plan presented in Chapter 3 of the proposal. While cleaning the AKAIS secondary dataset and arranging the variable frequencies of the 8,963 participants who were interviewed, only 62 respondents indicated that they were HIV positive during the survey (see Table 5). In the variables, all categories with too few categories (less than 5 data points) were merged or combined with the nearest category for analysis.

Table 5

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Age category (years) * Retention coded	62	100.0%	0	0.0%	62	100.0%
Age category * Adherence	39	62.9%	23	37.1%	62	100.0%
Age category * Linkage	62	100.0%	0	0.0%	62	100.0%
Location * Retention coded	62	100.0%	0	0.0%	62	100.0%
Location * Adherence	39	62.9%	23	37.1%	62	100.0%
Location * Linkage	62	100.0%	0	0.0%	62	100.0%
Record sex of the respondent * Retention coded	62	100.0%	0	0.0%	62	100.0%
Record sex of the respondent * Adherence	39	62.9%	23	37.1%	62	100.0%
Record sex of the respondent * Linkage	62	100.0%	0	0.0%	62	100.0%
What is your ethnic group/tribe? * Retention coded	62	100.0%	0	0.0%	62	100.0%

What is your ethnic group/tribe? * Adherence	39	62.9%	23	37.1%	62	100.0%
What is your ethnic group/tribe? * Linkage	62	100.0%	0	0.0%	62	100.0%
q105_edu * Retention coded	61	98.4%	1	1.6%	62	100.0%
q105_edu * Adherence	38	61.3%	24	38.7%	62	100.0%
q105_edu * Linkage	61	98.4%	1	1.6%	62	100.0%
Marital status * Retention coded	61	98.4%	1	1.6%	62	100.0%
Marital status * Adherence	38	61.3%	24	38.7%	62	100.0%
Marital status * Linkage	61	98.4%	1	1.6%	62	100.0%
Formal Educat * Retention coded	61	98.4%	1	1.6%	62	100.0%
Formal Educat * Adherence	38	61.3%	24	38.7%	62	100.0%
Formal Educat * Linkage	61	98.4%	1	1.6%	62	100.0%
have you done any work in the last 12 months for which you received cash or in kind * Retention coded	61	98.4%	1	1.6%	62	100.0%
have you done any work in the last 12 months for which you received cash or in kind * Adherence	38	61.3%	24	38.7%	62	100.0%
have you done any work in the last 12 months for which you received cash or in kind * Linkage	61	98.4%	1	1.6%	62	100.0%
What do you do for a living * Retention coded	33	53.2%	29	46.8%	62	100.0%
What do you do for a living * Adherence	20	32.3%	42	67.7%	62	100.0%
What do you do for a living * Linkage	33	53.2%	29	46.8%	62	100.0%
Knowledge * Retention coded	62	100.0%	0	0.0%	62	100.0%
Knowledge * Adherence	39	62.9%	23	37.1%	62	100.0%
Knowledge * Linkage	62	100.0%	0	0.0%	62	100.0%
Attitude * Retention coded	62	100.0%	0	0.0%	62	100.0%
Attitude * Adherence	39	62.9%	23	37.1%	62	100.0%
Attitude * Linkage	62	100.0%	0	0.0%	62	100.0%

A recategorization of the SDC (location, age, education, marital status, employment, occupation, religion, and ethnic group) was done to account for the low number of respondents (N = 62). Age was categorized into <30, 20-29, 30-39, 40-49, and>49, while the categories in the primary data were: <19, 20-29, 30-39, 40-49, 50-59, and >60. For marital status, the primary study had the following categories: never married, married, living with a partner as if married, widowed, divorced, separated, refused to say. My variables include never married = 0 (incorporating all respondents under refused to say and never married), married/cohabiting = 1 (which incorporates Married, living with a partner as if married), and previously married =2 (incorporating widowed, divorced, separated). In the primary study, levels of education were: None = 1, some primary = 2, primary = 3, some secondary = 4, secondary = 5, post-secondary/tertiary = 6, Qur'anic only = 7, don't know = 98, refused to say = 99. For this study, the levels are none = 0, primary = 1 (incorporating all respondents for some primary and primary), secondary = 2 (for some secondary and secondary), and tertiary = 3 (for post-secondary/tertiary). Qur'anic, don't know, refused to say were excluded since these were not responses provided by the respondents in my study. Religion in the Primary Study had the following categories: Islam = 1, Christian = 2, Traditional = 3, No religion = 4, other (specify) = 96. Religion was removed from my study since all respondents were Christians, and this category had no variance. Occupation: In the primary study, this category had: director/upper management = 1, other management = 2, sales manager/representative/ insurance broker = 3, professional/specialist = 4, self-employed/own small business = 5, self-employed (informal sector /hawkers/vendors etc.)

= 6, blue collar skilled and semi-skilled = 7, unskilled = 8 clerk/clerical = 9, civil servant = 10, farmer/forestry/fishing/mining = 11, housewife = 12 pensioner/retired = 13, unemployed = 14, student = 15, other (specify) = 96, don't know = 98, or refused to say = 99. In my study, a descriptive statistic was performed using all the primary variables. From the result, the group with the largest frequency was designated 1, and the others combined as 0. Self-employed was the group with the highest number of respondents. Thus, Other occupation = 0, self-employed = 1. For locality, the study has urban = 1 and rural = 0. For the ethnic group or race in the primary study, self-identified participants were Annang = 1, Ibibio = 2, Oron = 3, Efik = 4, Yoruba = 5, Igbo = 6, Hausa = 7, Obolo = 8, Ekid = 9. My study categorized it into Annang = 1, Ibibio = 2 (comprising respondents who identified as Ibibio/Efik/Ekid/Obolo), Oron = 3, and Others = 4 (for respondents who identified as Yoruba, Igbo, Hausa). The covariates initially proposed for the study were: SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, AHIV, HIV testing, HIV status, HIV care, and HIV treatment were revised and HIV testing, HIV status, HIV care, and HIV treatment were dropped after data analysis. The research questions and hypothesis were also revised.

RQ1: Is there an association between gender and LC after controlling for SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV?

$H_0$1: There is no statistically significant association between gender and LC after controlling for SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV.

$H_1$1: There is a statistically significant association between gender and LC after controlling for SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV.

RQ2: Is there an association between gender and HIV and retention after controlling for SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV?

$H_0$2: There is no statistically significant association between gender and HIV CR after controlling for SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV.

$H_1$2: There is a statistically significant association between gender and HIV CR after controlling SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV.

RQ3: Is there an association between gender and HIV MA after controlling for socio-demographic characteristics (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV?

$H_0$3: There is no statistically significant association between gender and HIV MA after controlling for SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV.

$H_1$3: There is a statistically significant association between gender and HIV MA after controlling for SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV.

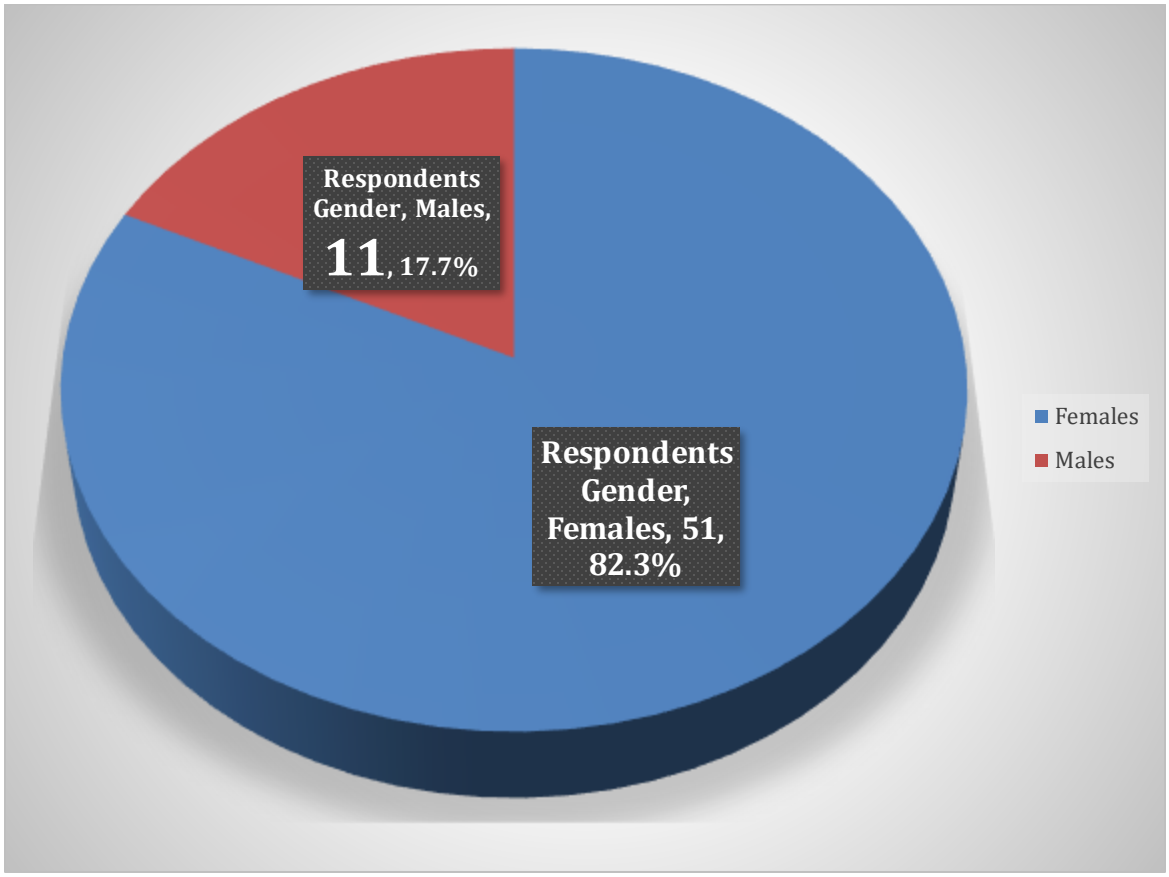
Study Results

I used secondary data from the AKAIS. All participants who identified themselves in the primary AKAIS study as HIV positive were included in my research.

Sociodemographic Characteristics of Respondents

Figure 17

Respondents' Gender



The bar chart in Figure 17 shows the total number of respondents for this study (N = 62; those who had tested positive for HIV and knew their status before the study). Of these 62 respondents, 51 (82.3%) were females, and 11 (17.7%) were males.

Table 6

Age Categories (Years) of the Respondents

		Age Freq (%)		
		Male (n)	Female (n)	Total (N)
Age category (years)	<30	0 (0.0)	14 (22.6)	14 (22.6)
	30-39	4 (6.5)	15 (24.2)	19 (30.6)
	40-49	3 (4.8)	12 (19.4)	15 (24.2)
	>49	4 (6.5)	10 (16.1)	14 (22.6)
Total		11 (17.7)	51 (82.3)	62 (100.0)
X^2		4.340		
p-value		0.227		

As shown in Table 6, in the study, respondents <30 years were 14 ([F = 14; M = 0] 22.6 %), 30-39 were 19 ([F = 15; M = 4] 30.6%), 40-49 were 15 ([F = 12; M = 3] 24.2%, >49 was 14 ([F = 10; M = 4] 22.6%). Pearson (X^2) was 4.340, while the p-value was 0.227. The Pearson Chi-square test for association (X^2) shows no significant association between gender and age ($p > 0.05$).

Figure 18

Ethnicity and Gender of Respondents

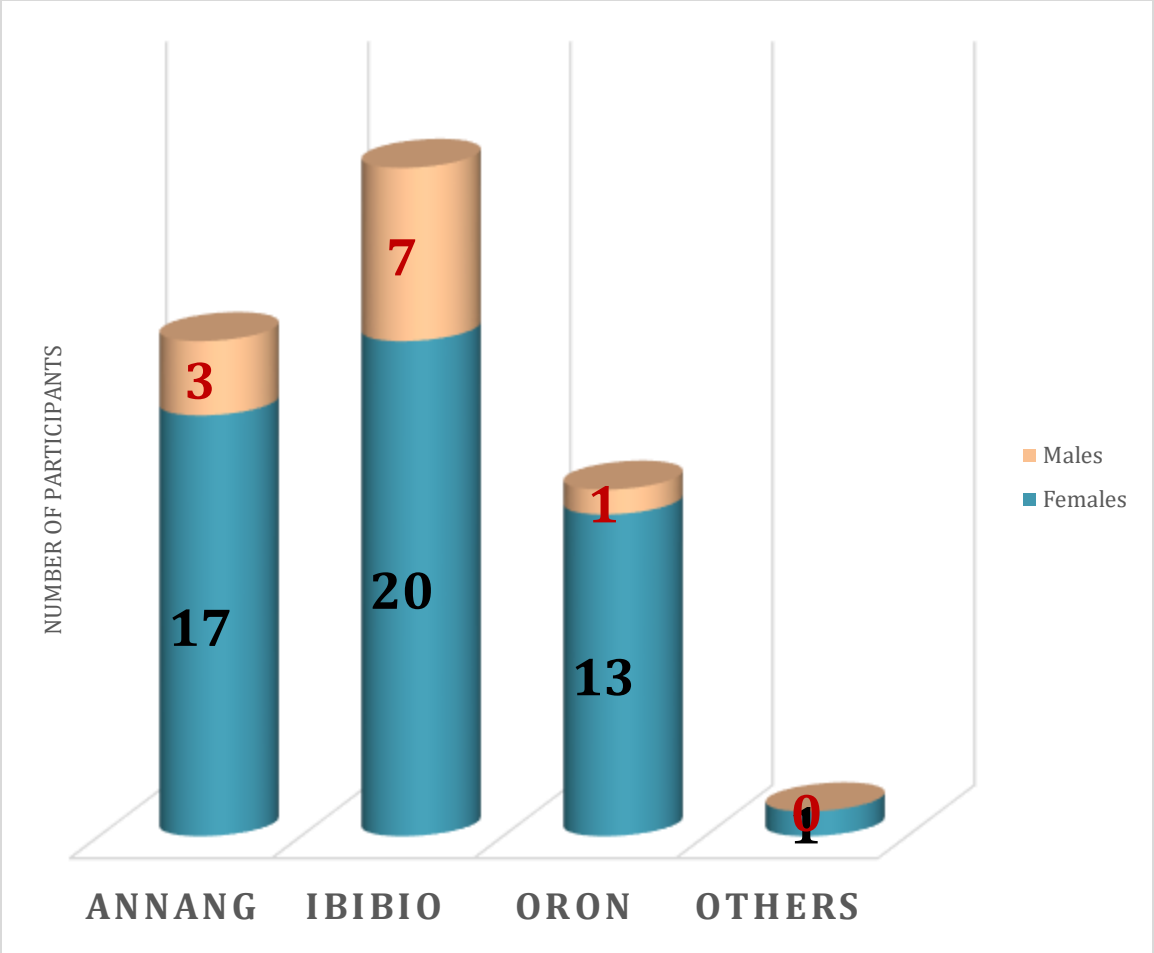
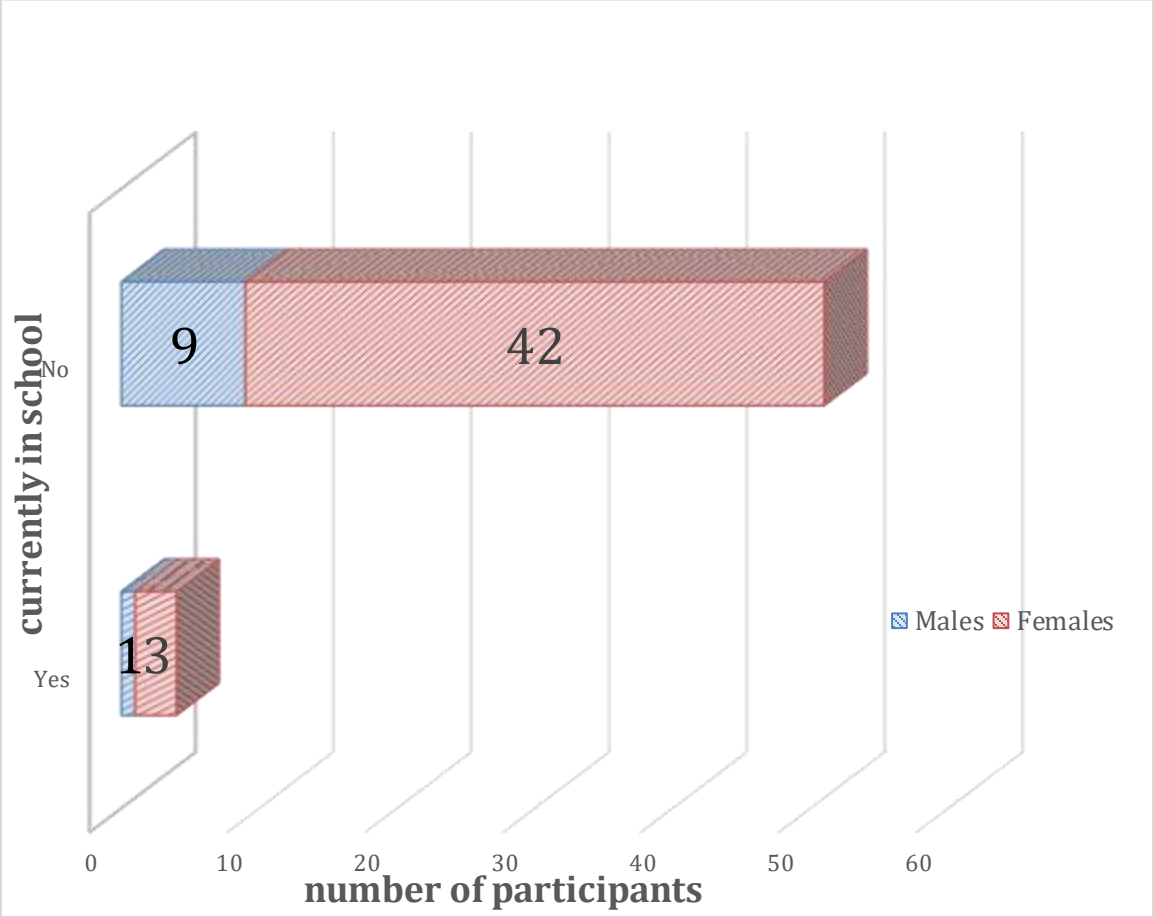


Figure 18 shows the ethnic spread of the respondents. The ethnic spread of the respondents was Annang 20 ([F = 17; M = 3] 32.3%), Ibibio 27 ([F = 20; M = 7] 43.5%), Oron 14 ([F = 13; M = 1] 22.6%), Others 1 ([F = 1; M = 0] 1.6%). Pearson (X^2) = 2.636, while p = 0.451. The test for association (X^2) shows no significant association between gender and ethnic group ($p > 0.05$).

Figure 19

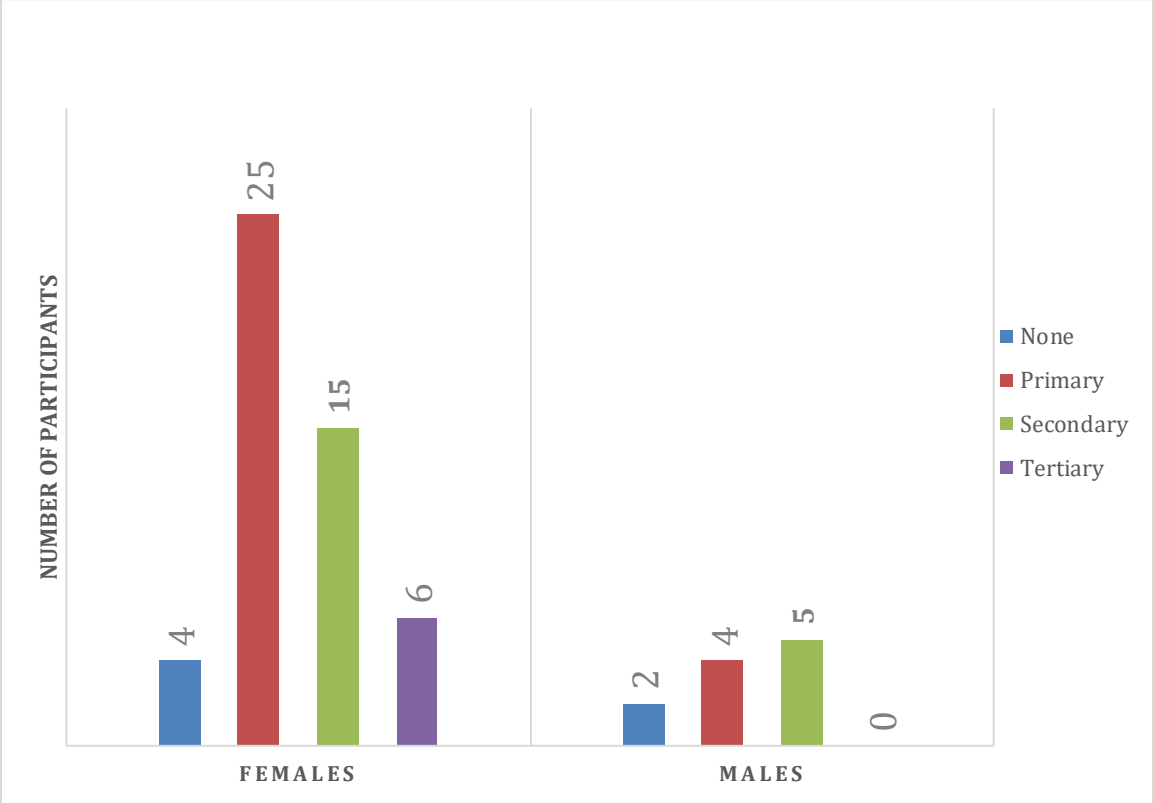
Current School Enrolment Status of Respondents



From the study (Figure 19), 4 respondents ([F = 3; M = 1] 7.3%) were enrolled in school, 51 ([F = 42; M = 9] 92.7%) were not. Pearson (X^2) was 0.135, while p = 0.714. Test for association (X^2) shows no significant association between gender and current school enrolment ($p > 0.05$).

Figure 20

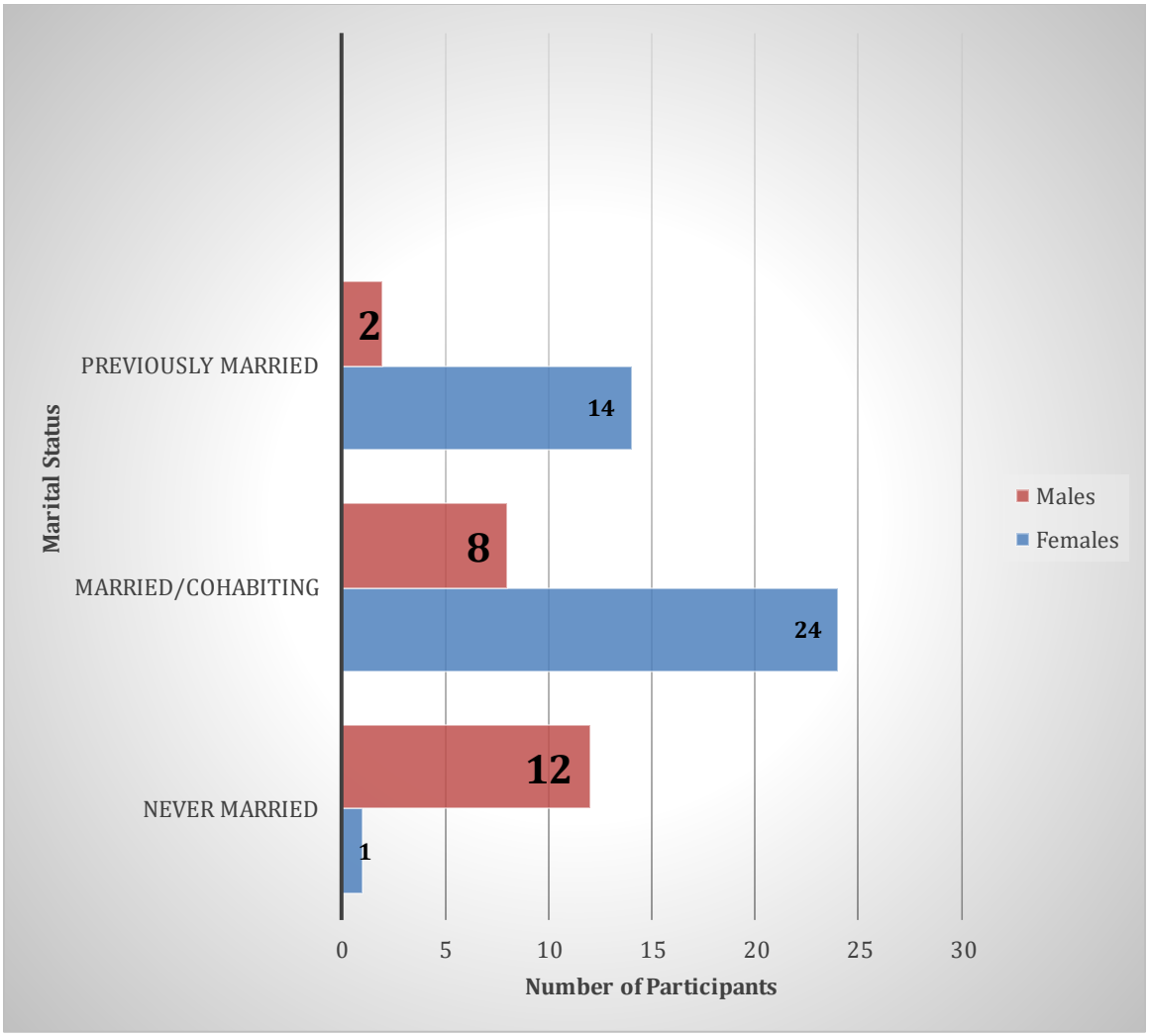
Educational Level of Respondents and Gender



The respondents' educational status (Figure 20) was distributed as follows: none 6 ([F = 4; M = 2] 9.8%), primary school 29 ([F = 25; M = 4] 47.5%), secondary school 20 ([F = 15; M = 5] 32.8%), tertiary institution 6 ([F = 6; M = 0] 6.9%). Pearson (X^2) = 3.280, while p = 0.350. The test for association (X^2) shows no significant association between gender and educational status (p > 0.05).

Figure 21

Marital Status of Respondents



From the sampled population (Figure 21), never married were 13 respondents representing ([F = 1; M = 12] 21.3%), married/cohabiting 32 respondents ([F = 24; M = 8] 42.5%), previously married 16 respondents ([F = 14; M = 2] 26.2%). Pearson (X^2) was 3.225, while the p-value was 0.358. Test for association (X^2) shows no significant association between gender and marital status ($p > 0.05$).

Figure 22

Participants Employed in the Past 12 Months

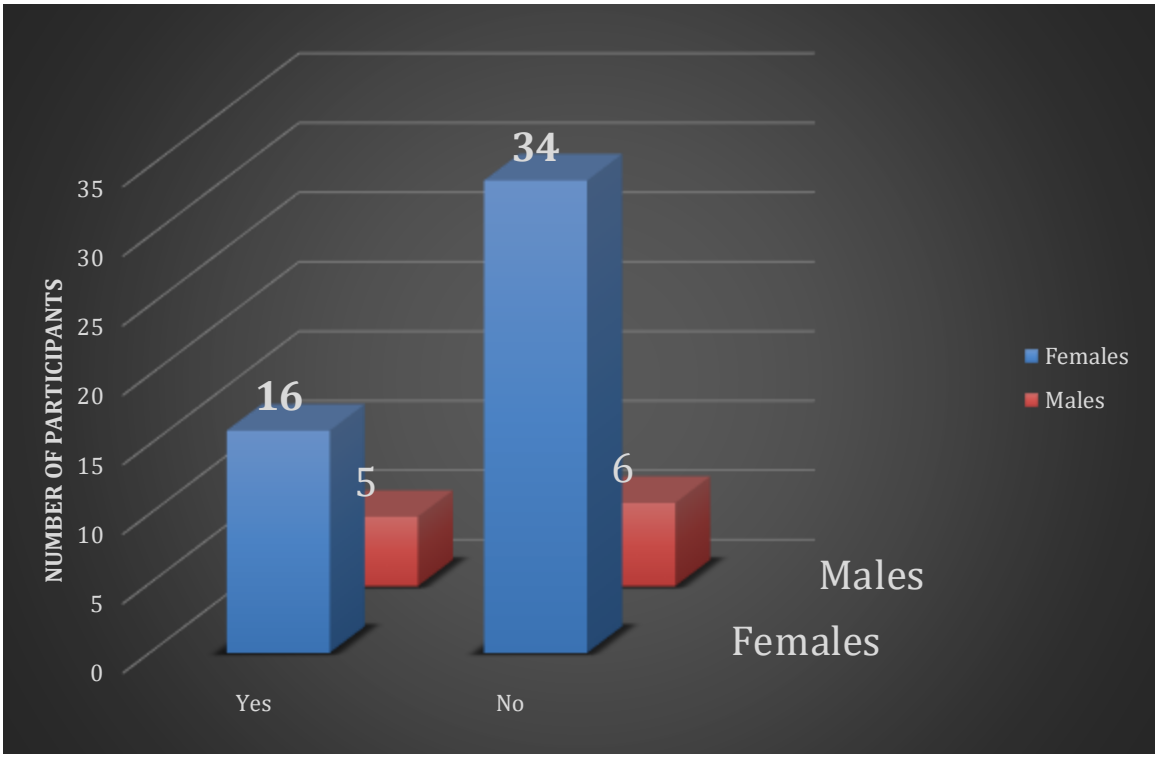


Figure 22 shows that among the participants, 40 respondents ([F = 34; M = 6] 65.6%) have not been employed in the past 12 months (before April to June 2016) for which payment was made in cash or kind. Twenty-one respondents ([F = 16; M = 5] 34.4%) have worked within the same period. Pearson (X^2) was 0.723, while p was 0.395. Test for association (X^2) shows no significant association between gender and employment in the last 12 months ($p > 0.05$).

Table 7

Occupation – Case Processing Summary

	Cases					
	Valid		Missing		Total	
	n	Percent	n	Percent	N	Percent
Occupation * record sex of the respondent	33	53.2%	29	46.8%	62	100.0%
Occupation * Knowledge	33	53.2%	29	46.8%	62	100.0%
Occupation * Attitude	33	53.2%	29	46.8%	62	100.0%

Table 8

Occupation Categories of Respondents

		Gender Freq (%)		
		Male (n)	Female (n)	Total (N)
Occupation	Others	2 (6.1)	15 (45.5)	17 (51.5)
	Self-employed	6 (18.2)	10 (30.3)	16 (48.5)
Total		8 (24.2)	25 (75.8)	33 (100.0)
X^2		2.972		
p-value		0.085		

Table 7 is the case processing summary for occupation. From Table 8, 16 respondents were self-employed, the highest occupation among the respondents whereas 17 respondents were in the other occupations. Pearson (X^2) was 2.972 and p-value was

0.085. Test for association (X^2) shows no significant association between gender and occupation (others and self-employed) ($p > 0.05$).

Table 9

Location of Respondents

Location	Gender Freq (%)		Total (N)
	Female (n)	Male (n)	
Urban	19 (30.6)	6 (9.7)	25 (40.3)
Rural	32 (51.6)	5 (8.1)	37 (59.7)
Total	51 (82.3)	11 (17.7)	62 (100.0)
X^2	1.124		
p-value	0.289		

In the study (Table 9), participants who resided in the urban area were 25 ([F = 19; M = 6] 40.3%), while those in the rural area were 37 ([F = 32; M = 5] 59.7%). Pearson (X^2) was 1.124, while the p-value was 0.289. The test for association (X^2) shows no significant association between gender and location ($p > 0.05$).

Knowledge Level and Attitude of Respondents

Table 10

Knowledge and Attitude of the Sampled Population by Gender

	Female Mean ±SD	Male Mean ±SD	T	p-value	95% confidence Interval Lower limits	Upper limits
Knowledge score	3.14 ±1.296	3.73 ±1.191	-1.387	0.171	-1.441	0.261
Attitude Score	3.76 ±1.64	4.00 ±1.095	-0.452	0.653	-1.277	0.806

The student t-test was used to compare the mean knowledge and mean attitude scores between male and female respondents in the study. Male respondents had higher mean knowledge and attitude scores (3.73 ±1.191 and 4.00 ±1.095) compared to the female respondents (3.14 ±1.296 and 3.76 ±1.64). However, no significant difference was observed in knowledge ($t = -1.387$, 95% CI [-1.441, 0.261], $p = 0.171$, and attitude ($t = -0.452$, 95% CI [-1.277, 0.806), $p = 0.653$, mean scores between the male and female respondents (Table 10).

Table 11

Estimating the Effect Size

				95% Confidence Interval	
		Standardizer[a]	Point Estimate	Lower limits	Upper limits
Knowledge score	Cohen's d	1.279	-.461	-1.116	.197
	Hedges' correction	1.296	-.455	-1.102	.195
	Glass' delta	1.191	-.495	-1.170	.201
Attitude score	Cohen's d	1.566	-.150	-.802	.503
	Hedges' correction	1.586	-.148	-.792	.496
	Glass' delta	1.095	-.215	-.868	.449

a. The denominator used in estimating the effect sizes.

Cohen's d uses the pooled standard deviation.

Hedges' correction uses the pooled standard deviation plus a correction factor.

Glass' delta uses the sample standard deviation of the control group.

According to Yockey (2011), the estimated values for effect size are 0.2, 0.5, and 0.8, corresponding to small, medium, and large effect sizes. A value of 0 indicates no association, and 1.0 indicates a very strong association. From Table 10, the values are 1.279 for the knowledge score and 1.566 for the attitude score. According to Laureate (2016), a value of 1.0 indicates a robust, perfect association (Table 11).

Knowledge Level of Respondents

Knowledge of HIV and its Association with Their Sociodemographic Status

Table 12

Case Processing for Knowledge

	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Gender* Knowledge	62	100.0%	0	0.0%	62	100.0%
Age category * Knowledge	62	100.0%	0	0.0%	62	100.0%
Edu status * Knowledge	61	98.4%	1	1.6%	62	100.0%

Table 13

Case Processing Summary

	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
record sex of the respondent * Knowledge	62	100.0%	0	0.0%	62	100.0%
Marital status * Knowledge	61	98.4%	1	1.6%	62	100.0%
Location * Knowledge	62	100.0%	0	0.0%	62	100.0%
What is your ethnic group/tribe? * Knowledge	62	100.0%	0	0.0%	62	100.0%

Tables 12 and 13 are the case processing summaries for knowledge of HIV by respondents based on sociodemographic characteristics.

Table 14

Knowledge Based on Gender

	Knowledge level Freq (%)		
Gender	Lack knowledge (n)	Have good knowledge (n)	Total (N)
Female	30 (48.4)	21 (33.9)	51 (82.3)
Male	5 (8.1)	6 (9.7)	11 (17.7)
Total	35 (56.5)	27 (43.5)	62 (100.0)
X^2		0.658	
p-value		0.417	

Table 14 showed no significant association between HIVK and gender. From the table (Table 14), 56.5% of respondents lacked knowledge of HIV, of which 48.4% were females and 8.1% were males. The table also shows that 43.5% of the respondents had good knowledge of HIV (F = 33.9%; M = 9.7%). Pearson X^2 was 0.658, while the p-value was 0.417. The test for association (X^2) shows no significant association between gender and HIVK ($p > 0.05$).

Table 15

Knowledge Based on Age Categories (Years)

		Knowledge		
		Lack knowledge (n)	Have good knowledge (n)	Total (N)
Age category (years)	<30	8 (12.9)	6 (9.7)	14 (22.6)
	30-39	9 (14.5)	10 (16.1)	19 (30.6)
	40-49	9 (14.5)	6 (9.7)	15 (24.2)
	>49	9 (14.5)	5 (8.1)	14 (22.6)
Total		35 (56.5)	27 (42.5)	62 (100)
X^2			1.067	
p-value			0.785	

From Table 15, among respondents who lacked knowledge of HIV, 12.9% were in the <30 years' category, 14.5% were in the 30-39 years' category, 14.5% were 40-49 years' category, while 14.5% were in >49 years' category. Age category 30-39 had the highest number of respondents with good knowledge of HIV, 16.1% (10), while the age category <30 years had the least knowledge at 12.9% (8). The table shows Pearson X^2 was 1.067, while the p-value was 0.785. There was no significant association between HIVK and Age ($p > 0.05$).

Table 16

Knowledge Based on Education Status

		Knowledge		
		Lack knowledge (n)	Have good knowledge (n)	Total (N)
Formal Education	No	5 (8.2)	2 (3.3)	7 (11.5)
	Yes	30 (49.2)	24 (39.3)	54 (88.5)
Total		35 (57.4)	26 (42.60	61 (100.0)
X^2			0.638	
p-value			0.424	

Table 16 showed that 8.2% of respondents with no formal education lacked knowledge of HIV, while 3.3% had good knowledge of HIV. Also, 49.2% with formal education lacked knowledge, while 39.3 had good knowledge of HIV. Pearson X^2 was 0.638, while the p-value was 0.424. No statistically significant association was observed between HIVK and the education status of respondents ($p > 0.05$).

Table 17

Knowledge Based on Education Level

	Knowledge Freq (%)		
Educational Level	Lack knowledge (n)	Have good knowledge (n)	Total (N)
None	5 (8.2)	2 (3.3)	7 (11.5)
Primary	17 (27.9)	10 (16.4)	27 (44.3)
Secondary	8 (13.1)	11 (18.0)	19 (31.3)
Tertiary	5 (8.2)	3 (4.9)	8 (13.1)
Total	35 (57.4)	26 (42.6)	61 (100.0)
X^2		2.807	
p-value		0.422	

Table 17 showed that 8.2% of respondents with no education lacked knowledge of HIV, 27.9% with primary education lacked knowledge, 13.1% with secondary education lacked knowledge, and 8.2% with tertiary education lacked knowledge. Respondents with secondary education had the highest knowledge level of HIV (18.0%), while respondents with No education (none) and tertiary education had the least/lowest knowledge of HIV at 8.2%. Pearson X^2 was 2.807, while the p-value was 0.422. No statistically significant association was observed between HIVK and educational level ($p > 0.05$).

Table 18

Knowledge Based on Employment in the Past 12 Months

		Attitude Freq (%)		
		Lack knowledge (n)	Have good knowledge (n)	Total (N)
Have you done any work in the last 12 months for which you received cash or in kind	No	24 (39.3)	16 (26.2)	40 (65.6)
	Yes	11 (18.0)	10 (16.4)	21 (34.4)
Total		35 (57.4)	26 (42.6)	61 (100)
X^2			0.327	
p-value			0.568	

Table 18 showed that 39.3% of respondents who did not work in the last 12 months for which compensation in cash or kind was given lacked knowledge of HIV, while 18.0% of respondents who worked in the last 12 months for which compensation in cash or kind was given lacked knowledge of HIV. Also, 26.2% of respondents who did not work in the last 12 months for compensation in cash or kind was given had good knowledge of HIV, whereas 16.4% of respondents who worked in the last 12 months for which compensation in cash or kind was given had good knowledge of HIV. Pearson X^2 was 0.327, while the p-value was 0.568. The Test for association (X^2) showed that there was a significant association between knowledge and occupation ($p > 0.05$).

Table 19

Knowledge Based on Occupation

		Knowledge Freq (%)		
		Lack Knowledge (n)	Have good Knowledge (n)	Total (N)
Occupation	Others	7 (21.2)	10 (30.3)	17 (51.5)
	Self-employed	12 (36.4)	4 (12.1)	16 (48.5)
Total		19 (57.6)	14 (42.48)	33 (100.0)
X^2		3.860		
p-value		0.049		

Table 19 showed that 21.2% of respondents with other occupation lacked knowledge, while 36.4% of the self-employed lacked knowledge of HIV. On the other hand, 30.3% identified as others had good knowledge, while 12.1% of self-employed had good knowledge. Pearson X^2 was 3.860, while the p-value was 0.049. The Test for association (X^2) showed that there was a significant association between knowledge and occupation ($p < 0.05$).

Table 20

Knowledge Based on Marital Status

	Knowledge Freq (%)		
	Lack Knowledge (n)	Have good Knowledge (n)	Total (N)
Never married	4 (6.6)	9 (14.8)	13 (21.3)
Married/cohabiting	21 (34.4)	11 (18.0)	32 (52.5)
Previously married	10 (16.4)	6 (9.8)	16 (26.2)
Total	35 (57.4)	26 (42.6)	61 (100)
X^2	8.825		
p-value	0.090		

Table 20 shows that 6.6% of respondents who never married lacked knowledge. For married/cohabiting, it was 34.4%, while previously married was 16.4%. On the contrary, 14.8% of never- married had good knowledge, 18.0% for married/cohabiting, and 9.8% for previously married. Pearson X^2 was 8.825, while the p-value was 0.090. The Test for association (X^2) showed that there was no significant association between knowledge and marital status ($p > 0.05$).

Table 21

Knowledge Based on Location

	Knowledge Freq (%)		
	Lack Knowledge (n)	Have good Knowledge (n)	Total (N)
Rural	21 (33.9)	16 (25.8)	37 (59.7)
Urban	14 (22.6)	11 (17.7)	25 (40.3)
Total	35 (56.5)	27 (43.5)	62 (100)
X^2		0.003	
p-value		0.953	

Table 21 shows that 33.9% of rural dwellers lacked knowledge, while 22.6% of urban dwellers lacked knowledge. Also, 25.8% and 17.7% of respondents who resided in rural and urban areas had good knowledge, respectively. Pearson X^2 was 0.003, while the p-value was 0.953. The Test for association (X^2) showed that there was no significant association between knowledge and location ($p > 0.05$).

Table 22

Knowledge Based on Ethnic Group

	Knowledge Freq (%)		
Ethnic group	Lack Knowledge (n)	Have good knowledge (n)	Total (N)
Annang	11 (17.7)	9 (14.5)	20 (20.0)
Ibibio	15 (24.2)	12(19.4)	27 (43.5)
Oron	9 (14.5)	5 (8.1)	14 (22.6)
Others	0 (0)	1 (1.6)	1 (1.6)
Total	35 (56.5)	27 (43.5)	62 (100)
X^2		1.672	
p-value		0.643	

Table 22 shows that 17.7% of respondents who identified as Annang lacked knowledge, while 14.5% from the same group/category had good knowledge of HIV. For Ibibio, it was 24.2% and 19.4% for lack of knowledge and good knowledge respectively. It was 14.5% for Oron for lack of knowledge and 8.1% for good knowledge. Others were 1.6% for good knowledge. Pearson X^2 was 1.672, while the p-value was 0.643. The Test for association (X^2) showed that there was no significant association between knowledge and ethnic group ($p > 0.05$).

Attitude of Respondents to HIV and its Association with their SDC

Table 23

Attitude of Respondents Based on Gender

	Attitude Freq (%)		
Gender	Negative (n)	Positive (n)	Total (N)
Female	20 (32.3)	31 (50.0)	51 (82.3)
Male	4 (6.5)	7 (11.3)	11 (17.7)
Total	24 (38.7)	38 (61.3)	62 (100.0)
X^2		0.031	
p-value		0.860	

Table 23 showed that 32.3% females had a negative attitude, while 6.5% of males had a negative attitude. Overall, 61.3% of respondents had a positive attitude. Pearson X^2 was 0.031, while the p-value was 0.860. There was no significant association between the attitude of respondents to HIV and gender ($p > 0.05$).

Table 24

Attitude and Education Status

		Attitude		
		Negative attitude	Positive attitude	Total
Formal Education	No	2 (3.3)	5 (8.2)	7 (7.7)
	Yes	22 (36.1))	32 (52.5)	54 (88.5)
Total		24 (39.3	37 (60.7)	61 (100)
X^2			0.385	
p-value			0.535	

From the study (Table 24), 3.3% of respondents with no formal education had a negative attitude toward HIV, while 8.2% had a positive attitude. Also, 36.1% of respondents with formal education had a negative attitude, whereas 52.5% had a positive attitude. Pearson X^2 was 0.385, while the p-value was 0.535. There was no significant association between the attitude of respondents to HIV and the education level of the respondents ($p > 0.05$).

Table 25

Attitude Based on Education Level

	Attitude Freq (%)		
	Negative (n)	Positive (n)	Total (N)
None	2 (3.3)	5 (8.2)	7 (11.5)
Primary	9 (14.8)	18 (29.5)	29 (44.3)
Secondary	9 (14.8)	10 (16.4)	19 (31.1)
Tertiary	4 (6.6)	4 (6.6)	8 (13.1)
Total	24 (39.3)	37 (60.7)	61 (100.0)
X^2		1.642	
p-value		0.650	

From the study (Table 25), 3.3% with no education had a negative attitude, 14.8% with primary and the same percentage for secondary education had a negative attitude. For tertiary education, 6.6% had negative, and the same percentage had a negative attitude toward HIV. Respondents with primary education had the highest positive attitude (29.5%). Pearson X^2 was 1.642, while the p-value was 0.650. There was no significant association between the attitude of respondents toward HIV and the education level of the respondents ($p > 0.05$).

Table 26

Attitude Based on Age Category (Years)

		Attitude Freq (%)		
		Negative (n)	Positive (n)	Total (N)
Age category (years)	<30	4 (6.5)	10(16.1)	14 (22.6)
	30-39	8 (12.9)	11(17.7)	19 (30.6)
	40-49	5 (8.1)	10(16.1)	15 (24.2)
	>49	7 (11.3)	7(11.3)	14 (22.6)
Total		24 (38.7)	38 (61.3)	62 (100)
X^2			1.634	
p-value			0.652	

Table 26 shows that for the age category <30, 6.5% had a negative attitude; age category 30-39, 12.9% had a negative attitude; age category 40-49, 8.1% had a negative attitude; category >49 was 11.3% with negative attitude. On the other hand, for the age category <30, 16.1% had a positive attitude; age category 30-39, 17.7%; age category 40-49, 16.1% had a positive attitude; age group >49 was 11.3%. Pearson X^2 was 1.634, while the p-value was 0.652. There was no significant association between the attitude of respondents to HIV and the age of the respondents ($p > 0.05$).

Table 27

Attitude Based on Marital Status

	Attitude Freq (%)		
Marital Status	Negative (n)	Positive (n)	Total (N)
Never married	7 (11.5)	6 (9.8)	13 (21.3)
Married/Cohabiting	11 (18.1)	21 (34.4)	32 (52.5)
Previously married	6 (9.8)	10 (16.4)	16 (26.2)
Total	24 (39.3)	37 (60.7)	61 (100.0)
X^2		1.718	
p-value		0.633	

Table 27 showed that never married respondents (11.5%) had a negative attitude, married/cohabiting (18.1%) had a negative attitude, and previously married (9.8%) had a negative attitude. For positive attitude, never married was 9.8%, married/cohabiting 34.4%, and previously married 16.4%. Pearson X^2 was 1.718, while the p-value was 0.633. There was no significant association between the attitude of respondents to HIV and marital status ($p > 0.05$).

Table 28

Attitude Based on Location

Location	Attitude Freq (%)		
	Negative (n)	Positive (n)	Total (N)
Urban	11 (17.7)	14 (22.6)	25 (40.3)
Rural	13 (21.0)	24 (8.7)	37 (59.7)
Total	24 (38.7)	38 (61.3)	62 (100.0)
X^2		0.494	
p-value		0.482	

From the results in Table 28, 17.7% of urban dwellers had a negative attitude, while 22.6% had a positive attitude. On the other hand, 21.0% of rural dwellers had a negative AHIV, and 8.7% had a positive attitude. Pearson X^2 was 0.494, while the p-value was 0.482. There was no significant association between the attitude of respondents to HIV and location ($p > 0.05$).

Table 29

Attitude and Employment in the Last 12 Months

		Attitude		
		Negative Attitude (n)	Positive Attitude (n)	Total (N)
Have you done any work in the last 12 months for which you received cash or in kind	No	15 (24.6)	25 (41.0)	40 (65.6)
	Yes	9 (14.8)	12 (19.7)	21 (34.4)
Total		24 (39.3)	37 (60.7)	61 (100)
X^2			0.166	
p-value			0.684	

From the study (Table 29), 24.6% of respondents who have worked in the last 12 months for which compensation in cash or kind was given had a negative attitude toward HIV, while 41.0% had a positive attitude. On the other hand, 14.8% of respondents who have worked in the last 12 months for which compensation in cash or kind was given had a negative attitude toward HIV, while 19.7% had a positive attitude. Pearson X^2 was 0.166, while the p-value was 0.684. Test for association (X^2) shows no significant association between AHIV and occupation of respondents ($p > 0.05$).

Table 30

Attitude Based on Occupation

		Attitude Freq (%)		
		Negative (n)	Positive (n)	Total (N)
Occupation	Other	7 (21.2)	10 (30.3)	17 (51.5)
	Self-employed	6 (18.2)	10 (30.3)	16 (48.5)
Total		13 (39.4)	20 (60.6)	33 (100.0)
X^2			0.047	
p-value			0.829	

From the study (Table 30), 21.2% of respondents employed under others had a negative attitude, while 18.2% of self employed had a negative attitude. For positive attitudes, 30.3% identified as others and self-employed had positive attitudes. Pearson X^2 was 0.047, while the p-value was 0.829. Test for association (X^2) shows no significant association between AHIV and occupation of respondents ($p > 0.05$).

Table 31

Attitude Based on Ethnic Group

	Attitude Freq (%)		
	Negative (n)	Positive (n)	Total (N)
Annang	12 (19.4)	8 (12.9)	20 (32.3)
Ibibio	10 (16.1)	17 (27.4)	27 (43.5)
Oron	2 (3.2)	12 (19.4)	14 (22.6)
Others	0 (0.0)	1 (1.6)	1 (1.6)
Total	24 (38.7)	38 (61.3)	62 (100.0)
X^2		8.005	
p-value		0.046	

Table 31 shows that 19.4% of respondents from Annang had a negative attitude, 16.1% from Ibibio had a negative attitude, and 3.2% from Oron had a negative attitude. Among respondents who identified their ethnicity as Annang, 12.9% had a positive attitude, 27.4% of Ibibio had a positive attitude, and 19.4 from Oron had a positive attitude. Pearson X^2 was 8.005, while the p-value was 0.046. Test for association (X^2) shows a significant association between attitude and Ethnic Group of the respondents ($p < 0.05$).

Assumptions and Hypotheses

Due to the dichotomous nature of the dependent variables, bivariate logistic regression was a suitable statistical analysis tool for investigating how the independent variables predicted the dependent variable. In order to use the bivariate logistic regression, certain assumptions must be met by the dataset (Laerd Statistics, 2023). The

dependent variable should be measured on a dichotomous scale (with two groups). In this study, the dependent variables RIC was coded as 1 for retained in care and 0 for not retained in care, MA coded as 1 for good adherence and 0 for poor adherence, and LC coded as Linked =1 or Not Linked = 0, thus, meeting assumption one.

Before using bivariate regression, the study, according to Laerd Statistics (2023), should have one or more independent variables, which can be either continuous (i.e., an interval or ratio variable) or categorical (i.e., an ordinal or nominal variable). In this study, there was one independent variable, Gender, which is nominal (male or female). The study should have independent observations with the dependent variables being mutually exclusive (both cannot occur simultaneously) and have exhaustive categories. The study did not use continuous independent variables, which met assumption number four, that there needs to be a linear association between any continuous independent variables and the logit transformation of the dependent variable.

Effect of Gender on Linkage to HIV Care

RQ1: Is there an association between gender and LC after controlling for SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV?

$H_0$1: There is no statistically significant association between gender and LC after controlling for SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV.

H_11: There is a statistically significant association between gender and LC after controlling for SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV.

Effect of Gender on Linkage to Care Controlling for SDC of Respondents

Table 32

Effects of Gender on Linkage

					Binary Logistic Regression			
Variable		Total (N)	*Not Linked (%)	Linked (%)	p-value	Odds ratio	Lower 95% CI	Upper 95% CI
Gender	*Males	11	4 (36.3)	7 (63.6)				
	Female	51	19 (37.2)	32 (62.7)	0.956	0.962	0.249	3.725
	Total	62	23 (37.0)	39 (62.9)				

*Reference category

Table 32 shows that females were not statistically significantly ($p = 0.956$) less likely to be linked to care than males (OR = 0.962, 95% CI [0.249, 3.725], $p = 0.956$). The total prevalence of respondents linked to HIV care was 62.9% (39 of 62). Male respondents not linked to care showed a prevalence rate of 36.3% (4 of 11) and female respondents was 37.2% (19 of 51). The prevalence of males linked to care was 63.6% (7 of 11), while females were 62.7% (32 of 51). The proportion of males linked to care compared to females was marginal. I failed to reject the null hypothesis and did not demonstrate evidence to accept the alternate hypothesis ($p > 0.05$).

Table 33

Effect of Gender on Linkage Controlling for Location

					Binary Logistic Regression			
Variable		Total (N)	*Not Linked (%)	Linked (%)	p-value	Odds ratio	Lower 95% CI	Upper 95% CI
Gender	Female	51	19 (37.2)	32 (62.7)	0.717	1.317	0.297	5.847
Location	*Rural	37	19 (51.3)	18 (48.6)				
	Urban	25	4 (16.0)	21 (84,0)	0.007	5.733	1.614	20.367
Total		62	23 (37.0)	39 (62.9)				

*Reference category

Table 33 shows that gender had no statistically significant effect on linkage at an alpha level of 0.05 after controlling for the location of the respondents (OR = 1.317, 95% CI [0.297, 5.847], p = 0.717). Location of residence was a statistically significant predictor of LC. Respondents who resided in urban areas were 5.733 (OR = 5.733, 95% CI [1.614, 20.367], p = 0.007) times more likely to be linked to care than those residents in rural areas. In addition, out of the 39 respondents linked to care, 18 were residents in rural areas, while 21 were urban residents. Of those not linked to care, 19 resided in rural areas, while four resided in urban areas. The prevalence of respondents linked to HIV care was 62.9% (39 of 62). The prevalence of urban dwellers linked to HIV care was 84.0% (21 of 25), whereas the prevalence of rural dwellers linked to HIV care was 48.6% (18 of 37). On the other hand, the prevalence of urban dwellers not linked to HIV care was 16.0% (4 of 25), whereas the prevalence of rural dwellers not linked to HIV was

51.3% (19 of 37). I can partially reject the null hypothesis in favor of the alternative for this particular result ($p < 0.05$).

Table 34

Effect of Gender on Linkage to Care Controlling for Age (Years)

					Binary Logistic Regression			
Variable		Total (N)	*Not Linked (%)	Linked (%)	p-value	Odds ratio	Lower 95% CI	Upper 95% CI
Gender	female				0.931	1.065	0.255	4.446
Age category (years)	*<30	14	6 (42.8)	8 (57.1)	0.633			
	30-39	19	5 (26.3)	14 (73.6)	0.324	2.129	0.474	9.565
	40-49	15	7 (46.6)	8 (53.3)	0.853	0.864	0.195	3.867
	>49	14	5 (35.7)	9 (64.2)	0.692	1.375	0.284	6.654
Total		62	23 (37.0)	39 (62.9)	0.805			.

*Reference category

As reflected in Table 34, the age of the respondents was not a statistically significant predictor of LC at alpha = 0.05, 30-39 years (OR = 2.129, 95% CI [0.474, 9.565], p = 0.324, 40 -49 years (OR = 0.864, 95% CI [0.195, 3.867], p = 0.853), >49 years (OR = 1.375, 95% CI [0.284, 6.654], p = 0.692). Gender had no statistically significant effect on LC after adjusting for age (OR = 1.065, 95% CI [0.255, 4.446], p = 0.931). Among those linked to care, respondents who fall within the age category 30-39 years were observed to have the highest prevalence rate of 73.6 (14 of 19), while age groups <30 and 40 - 49 had a prevalence of 57.1 and 53.3 (8 of 14 and 15) each. Age category >49 had a prevalence of 64.2% (9 of 14). The prevalence of known HIV

respondents not linked to care as categorized by age were: 42.8% % (6 of 14), 26.3% (5 of 19), 46.6% (7 of 15), and 35.7% (5 of 14) for age groups <30, 30-29, 40-49, >49 years respectively. I failed to reject the null hypothesis and did not demonstrate evidence to accept the alternate hypothesis ($p > 0.05$).

Table 35

Effect of Gender on Linkage Controlling for Educational Level

					Binary Logistic Regression			
Variable		Total (N)	*Not Linked (%)	Linked (%)	p-value	Odds ratio	Lower 95% CI	Upper 95% CI
Gender	Females				0.968	0.971	0.235	4.018
Education	*None	7	4 (57.1)	3 (42.8)	0.534			
	Primary	27	16 (59.2)	11 (40.7)	0.442	1.949	0.356	10.679
	Secondary	19	5 (26.3)	14 (73.6)	0.154	3.736	0.610	22.885
	Tertiary	8	3 (37.5)	5 (62.5)	0.450	2.233	0.278	17.943
Total		61	23 (37.7)	38 (62.2)				

*Reference category

Table 35 shows that females were not statistically significantly less likely to be linked to HIV care compared to males after controlling for educational level (OR = 0.971, 95% CI [0.235, 4.018], p = 0.968). Educational level has no statistically significant effect on linkage to HIV care. Primary (OR = 1.949, 95% CI [0.356, 10.679], p = 0.442), secondary (OR = 3.736, 95% CI [0.610, 22.885], p = 0.154). The prevalence rate of respondents not linked to HIV care who did not attend school (none) were: 57.1% (4 of 7), primary 59.2% (16 of 27), secondary 26.3% (5 of 19), and tertiary education 37.5% (3 of 8). The prevalence among those linked to HIV care for the same categories were:

42.8% (3 of 7), 40.7% (11 of 27), 73.6% (14 of 19), and 62.5% (5 of 8). There were no differences between any of these groups. I failed to reject the null hypothesis and did not demonstrate evidence to accept the alternate hypothesis ($p > 0.05$).

Table 36

Effect of Gender on Linkage Controlling for Educational Status

					Binary Logistic Regression			
Variable		Total (N)	*Not Linked (%)	Linked (%)	p-value	Odds ratio	Lower 95% CI	Upper 95% CI
Gender	Females				0.829	0.859	0.215	3.426
Formal	*No	7	4 (57.1)	3 (42.8)				
Education	Yes	54	19 (35.1)	35 (64.8)	0.264	2.503	0.501	12.506
Total		61	23 (37.7)	38 (62.2)				

*Reference category

From Table 36, females were not statistically significantly less likely to be linked to HIV care than the males subject after controlling for educational status (OR = 0.859, 95% CI [0.215, 3.426], p = 0.829). Respondents with formal education were not statistically significantly more likely to be linked to care as against those with no formal education (OR =2.503, 95% CI [0.501, 12.506], p = 0.264). The prevalence rate of respondents not linked to HIV care with no formal education was 57.1% (4 of 7), and those with formal education was 35.1% (19 of 54), while the prevalence of respondents linked to HIV care who had no formal education was 42.8% (3 of 7) and the ones with formal education was 64.8% (35 of 54). I failed to reject the null hypothesis and did not demonstrate evidence to accept the alternate hypothesis ($p > 0.05$).

Table 37

Effect of Gender on Linkage Controlling for Marital Status

					Binary Logistic Regression			
Variable		Total (N)	*Not Linked (%)	Linked (%)	p-value	Odds ratio	Lower 95% CI	Upper 95% CI
Gender	Females				0.856	0.880	0.220	3.515
Education	*Never married	13	5 (38.4)	8 (61.5)	0.809			
	Married/ cohabiting	32	13 (40.6)	19 (59.3)	0.869	0.894	0.233	3.421
	Previously married	16	5 (31.2)	11 (68.7)	0.691	1.367	0.293	6.374
Total		61	23 (37.7)	38 (62.2)				

*Reference category

In Table 37, females were not statistically significantly less likely to be linked to HIV care than the males subject after controlling for marital status (OR = 0.880, 95% CI [0.220, 3.515], p = 0.856). Married/cohabiting were not statistically significantly less likely to be linked to care as against those who were never married (OR = 0.894, 95% CI [0.233, 3.421], p = 0.869). In contrast, previously married respondents were not statistically significantly more likely to be linked to care than those who were never married (OR = 1.367, 95% CI [0.293, 6.374], p = 0.691). Among this category, females were also less likely to be linked to HIV care than males. The prevalence rates of respondents not linked to HIV care who were never married, married/cohabiting, and previously married were 38.4 % (5 of 13), 40.6% (13 of 32), and 31.2% (5 of 16),

respectively, while those linked to HIV care were 61.5% (8 of 13), 59.3% (19 of 32), and 68.7% (11 of 16) for never married, married/cohabiting, and previously married. I failed to reject the null hypothesis and did not demonstrate evidence to accept the alternate hypothesis ($p > 0.05$).

Table 38

Effect of Gender on Linkage Controlling for Employment in the Last 12 Months

					Binary Logistic Regression			
Variable		Total (N)	*Not Linked (%)	Linked (%)	p-value	Odds ratio	Lower 95% CI	Upper 95% CI
Gender	Females				0.885	1.111	0.266	4.640
Employed in last 12 months	*No	40	19 (47.5)	21 (52.5)				
	Yes	21	4 (19.0)	17 (80.9)	0.035	3.884	1.100	13.716
Total		61	23 (37.7)	38 (62.2)				

*Reference category

Table 38 shows that the females were not statistically significantly more likely to be linked to HIV care than male respondents (OR = 1.111, CI [0.266, 4.640], p = 0.885). Adjusting for employment status in the last 12 months, the respondents within this category were 3.88 times more likely to be linked to care than the unemployed respondents, which was statistically significant OR = 3.884, CI (1.100 and 13.716), p = 0.035. The prevalence of respondents who were not employed in the past 12 months and were not linked to care was 47.5% (19 of 40). The prevalence of respondents employed in the past 12 months and not linked to care was 19.0% (4 of 21). On the other hand, the prevalence of respondents who were not employed in the past 12 months and linked to

care was 52.5% (21 of 40), and those employed in the last 12 months and linked to care was 80.9% (17 of 21). I could reject the null hypothesis because the result showed evidence to accept the alternate hypothesis ($p < 0.05$).

Table 39

Effect of Gender on Linkage Controlling for Occupation

					Binary Logistic Regression			
Variable		Total (N)	*Not Linked (%)	Linked (%)	p-value	Odds ratio	Lower 95% CI	Upper 95% CI
Gender	Females				0.802	1.257	0.210	7.537
Occupation	Others	17	3 (17.6)	14 (82.3)				
	Self-employed	16	9 (56.2)	7 (43.7)	0.039	0.176	0.034	0.915
Total		33	12 (36.3)	21 (63.6)				

*Reference category

Table 39 shows that the females were not statistically significantly less likely to be linked to HIV care than the males controlling for occupation (OR = 1.257, 95% CI [0.210, 7.537], p = 0.802). However, occupation was a significant predictor of the linkage to HIV care. The odds of those who were self-employed being linked to HIV care decreased significantly by a factor of 0.176 (OR = 0.176, 95% CI [0.034, 0.915], p = 0.039) as against respondents in other occupations. The prevalence rate of respondents linked to HIV care for the self-employed respondents was 43.7% (7 of 16), and for others, it was 82.3% (14 of 17). The prevalence rate of those not linked to HIV care for the self-employed respondents was 56.2% (9 of 16), and for others, it was 17.6% (3 of

17). I could reject the null hypothesis because the result showed evidence to accept the alternate hypothesis ($p < 0.05$).

Table 40

Effect of Gender on Linkage Controlling for Ethnic Group of Respondents

				Binary Logistic Regression			
	Total (N)	*Not Linked (%)	Linked (%)	p-value	Odds ratio	Lower 95% CI	Upper 95% CI
*Females				0.977	0.980	0.244	3.931
*Annang	20	9 (45.0)	11 (55.0)	0.877			
Ibibio	27	9 (33.3)	18 (66.6)	0.423	1.633	0.492	5.418
Oron	14	5 (35.7)	9 (64.2)	0.589	1.475	0.361	6.031
Others	1	0 (0)	1 (100.0)	1.000	1325779874.789	0.000	.
Total	62	23(37.0)	39 (62.9)				

*Reference category

Table 40 shows that while controlling for the ethnic group of the respondents, gender was not a significant predictor of linkage (OR = 0.980, 95% CI [0.244, 3.931], p = 0.977). Respondents from Ibibio and Oron ethnic groups were not statistically significantly more likely to be linked to care (OR = 1.633, 95% CI [0.492, 5.418], p = 0.423), and (OR = 1.475, 95% CI [0.361, 6.031], p = 0.589), than the respondents from Annang. The Other ethnic group had no predictive effect on adherence (p = 1). The prevalence rates of respondents not linked in care were: 45.0% (9 of 20) for Annang, 33.3% (9 of 27) for Ibibio, 35.7% (5 of 14) for Oron, and 0.0% (0 of 1) for Other ethnic groups. The prevalence rates of respondents retained in care were: 55.0% (11 of 20) for Annang, 66.6% (18 of 27) for Ibibio, 64.2% (9 of 14) for Oron, and 100.0% (1 0f 1) for

Other ethnic groups. I failed to reject the null hypothesis and did not demonstrate evidence to accept the alternate hypothesis ($p > 0.05$)

Effect of Gender on Linkage Controlling for Respondents' Knowledge of HIV

Table 41

Effect of Gender Controlling for Knowledge of HIV

				Binary Logistic Regression			
Variable	Total (N)	* Not linked (%)	Linked (%)	p-value	Odds ratio	Lower 95% CI	Upper 95% CI
Gender (Female)				0.955	1.040	0.263	4.108
*Lack knowledge	35	15 (42.8)	20 (57.1)				
Have good knowledge	27	8 (29.6)	19 (70.3)	0.287	1.787	0.613	5.205
Total	62	23 (37.0)	39 (62.9)				

*Reference category

Table 41 shows that females were not significantly more likely to be linked to HIV care irrespective of their knowledge about HIV (OR = 1.040, 95% CI [0.263, 4.108], $p = 0.955$). The prevalence rate of respondents not linked to HIV care but with good knowledge about HIV was 29.6% (8 of 27), and prevalence rate for those who lacked knowledge and were not linked was 42.8% (15 of 35). On the other hand, 57.1% (20 of 35) of respondents linked to care lacked knowledge, while 70.3% (19 of 27) linked had good knowledge about HIV. I failed to reject the null hypothesis and did not demonstrate evidence to accept the alternate hypothesis ($p > 0.05$).

Effect of Gender on Linkage Controlling for AHIV

Table 42

Effect of Gender on Linkage Controlling for AHIV

				Binary Logistic Regression			
Variable	Total (N)	* Not linked (%)	Linked (%)	p-value	Odds ratio	Lower 95% CI	Upper 95% CI
Gender (Female)				0.957	0.963	0.249	3.729
*Negative attitude	24	9 (37.5)	15 (62.5)				
Positive attitude	38	14 (36.8)	24 (63.1)	0.959	1.028	0.357	2.959
Total	62	23 (37.0)	39 (62.9)				

*Reference category

Table 42 shows that females were not significantly less likely to be linked to HIV care irrespective of their attitude towards HIV (OR = 0.963, 95% CI [0.249, 3.729], p = 0.957). Increased but not statistically significant odds of being linked to HIV care were observed in respondents with a positive attitude (OR = 1.028, 95% CI [0.357, 2.959], p = 0.959) than in those with a negative attitude. The prevalence rate of respondents not linked to care but with a positive attitude was 36.8% (14 of 38). The prevalence rate of respondents not linked to HIV care but with a negative attitude was 37.5% (9 of 24). The prevalence rate of respondents linked to care but with a positive attitude was 63.1% (24 of 38). The prevalence rate of respondents linked to care but with a negative attitude was 62.5% (15 of 24). I failed to reject the null hypothesis and did not demonstrate evidence to accept the alternate hypothesis ($p > 0.05$).

Effect of Gender on Retention in HIV Care

RQ2: Is there an association between gender and HIV and retention after controlling for SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV?

$H_0$2: There is no statistically significant association between gender and HIV CR after controlling for SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV.

$H_1$2: There is a statistically significant association between gender and HIV CR after controlling SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV.

Effect of Gender on Retention in HIV Care Controlling for Sociodemographic

Table 43

Effect of Gender on Retention

					Binary Logistic Regression			
Variable		Total (N)	* Not retained (%)	Retained (%)	p-value	Odds ratio	Lower 95% CI	Upper 95% CI
Gender	*Males	11	9 (81.8)	2 (18.1)				
	Female	51	29 (56.8)	22 (43.1)	0.140	3.414	0.669	17.411
Total		62	38 (61.2)	24 (38.7)				

*Reference category

Table 43 shows that females were 3.414 times more likely to be retained in HIV care than males, but this was not statistically significant (OR = 3.414, 95% CI [0.669, 17.411], p = 0.140). The prevalence rate of females not retained in care was higher than

those retained in care (56.8%) 29 of 51 and (43.1%) 22 of 51, respectively, while their male counterparts were 81.8% (9 of 11) for not retained in care and 18.1% (2 of 11) for retained. I failed to reject the null hypothesis and did not demonstrate evidence to accept the alternate hypothesis ($p > 0.05$).

Table 44

Effect of Gender on Retention Controlling for Location

					Binary Logistic Regression			
Variable		Total (N)	* Not retained (%)	Retained (%)	p-value	Odds ratio	Lower 95% CI	Upper 95% CI
Gender	Female				0.147	3.365	0.653	17.326
Location	*Rural	37	22 (59.4)	15 (40.5)				
	Urban	25	16 (64.0)	9 (36.0)	0.875	0.917	0.313	2.689
Total		62	38 (61.2)	24 (38.7)				

*Reference category

Table 44 reveals that gender was not a statistically significant predictor of retention to HIV care controlling for the location of residence. The odds of females being retained in HIV care were higher than the males but not statistically significant (OR = 3.365, 95% CI [0.653, 17.326], $p = 0.147$). Study participants residing in urban areas were less likely to be retained in HIV care, albeit not statistically significant (OR = 0.917, 95% CI [0.313, 2.689], $p = 0.875$). Among those retained to HIV care, the prevalence rates were: 40.5% (15 of 37) for rural dwellers and 36.0% (9 of 25) for urban dwellers. Furthermore, for the respondents not retained in care, it was 59.4% (22 of 37) for rural

and 64.0% (16 of 25) for urban. I failed to reject the null hypothesis and did not demonstrate evidence to accept the alternate hypothesis ($p > 0.05$).

Table 45

Effect of Gender on Retention in HIV Care Controlling for Age (Years)

					Binary Logistic Regression			
Variable		Total (N)	* Not retained (%)	Retained (%)	p-value	Odds ratio	Lower 95% CI	Upper 95% CI
Gender	Female				0.146	3.458	0.649	18.426
Age (years)	*<30	14	8 (57.1)	6 (42.8)	0.959			
	30-39	19	11 (57.8)	8 (42.1)	0.787	1.219	0.291	5.113
	40-49	15	10 (66.6)	5 (33.3)	0.739	0.814	0.175	3.781
	>49	14	9 (64.2)	5 (35.7)	1.000	1.000	0.206	4.848
Total		62	38 (61.2)	24 (38.7)				

*Reference category

Table 45 shows that neither gender nor age was a statistically significant predictor of retention to HIV care. Females were not significantly more likely to be retained in HIV care than males. Also compared to the < 30 years' age category, other age categories had no significant predictive effect on CR 30-39 years (OR = 1.219, 95% CI [0.291, 5.113], p = 0.787); 40 - 49 years (OR = 0.814, 95% CI [0.175, 3.781], p = 0.739); >49 (OR = 1.000, 95% CI [0.206 and 4.848], p = 1.000). The prevalence rates of respondents not retained in care as categorized by age were: <30 = 57.1% (8 of 14); 30-39 = 57.8% (11 of 19), 40-49 = 66.6% (10 of 15), and >49 = 64.2% (9 of 14). For those retained in care, the prevalence rates were: >30 = 42.8% (6 of 14), 30-39 = 42.1% (8 of 19), 40-49 = 33.3% (5

of 15), and >49 =35.7% (5 of 14). I failed to reject the null hypothesis and did not demonstrate evidence to accept the alternate hypothesis ($p > 0.05$).

Table 46

Effect of Gender on Retention in HIV Care Controlling for Educational Level

					Binary Logistic Regression			
Variable		Total (N)	* Not Retained (%)	Retained (%)	p-value	Odds ratio	Lower 95% CI	Upper 95% CI
Gender	Females				0.085	4.409	0.814	23.880
Education	*None	7	4 (57.1)	3 (42.8)	0.622			
	Primary	27	18 (66.6)	9 (33.3)	0.471	0.519	0.087	3.087
	Secondary	19	10 (52.6)	9 (47.3)	0.858	1.182	0.190	7.355
	Tertiary	8	5 (62.5)	3 (37.5)	0.681	0.637	0.074	5.480
Total		61	37 (60.6)	24 (39.3)				

*Reference category

In Table 46, females were not statistically significantly more likely to be retained in care than males controlling for educational status. In addition, the educational level of respondents was not a significant predictor of HIV CR. Primary (OR = 0.519, 95% CI [0.087, 3.087], p = 0.471), secondary (OR = 1.182, 95% CI [0.190, 7.355], p = 0.858), and tertiary (OR = 0.637, 95% CI [0.074, 5.480], p = 0.681). The prevalence rates for respondents with no education and not retained in care were 57.1% (4 of 7) for none, primary education 66.6% (18 of 27), secondary 52.6% (10 of 19), and tertiary education level 62.5% (5 of 8). For respondents retained in care: none = 42.8% (3 of 7), primary = 33.3% (9 of 27), secondary 47.3% (9 of 19), and tertiary was 37.5% (3 of 8). Among those not retained in care, the highest prevalence was among primary-level educated

respondents (66.6%), while the highest retained prevalence (47.3%) was among secondary-level educated respondents. I failed to reject the null hypothesis and did not demonstrate evidence to accept the alternate hypothesis ($p > 0.05$).

Table 47

Effect of Gender on Retention in HIV Care Controlling for Educational Status

					Binary Logistic Regression			
Variable		Total (N)	* Not Retained (%)	Retained (%)	p-value	Odds ratio	Lower 95% CI	Upper 95% CI
Gender	Females				0.123	3.645	0.705	18.846
Formal Education	*No	7	4 (57.1)	3 (42.8)				
	Yes	54	33 (61.1)	21 (38.8)	0.708	0.728	0.139	3.829
Total		61	37 (60.6)	24 (39.3)				

*Reference category

Table 47 shows that respondents with formal education were statistically significantly less likely to be retained in HIV care than those without formal education (OR = 0.728, 95% CI [0.139, 3.829], p = 0.708). After adjusting for educational status, females were not statistically significantly more likely to be retained in HIV care than males (OR = 3.645, 95% CI [0.705, 18.846], p = 0.123). The prevalence rates for respondents who were not retained in care and had no formal education were 57.1% (4 of 7), while those not retained in care but had formal education were 61.1% (33 of 54). For those retained, the prevalence rate for respondents with no formal education were 42.8% (3 of 7) and 38.8% (21 of 54) for respondents with formal education. I failed to reject the

null hypothesis and did not demonstrate evidence to accept the alternate hypothesis ($p > 0.05$).

Table 48

Effect of Gender on Retention in HIV Care Controlling for Marital Status

					Binary Logistic Regression			
Variable		Total (N)	* Not Retained (%)	Retained (%)	p-value	Odds ratio	Lower 95% CI	Upper 95% CI
Gender	Females				0.157	3.292	0.632	17.157
Education	*Never married	13	7 (53.8)	6 (46.1)	0.858			
	Married/ cohabiting	32	21 (65.6)	11 (34.3)	0.636	0.723	0.189	2.768
	Previously married	16	9 (56.2)	7 (43.7)	0.950	0.953	0.215	4.231
Total		61	37 (60.6)	24 (39.3)				

*Reference category

Data from Table 48 reveals that gender was not a significant predictor of HIV CR after controlling for marital status (OR = 3.292, 95% CI [0.632, 17.157], p = 0.157). The result also shows that respondents who were previously married were not statistically significantly less likely to be retained in care as against those who were never married. The prevalence rate for respondents who were never married and not retained in care was 53.8% (7 of 13), married/cohabiting was 65.6% (21 of 32), and previously married was 56.2% (9 of 16). The prevalence rate for respondents who were never married and retained in HIV care was 46.1% (6 of 13), married/cohabiting was 34.3% (11 of 32), and

previously married was 43.7% (7 of 16). I failed to reject the null hypothesis and did not demonstrate evidence to accept the alternate hypothesis ($p > 0.05$).

Table 49

Effects of Gender on Retention Controlling for Employment in the Last 12 Months

					Binary Logistic Regression			
Variable		Total (N)	* Not Retained (%)	Retained (%)	p-value	Odds ratio	Lower 95% CI	Upper 95% CI
Gender	Females				0.117	3.730	0.719	19.361
Employed in last 12 months	*No	40	25 (62.5)	15 (37.5)				
	Yes	21	12 (57.1)	9 (42.8)	0.550	1.404	0.461	4.273
Total		61	37 (60.6)	24 (39.3)				

*Reference category

Table 49 shows no statistically significant predictive effect of gender controlling for employment in the last 12 months on retention to HIV care at an alpha level of 0.05. Females were not statistically significantly more likely to be retained in HIV care than males (OR = 3.370, 95% CI [0.719, 19.361], p = 0.117). Respondents employed for the past 12 months were not significantly more likely to be retained in care (OR = 1.404, 95% CI [0.461, 4.273], p = 0.550. The prevalence rate for respondents not employed in the last 12 months and not retained in care was 62.5% (25 of 40), and for respondents employed in the last 12 months and not retained in care was 57.1% (12 of 21). The prevalence rate for respondents not employed in the last 12 months and retained was 37.5% (15 of 40), and for respondents employed in the last 12 months and retained was

42.8% (9 of 21). I failed to reject the null hypothesis and did not demonstrate evidence to accept the alternate hypothesis ($p > 0.05$).

Table 50

Effect of Gender on Retention Controlling for Occupation

					Binary Logistic Regression			
Variable		Total (N)	* Not retained (%)	Retained (%)	p-value	Odds ratio	Lower 95% CI	Upper 95% CI
Gender	Females				0.469	1.985	0.310	12.718
Occupation	*Others	17	9 (52.9)	8 (47.0)				
	Self-employed	16	11 (68.7)	5 (31.2)	0.499	0.599	0.136	2.645
Total		33	20 (60.6)	13 (39.3)				

*Reference category

Table 50 shows that when controlling for occupation, females were not statistically significantly more likely to be retained in HIV care (OR 1.985, 95% CI [0.310 and 12.718], $p = 0.469$). Self-employed participants were less likely to be retained in care than respondents in other occupations (OR = 0.499, 95% CI [0.136, 2.645], $p = 0.499$). The prevalence rate of self-employed respondents who were not retained in care was 68.7% (11 of 16), and self-employed who retained was 31.2 % (5 of 16). For respondents in other occupations, not retained in care was 52.9% (9 of 17), and those retained in HIV care was 47.0% (8 of 17). I failed to reject the null hypothesis and did not demonstrate evidence to accept the alternate hypothesis ($p > 0.05$).

Table 51

Effect of Gender on Retention Controlling for Ethnic Group of Respondents

				Binary Logistic Regression			
	Total (N)	*Not retained (%)	Retained (%)	p-value	Odd ratio	Lower 95% CI	Upper 95% CI
Females				0.155	3.420	0.628	18.628
*Annang	20	16 (80.0)	4 (20.0)	0.201			
Ibibio	27	16 (59.2)	11 (40.7)	0.098	3.194	0.809	12.620
Oron	14	6 (42.8)	8 (57.1)	0.038	5.102	1.095	23.775
Others	1	0	1 (100.0)	1.000	5670461519.683	0.000	.
Total	62	38 (61.2)	24 (38.7)				

*Reference category

Table 51 shows that while controlling for the ethnic group of the respondents, gender was not a significant predictor of retention (OR = 3.420, 95% CI [0.628, 18.628], p = 0.155). Respondents from Ibibio ethnic group were not statistically significantly more likely to be retained in care (OR = 3.194, 95% CI [0.809, 12.620], p = 0.098), while respondents from Oron were 5.1 times significantly more likely to be retained in care than the respondents from Annang (OR = 5.102, 95% CI [1.095, 23.775], p = 0.038). The other ethnic group had no predictive effect on adherence (p = 1). The prevalence of respondents not retained in care was 80.0% (16 of 20) for Annang, 59.2% (16 of 27) for Ibibio, 42.8% (6 of 14) for Oron, and 0.0% (0 of 1) for Other ethnic groups. The prevalence of respondents retained in care were: 20.0% (4 of 20) for Annang, 40.7% (11

of 27) for Ibibio, 57.1% (8 of 14) for Oron, and 100.0% (1 0f 1) for other ethnic groups. I can partially reject the null hypothesis in favor of the alternative for this result ($p < 0.05$).

Effect of Gender on Retention in HIV Care After Controlling for HIVK

Table 52

Effect of Gender on Retention Controlling for Knowledge of HIV

				Binary Logistic Regression			
Variable	Total (N)	* Not retained (%)	Retained (%)	p-value	Odds ratio	Lower 95% CI	Upper 95% CI
Gender (Female)				0.131	3.542	0.687	18.271
*Lack knowledge	35	22 (62.8)	13 (37.1)				
Have good knowledge	27	16 (59.2)	11 (40.7)	0.647	1.281	0.445	3.689
Total	62	38 (61.2)	24 (38.7)				

*Reference category

Table 52 shows that gender, controlling for knowledge was not a significant predictor of retention to HIV care (OR = 3.542, 95% CI [0.687, 18.271], p = 0.131). The respondents who have good knowledge about HIV were not statistically significantly more likely to be retained in HIV care than those who lacked knowledge (OR = 1.281, 95% CI [0.445, 3.689], p = 0.647). The prevalence rate of respondents retained in care with good knowledge of HIV was 40.7% (11 of 27), and those who lacked knowledge but retained was 37.1% (13 of 35). Respondents not retained in care but with good knowledge had a prevalence of 59.2% (16 of 27), and those lacking knowledge about

HIV and not retained was 62.8% (22 of 35). I failed to reject the null hypothesis and did not demonstrate evidence to accept the alternate hypothesis ($p > 0.05$).

Effect of Gender on Retention in HIV Care after Controlling for Attitude

Table 53

Effect of Gender on Retention Controlling for AHIV

				Binary Logistic Regression			
Variable	Total * Not (N)	retained (%)	Retained (%)	p-value	Odds ratio	Lower 95% CI	Upper 95% CI
Gender (Female)				0.112	3.909	0.726	21.032
* Negative Attitude	24	19 (79.1)	5 (20.8)				
Positive attitude	38	19 (50.0)	19 (50.0)	0.021	4.097	1.235	13.593
Total	62	38 (61.2)	24 (38.7)				

*Reference category

Table 53 shows that the odds of females being retained in HIV care controlling for attitude increase by a factor of 3.909, but this was not statistically significant (OR = 3.909, 95% CI [0.726, 21.032], $p = 0.112$). The respondents with a positive attitude were 4.097 significantly more likely to be retained in HIV care than those with a negative attitude (OR = 4.097, 95% CI [1.235 and 13.593], $p = 0.021$). The prevalence rates for respondents retained in HIV care, and those not retained in care but had a positive attitude were 50.0% (19 of 38 each). The prevalence rate for respondents not retained in HIV care with a negative attitude was 79.1% (19 of 24), and retained in care but with a negative attitude was 20.8% (5 of 24). I could reject the null hypothesis because the result showed evidence to accept the alternate ($p < 0.05$).

Effect of Gender on Adherence to HIV Medication

RQ3: Is there an association between gender and HIV MA after controlling for socio-demographic characteristics (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV?

$H_0$3: There is no statistically significant association between gender and HIV MA after controlling for SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV.

$H_1$3: There is a statistically significant association between gender and HIV MA after controlling for SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV.

The question addressing adherence was Q 811: "Have you ever taken ARVs?" (Adedokun et al., 2020, p. S1 Appendix). Only respondents who answered yes were included. A respondent could only adhere to a therapy he or she had started.

Table 54

Effect of Gender on Adherence to HIV Medication

					Binary Logistic Regression			
Variable		Total (N)	* Poor Adherence (%)	Good Adherence (%)	p-value	Odds ratio	Lower 95% CI	Upper 95% CI
Gender	*Males	7	3 (42.8)	4 (57.1)				
	Female	32	11 (34.3)	21 (65.6)	0.140	3.414	0.669	17.411
Total		39	14 (35.8)	25 (64.1)				

Table 54 shows that gender was not a significant predictor of AHIV medication. Females were 3.414 times more likely to have good adherence than males, but this was not statistically significant (OR = 3.414, 95% CI [0.669, 17.411], p = 0.140). The prevalence rate of females with good adherence was 65.6% (21 of 32), and males with good adherence were 57.1% (4 of 7). For females with poor adherence, the prevalence was 34.3% (11 of 32) and 42.8% (3 of 7) for males. I failed to reject the null hypothesis and did not demonstrate evidence to accept the alternate hypothesis (p > 0.05).

Effect of Gender on Adherence to HIV Medication after Controlling for SDC of Respondents.

Table 55

Effect of Gender on Adherence Controlling for Location

					Binary Logistic Regression			
Variable		Total (N)	* Poor Adherence (%)	Good Adhered (%)	p-value	Odds ratio	Lower 95% CI	Upper 95% CI
Gender	Female				0.665	1.447	0.272	7.701
Location	*Rural	23	9 (39.1)	14 (60.8)				
	Urban	16	5 (31.2)	11 (68.7)	0.608	1.424	0.368	5.507
Total		39	14 (35.8)	25 (64.1)				

*Reference category

Table 55 reveals that gender was not a statistically significant predictor of MA controlling for the location of respondents. The odds of females adhering to HIV medication increased by a factor of 1.447 (OR = 1.447, 95% CI [0.272, 7.701], p = 0.665). Study participants residing in urban areas were not statistically significantly more

likely to have good AHIV medication (OR = 1.424, 95% CI [0.368, 5.507], p = 0.608) than those in rural areas. The prevalence rate of rural dwellers with poor adherence to HIV medication was 39.1% (9 of 23), while those with good adherence from the same area had a prevalence of 60.8% (14 of 23). Among the residents in urban areas, the prevalence was 31.2% (5 of 16) for poor adherence and 68.7% (11 of 16) for good adherence. I failed to reject the null hypothesis and did not demonstrate evidence to accept the alternate hypothesis (p > 0.05).

Table 56

Effect of Gender on Adherence Controlling for Age (Years)

					Binary Logistic Regression			
Variable			* Poor Adherence (%)	Good Adherence (%)	p-value	Odds ratio	Lower 95% CI	Upper 95% CI
Gender	Female				0.867	1.164	0.195	0.941
Age categories (years)	*<30	10	3 (30.0)	7 (70.0)	0.922			
	30-39	12	4 (33.3)	8 (66.6)	0.891	0.880	0.140	5.510
	40-49	6	2 (33.3)	4 (66.6)	0.909	0.880	0.980	7.881
	>49	11	5 (45.4)	6 (54.5)	0.533	0.544	0.800	3.690
Total (N)		39	14 (35.8)	25 (64.1)				

*Reference category

Table 56 shows that gender, while controlling for the age of the respondents, was not a predictor of MA (OR = 1.164, 95% CI [0.195, 0.941], p = 0.867). For age category 30-39 (OR 0.880, 95% CI [0.140 and 5.510], p = 0.891; For 40-49 (OR 0.880, 95% CI [0.980 and 7.881], p = 0.909), Category >49 (OR = 0.544, 95% CI [0.800, 3.690], p =

0.533). Prevalence rates based on age groups for good adherence were: <30 = 70.0% (7 of 10), 30-39 and 40-49 = 66.6% for (8 of 12 and 4 of 6), and >49 = 54.5% (6 of 11). The prevalence rate of the age group with poor adherence were: <30 = 30.0% (3 of 10), 30-39 and 40-49 = 33.3% (4 of 12 and 2 of 6), >49 = 45.4% (5 of 11). I failed to reject the null hypothesis and did not demonstrate evidence to accept the alternate hypothesis ($p > 0.05$).

Table 57

Effect of Gender on Adherence Controlling for Educational Level

					Binary Logistic Regression			
Variable		Total	* Poor Adherence (%)	Good Adherence (%)	p-value	Odds ratio	Lower 95% CI	Upper 95% CI
Gender	Females				0.647	1.511	0.259	8.813
Education	*None	2	0 (0.0)	2 (100.0)	0.508			
	Primary	16	5 (31.2)	11 (68.7)	0.999	0.000	0.000	.
	Secondary	16	6 (37.5)	10 (62.5)	0.999	0.000	0.000	.
	Tertiary	4	3 (75.0)	1 (25.00)	0.999	0.000	0.000	.
Total (N)		38	14 (36.8)	24 (63.1)				

*Reference category

Table 57 shows that gender while controlling for respondents' educational level, was not a significant predictor of MA. After controlling for educational levels, females were more likely to have good AHIV medications than males. However, this was not statistically significant (OR = 1.511, 95% CI [0.259, 8.813], p = 0.647). No significant difference in MA was observed in the subjects who attained only primary, secondary, or tertiary educational level than those with none (OR = 0.000, p = 0.999). The prevalence rate for respondents with none education and with poor adherence was 0.0% (0 of 2),

primary with poor adherence 31.2% (5 of 16), secondary with poor adherence 37.5% (6 of 16), and tertiary education 75.0% (3 of 4). The prevalence rate for respondents with none education and good adherence was 100% (2 of 2), primary with good adherence 68.7% (11 of 16), secondary with good adherence 62.5% (10 of 16), and tertiary education 25.0% (1 of 4). I failed to reject the null hypothesis and did not demonstrate evidence to accept the alternate hypothesis ($p > 0.05$).

Table 58

Effect of Gender on Adherence Controlling for Educational Status

					Binary Logistic Regression			
Variable		Total	* Poor Adherence (%)	Good Adherence (%)	p-value	Odds ratio	Lower 95% CI	Upper 95% CI
Gender	Females				0.123	0.811	1.227	0.230
Formal	*No	2	0 (0)	2 (100)				
Education	Yes	36	14 (38.8)	22 (61.1)	0.708	0.999	0.000	0.000
Total (N)		38	14 (38.8)	24 (63.1)				

*Reference category

Table 58 shows that respondents with formal education were statistically significantly less likely to have good MA than those without formal education (OR = 0.999, 95% CI [0.000, 0.000], p = 0.708). After adjusting for educational status, females were not statistically significantly less likely to adhere to HIV medication than males (OR = 0.811, 95% CI [1.227, 0.230], p = 0.123). The prevalence rate of respondents with poor adherence who had no formal education was 0.0% (0 of 2), and those with formal education was 38.8% (14 of 36), while those with good adherence but no formal

education was 100.0% (2 of 2) and with formal education was 61.1% (22 of 36). I failed to reject the null hypothesis and did not demonstrate evidence to accept the alternate hypothesis ($p > 0.05$).

Table 59

Effect of Gender on Adherence Controlling for Marital Status

					Binary Logistic Regression		
Variable	Total	* Poor Adherence (%)	Good Adherence (%)	p-value	Odds ratio	Lower 95% CI	Upper 95% CI
Gender Females				0.829	1.209	0.217	6.717
*Never married	11	3 (27.2)	8 (72.7)	0.524			
Married/ cohabiting	17	8 (47.0)	9 (52.9)	0.321	0.433	0.083	2.259
Previously married	10	3 (30.0)	7 (70.0)	0.908	0.894	0.133	6.009
Total (N)	38	14 (36.8)	24 (63.1)				

*Reference category

Table 59 shows that females were not statistically significantly more likely to have good MA than males adjusting for marital status (OR = 1.209, 95% CI [0.217, 6.717], p = 0.829). The married/cohabiting respondents or those previously married were statistically significantly less likely to have good AHIV medication than those who were never married. The prevalence rates of respondents with poor MA who were never married, married/cohabiting, and previously married were: 27.2% (3 of 11), 47.0% (8 of 17), and 30.0% (3 of 10) respectively, while those with good HIV MA were 72.7% (8 of 11) never married, 52.9% (9 of 17) married/cohabiting, and 70.0% (7 of 10) previously

married. I failed to reject the null hypothesis and did not demonstrate evidence to accept the alternate hypothesis ($p > 0.05$).

Table 60

Effect of Gender on Adherence Controlling for Employment in the Last 12 Months

					Binary Logistic Regression			
Variable		Total	* Poor Adherence (%)	Good Adhered (%)	p-value	Odds ratio	Lower 95% CI	Upper 95% CI
Gender	Females				0.685	1.422	0.260	7.771
Employed in last 12 months	*No	23	10 (43.4)	13 (56.5)				
	Yes	15	4 (26.6)	11 (73.3)	0.291	2.143	0.520	8.827
Total (N)		38	14 (36.8)	24 (63.1)				

*Reference category

Table 60 shows that gender controlling for employment in the last 12 months was not a statistically significant predictor of MA (OR = 1.422, 95% CI [0.260, 7.771], p = 0.685) and (OR = 2.143, 95% CI [0.520, 8.827], p = 0.291). The prevalence of respondents employed in the past 12 months with poor adherence was 26.6% (4 of 15), while that with good adherence was 73.3% (11 of 15). The prevalence for respondents not employed in the past 12 months with poor adherence was 43.4% (10 of 23), and with good adherence was 56.5% (13 of 23). I failed to reject the null hypothesis and did not demonstrate evidence to accept the alternate hypothesis ($p > 0.05$).

Table 61

Effect of Gender on Adherence Controlling for Occupation

					Binary Logistic Regression			
Variable		Total	* Poor Adherence (%)	Good Adhered (%)	p-value	Odds ratio	Lower 95% CI	Upper 95% CI
Gender	Females				0.355	4.000	0.211	75.659
Occupation	*Others	17	3 (17.6)	14 (82.3)				
	Self-employed	16	9 (56.2)	7 (43.7)	0.756	1.500	0.116	19.437
Total (N)		33	12 (36.3)	21 (63.6)				

*Reference category

Table 61 shows that the odds of females having good adherence than the males after controlling for occupation increases by a factor of 4.0; however, it was not statistically significant (OR = 4.000, 95% CI [0.211, 75.659], p = 0.355). Prevalence of self-employed respondents with good and poor MA were 43.7% (7 of 16) and 56.2% (9 of 16) respectively, while the prevalence of respondents in the other occupational group with good adherence was 82.3% (14 of 17) and 17.6% (3 of 17) for poor adherence. I failed to reject the null hypothesis and did not demonstrate evidence to accept the alternate hypothesis ($p > 0.05$).

Table 62

Effect of Gender on Adherence Controlling for Ethnic Group of Respondents

				Binary Logistic Regression			
	Total	Poor Adherence (%)	Good adherence (%)	p-value	Odds ratio	Lower 95% CI	Upper 95% CI
*Females				0.658	1.476	0.264	8.270
*Annang	12	5 (41.6)	7 (58.3)	0.758			
Ibibio	15	4 (26.6)	11 (73.3)	0.427	1.933	0.380	9.833
Oron	11	5 (45.4)	6 (54.5)	0.799	0.804	0.150	4.316
Others	1	0 (0.0)	1 (100.0)	1.000	1044790451.599	0.000	.
Total	39	14 (35.8)	25 (64.1)				

*Reference category

Table 62 shows that while controlling for the ethnic group of the respondents, gender was not a significant predictor of HIV MA (OR = 1.476, 95% CI [0.264, 8.270], p = 0.658). Respondents from Ibibio ethnic group were not statistically significantly more likely to have good ATM (OR = 1.933, 95% CI [0.380, 9.833], p = 0.427), while respondents from Oron were not statistically significantly less likely to have good adherence (OR = 0.804, 95% CI [0.150, 4.316], p = 0.799) than the Annangs. The Other ethnic group had no predictive effect on adherence (p = 1.000). The prevalence of respondents with poor AHIV medication were: 41.6% (5 of 12) for Annang, 26.6% (4 of 15) for Ibibio, 45.4% (5 of 11) for Oron, and 0.0% (0 of 1) for other ethnic groups. The prevalence of respondents with good AHIV medication were: 58.3% (7 of 12) for Annang, 73.3% (11 of 15) for Ibibio, 54.5% (6 of 11) for Oron, and 100.0% (1 of 1) for

other ethnic groups. I failed to reject the null hypothesis and did not demonstrate evidence to accept the alternate hypothesis ($p > 0.05$).

Table 63

Effect of Gender on Adherence Controlling for Knowledge

				Binary Logistic Regression			
Variable	Total	* Poor Adherence (%)	Good Adhered (%)	p-value	Odds ratio	Lower 95% CI	Upper 95% CI
Gender (Female)				0.623	1.530	0.280	8.354
*Lack knowledge	18	7 (38.8)	11 (61.1)				
Have good knowledge	21	7 (33.3)	14 (66.6)	0.662	1.348	0.354	5.139
Total (N)	39	14 (35.8)	25 (64.1)				

*Reference category

Table 63 shows that while controlling for knowledge, gender was not a significant predictor of HIV MA (OR = 1.530, 95% CI [0.280, 8.354], p = 0.623). Females who have good knowledge were 1.348 times more likely to have good HIV MA than those who lacked knowledge (OR = 1.348, 95% CI [0.354, 5.139], p = 0.662). The prevalence of respondents with poor adherence who lacked knowledge about HIV was 38.8% (7 of 18), while the prevalence of respondents who lacked knowledge about HIV but with good adherence was 61.1% (11 of 18). Also, the prevalence of respondents with good knowledge but poor adherence was 33.3% (7 of 21), and those with good knowledge and good adherence was 66.6% (14 of 21). I failed to reject the null hypothesis and did not demonstrate evidence to accept the alternate hypothesis ($p > 0.05$).

Table 64

Effect of Gender on Adherence Controlling for Attitude

				Binary Logistic Regression			
Variable	Total	* Poor Adherence (%)	Good Adherence (%)	p-value	Odds ratio	Lower 95% CI	Upper 95% CI
Gender (Female)				0.693	1.405	0.259	7.631
* Negative Attitude	10	5 (50.0)	5 (50.0)				
Positive attitude	29	9 (31.0)	20 (68.9)	0.291	2.209	0.507	9.620
Total (N)	39	14 (35.8)	25 (64.1)				

*Reference category

Table 64 shows that gender was not a significant predictor of HIV MA after controlling for attitude (OR = 1.405, 95% CI [0.259, 7.631], p = 0.693). Respondents with a positive AHIV were 1.405 times more likely to have good HIV MA than those with a negative attitude (OR = 2.209, 95% CI [0.507, 9.620], p = 0.291). The prevalence rates for respondents with poor adherence, but with a negative AHIV and good adherence with a negative AHIV were 50.0% (5 of 10) each. In comparison, the prevalence for respondents with poor adherence with a positive AHIV and good adherence with a positive AHIV were 31.0% (9 of 29) and 68.9% (20 of 29). I failed to reject the null hypothesis and did not demonstrate evidence to accept the alternate hypothesis ($p > 0.05$).

Summary

The results from Chapter Four from bivariate regression analyses justified the inclusion of covariates in the multivariable regression model. In some cases, the null hypotheses could not be rejected, as evidenced by data analysis derived from this study,

while in some other cases, the alternative hypotheses were accepted. The student t-test was used to compare the mean knowledge and mean attitude scores between male and female respondents in the study. Test for association (X^2) shows no significant association between gender and the following SDC – age, ethnicity, current school enrolment, educational level, education status, marital status, employment in the past 12 months, occupation, employment status, and location ($p > 0.05$).

There was no significant association between the respondents' knowledge of HIV and the respondent's gender, age, education level, marital status, location, ethnic group, respondents' employment in the last 12 months, educational status, and employment status. On the other hand, there was a significant association between the respondent's knowledge of HIV and the respondent's occupation.

For the attitude of respondents to HIV, there was no significant association between the respondents' AHIV and the respondent's gender, educational level, age, marital status, location, occupation, employment in the last 12 months, educational status, and employment status. On the other hand, there was a significant association between the respondent's AHIV and the respondent's ethnic group.

There was no significant association between HIVK and gender and no significant association between knowledge and occupation ($p > 0.05$). There was no significant association between the attitude of respondents to HIV and gender, but more Females had a negative attitude than males. Male respondents had higher mean knowledge and attitude scores (3.73 ±1.191 and 4.00 ±1.095) compared to the female respondents (3.14 ±1.296

and 3.76 ±1.64). However, no significant difference was observed in knowledge mean scores between the male and female respondents.

Findings from this study showed that the location of respondents, employment in the last 12 months, and occupation were statistically significant predictors of LC, while the attitude of respondents was a significant predictor of retention. In Chapter 5, these results will be interpreted and discussed in relation to other findings in the literature. Also, the study's limitations, the recommendations for further research where applicable, and implications for positive social change will be stated. Finally, the conclusions that capture the fundamental essence of this study will be made.

Chapter 5: Introduction

My research on the impact of gender on the drivers of the HIV epidemic in AKS along the HTC is purposed to close the gap in HIV care strategies in AKS and provide an evidence-based resource to HIV care providers and policymakers in AKS on ways to deliver individualized HIV preventive measures. There is a significant research vacuum in gender-based strategies that could improve LC, MA, and CR in AKS and SSG because early HIV researchers in AKS were focused on the sociocultural influences and other factors affecting HIV spread. The paucity of literature begs for studies on gender drivers of the HIV epidemic, as no study in the past examined how gender impacts the drivers of the HIV epidemic in AKS along the HTC continuum. Gender-based HIV epidemic, LC, MA, and CR, is an unexplored area of research and my research is intended to close this gap in the literature. My study tested the association between gender and LC, MA, and CR after controlling for SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV.

My study explored the comparative exponential impact of gender on the drivers of HIV infection in AKS SSN because of the high rate of new HIV cases in persons 15 years and older in AKS and the high prevalence of the infection among females. The design for my doctoral research was a quantitative cross-sectional design because it provided an approach to test for relationships necessary to gain knowledge factors that may account for good or poor linkage and adherence. At the same time, the quantitative research method can provide insight into the relationships among the variables in the study (Sana, 2019). Better public health practices and experiences for PLHIV may be

enhanced using quantitative analysis to answer research questions (Yusuf, 2019). According to Wang and Cheng (2020), a cross-sectional study facilitates data analysis from a population at a single point, is effective in measuring the prevalence of health outcomes, provides an approach for the researcher to test for relationships necessary to gain knowledge of determinants of health, and is an excellent tool for describing features of a population.

My study may fill the existing void in gender-based strategies needed to boost HIV care by creating awareness of the uneven impact of HIV drivers based on gender. As stated by TGF (2019), an epidemic-free goal is achievable when a more focused approach addresses the vulnerabilities that lead to HIV infection, including targeting high-risk HIV populations and those most affected by HIV.

The independent variable in my study was gender (Male or Female), and the dependent variables were LC, CR, and MA. At the same time, the covariates were SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV. My study explored these variables to determine if any association existed among them.

In this chapter of the study, I will present an interpretation of the research findings and describe how they confirm, disconfirm, or expand knowledge in the discipline by comparing them with what has been found in the peer-reviewed literature. I will also address the research limitations to generalizability, validity, and reliability. I will include recommendations for further research grounded in the strengths and limitations of the current study, the literature reviewed, and the potential impact for positive social change.

Interpretation of Findings

There were four times more female respondents than male respondents (F=51, M=11) in my study (Figure 17), which was similar to the characteristic of the respondents in studies by Ene et al. (2022) in Nigeria, Omosigho et al. (2023) in Ilorin, Kwara State, Nigeria, and both Naugle et al. (2019) and Desmon (2019) studies in Côte d'Ivoire, West Africa. My findings could be explained through the lenses of Joshi et al. (2021), that asserted that throughout Africa, there is a preponderance for lower participation rates in HIV studies by African men. In contrast with the reported gender distribution in my study, Akinwande et al. (2012) study of demographic predictors of HIV Serostatus among HIV counseling and testing clients in rural Nigeria, and Onu et al. (2016) study of the trend in gender and HIV testing service uptake in Northern Nigeria, had more males than female participants. However, more females in Onu et al.'s study tested positive for HIV during the study.

This gender difference in my study could be associated with the vulnerabilities created by unequal cultural, social, and economic status, as espoused by Avert (2020b), or the feminization of the epidemic (Adedokun et al., 2020; Awofala & Ogundele, 2018; Girum et al., 2018) especially in Nigeria and Sub-Saharan Africa. This finding could further be explained by the pattern of acquisition of HIV in both gender and the potential differences in treatment adherence and outcomes (Li et al., 2020). According to Li et al. (2020), the accessibility and availability of males to HIV testing services are limited compared to women because women can access HIV testing through antenatal care and other sexual reproductive health services unavailable to men. Gender disparities are

pervasive throughout the HIVCC in sub-Saharan Africa, with men testing, receiving treatment, and achieving VS at lower rates and experiencing mortality at higher rates than women (Desmon, 2019; Naugle et al., 2019). Stigma (Puskas & Hogg, 2014), fear of the disease, and the social and economic consequences of a positive diagnosis may be the primary barrier to this low number of men in their study (Desmon, 2019; Naugle et al., 2019). Being male was associated with increased odds of late diagnosis (MacCarthy 2016) since participants in my study were those already diagnosed with HIV. Together, these studies underscore the need to explore how gender dynamics may impact access to care.

Though the age category with more respondents and highest frequency in my study was 30-39 years (Table 5), in other studies conducted in Nigeria, 31-40 years (Omosigho et al., 2023) and 25-34 (Onovo et al., 2021) were categories with the highest number and frequency of HIV positive respondents. Generally, the age group 30 and 40 is considered the peak productive age (Institute of Medicine, 2012), and the consequence of HIV on this group may have far-reaching economic implications. HIV could impact the economy by shrinking the size of this working population, reducing total output, worsening the dependency ratio, and reducing the active labor force that could support vulnerable populations (Sunday et al., 2017). Additionally, the composition of the labor force in terms of skills, education, and experience may occur, leading to a decrease in labor productivity (Sunday et al., 2017).

My study showed no significant association between gender and SDC (location, age, education, marital status, employment, occupation, and ethnic group) of the

respondents. This result contrasted with a study in Nigeria carried out by Ibrahim et al. (2015), who found that SDC may cause differences in HIV prevalence in different geographic areas. According to Ibrahim et al., while illiteracy may be responsible for HIV infection in low-prevalence areas, employment and age <30 years may be responsible for HIV infection in high-prevalence areas.

Findings from this study showed no association between HIVK and gender, controlling for age, education, marital status, location, ethnic group, and employment. At the same time, there was a significant association between knowledge and occupation. In a different study in India, Hazarika (2010) reported significant gaps in HIVK among respondents, with women and rural residents experiencing lower levels of knowledge which became apparent when subjects were stratified by gender and place of residence. Nabunya et al. (2021) concluded that comprehensive HIVK is vital to reduce HIV transmission since a good understanding of one's medical condition could enhance compliance with treatment recommendations (which is associated with a successful MA). Their findings show that certain occupations may require special attention regarding HIV care. The knowledge levels of employees in some occupations could be improved by collaborating with the various informal and formal unions that cater to the needs of members of such occupations. These could effectively disseminate actionable information on the range of HIV/AIDS treatment services made available under the national program.

My study result showed no significant relationship between the attitude of respondents to HIV and gender controlling for education, age, marital status, location,

occupation, and employment, but a relationship existed between the attitude of respondents to HIV and ethnic groups. Hazarika (2010) reported significant differences in the attitude of individuals concerning HIV/AIDS based on gender from a study in India. The association based on ethnicity could be rooted in the cultural value system, which, according to Nabunya et al. (2021), could combine with other vulnerabilities in the participants to influence their AHIV. The findings of a relationship between the attitude of respondents to HIV and ethnic groups underscore the need for a well-coordinated communication strategy that is not limited to raising awareness in the community but also promotes behavioral and cultural changes through greater community involvement.

In my study, gender had no significant effect on linkage to HIV care ($p > 05$). There was no statistically significant relationship between gender and LC after controlling for SDC (location, age, education, marital status, employment, occupation, ethnic group), HIVK, and AHIV. This result differed from the results of Sohler et al.'s (2009) study of HIV-infected people in New York City, which found an association between gender and suboptimal HIV healthcare services utilization patterns. Boeke et al. (2018), where female participants tended to have lower linkage and retention in multivariable-adjusted models, Almirol et al. (2018), in which men were more likely to be linked than women, and women had lower odds of LTC compared with men., and Bbuye et al. (2022), who reported that single participants who were separated/divorced and female were less likely to be linked to HIV care.

My study suggested that respondents who resided in urban areas were 5 times more likely to be linked to HIV care than respondents who resided in rural areas. This

result corroborates Ochieng-Ooko et al.'s (2010) report that subjects with less than an hour of traveling time to a clinic and those who attended urban clinics were less likely to be lost to follow-up (Ochieng-Ooko et al., 2010) and also Anyaike et al. (2019), Suleiman and Momo (2016), and Uzochukwu et al. (2009). This result supported other published literature and demonstrated the positive effect of urbanization in improving healthcare access. Also, the odds of being linked to HIV care increased by a factor of 3 for respondents who were employed in the last 12 months, with occupation as a significant predictor of linkage to HIV care.

Gender had no significant effect on RHIVC controlling for SDC (location, age, educational level, educational status, marital status, occupation), attitude, and knowledge. Shah et al. (2022) showed that there exists a significant variation in the retention of patients in HIV care based on patient characteristics, with a robust association of many patient characteristics with RIC, including clinical, demographic, and other contextual variables that may be beneficial for improvements in HIV services. Working with HIV services at outpatient clinics in Kinshasa and Haut-Katanga, the Democratic Republic of Congo, Shah et al. (2022) found that the odds of retention were significantly higher for women than men. Also, Boeke et al. (2018) reported that female participants tended to have lower linkage and retention in multivariable-adjusted models.

Ethnic variation existed in my study, with respondents from Ibibio ethnic group not statistically significantly more likely to be retained in care. In contrast, respondents from Oron were 5.1 times significantly more likely to be retained in care than the respondents from Annang. The Other ethnic group had no predictive effect on adherence.

Also, respondents with a positive attitude were 4.097 significantly more likely to be retained in HIV care than those with a negative attitude. This finding was consistent with Ochieng-Ooko et al. (2010) and Ramadhani et al. (2007), which found that attitude (that could result in non-disclosure of an HIV+ status) was closely associated with poor MA.

Gender had no significant effect on AHIV medication controlling for the SDC (location, age, education, marital status, employment, occupation, ethnic group), attitude, and knowledge. Also, females were 3.414 times more likely to have good adherence than males, but this was not statistically significant. For females with poor adherence, the prevalence was 34.3% (11 of 32) and 42.8% (3 of 7) for males. Kahamba et al. (2017) in their study posited that gender inequity adversely affects adherence to ART in different ways for women and men living with HIV in Tanzania. Different social and behavioral factors could further fuel this inequity, according to Berg et al. (2004). A study of adherence rate among PLWHA receiving treatment in a Nigerian tertiary hospital by Anyaike et al. (2019) found that factors affecting adherence include lack of money for transportation to the hospital and avoiding being seen (see also Suleiman & Momo, 2016; Uzochukwu et al., 2009).

Nevertheless, Afe et al. (2018), in their study of Highly Active ART (HAART) among PLHIV in Southwest Nigeria, found that demographic factors such as gender, religion, finance, education, and marital status do not have any significant associations with adherence to HAART. Also, Adewuya et al. (2010) found a significant association between low adherence and marital status, educational level, perceived level of social support, and knowledge of the illness. Okoronkwo et al. (2013) found gender and age

disparity in HIV MA, with more females than males being non-adherent and the 40–49 age group as the most non adherent. Marital status and educational status had a significant influence on adherence, with married persons being more adherent to their medications compared to single or separated respondents with higher levels of adherence in respondents with tertiary education, but gender did not have a significant influence on their adherence to treatment (Chijioke-Nwauche & Akani, (2021). Though no association existed between the educational status of PLWHA and their ATMs in the Omole et al. (2012) study, occupational status was shown to affect adherence to ARV medications, and there was no significant difference between the occupation status of PLWHA and ATMs. A statistical significance relationship, however, existed between marital status and adherence to ARV medications (Omole et al. 2012).

In other studies, the determining factors for non-adherence were level of education, age, and income, as well as personal and/or interpersonal factors such as socio-familial support, perceived stigma, self-stigma, and factors related to disease and treatment (Sánchez Peña, 2021). de Fatima Bonolo et al. (2013) in a concurrent prospective study of patients initiating ART in Brazil, reported that Marital status (being married or in a stable union) increased the risk of non-adherence among female participants only. According to Berg et al. (2004), a consistent relationship between gender and adherence has not been found since many studies have failed to show a significant association between gender and antiretroviral adherence. Some of the studies that reported that no association between gender and adherence were limited either by

small numbers of women or by self-reporting, an inconsistency that could be confounded by unexamined social or behavioral factors, according to Berg et al. (2004).

Limitations of the Study

The limitations of this study include the fact that respondents were limited geographically to Akwa Ibom State, South-South Nigeria, and therefore may not be representative of the entire South-South region of Nigeria comprising 6 States and several ethnic groups or the entire country of Nigeria with its over 300 ethnic groups. The primary data from which this study was derived used questionnaires administered by trained field workers. According to Ross & Bibler Zaidi (2019), self-reported data that required the researcher to be present could threaten internal validity due to inaccuracies from social desirability bias. A self-administered questionnaire, thus, could reduce respondents' discomfort when answering sensitive questions or using unobtrusive data collection measures to reduce the Hawthorne effect. In addition, there could have been simultaneous effects of other factors unknown to the researcher, therefore, unexamined in this study, which could also cause the outcome. Furthermore, the small sample size may have impacted the precision of findings regarding research questions.

Recommendations

My study on the Gender-Based HIV Epidemic, CR, and MA supported some published literature in the public domain while highlighting new areas for future investigations. Researchers could further this field of study by examining how each mode of HIV transmission affects Linkage to HIV care, MA, and CR in both genders. This

research could be used to determine which mode of transmission positively or negatively impacts Linkage to HIV care, MA, and CR in both genders. In addition, further research should be done on the independent variable of age to determine which aspects of an increased age contribute to higher rates of MA in HIV-positive individuals. Similarly, primary data could be used to examine gender-based HIV epidemic, CR, and MA in South-South Nigeria using a larger sample size.

Implications for Positive Social Change

The positive social change goal of this research is that we could learn more about LC, CR, and MA to provide an evidence-based resource to HIV care providers and policymakers in AKS on the delivery of individualized HIV preventive measures. Such a delivery method could help reduce the burden of HIV, improve lives, and bring relieve to individuals, families, and communities. The result from this cross-sectional study could help close the gap in HIV care strategies in AKS, and in the literature from the paucity of published research work to date on the impact of gender on the drivers of the HIV epidemic in AKS. The results, contents, and findings from this study could serve as original contributions to the field of HIV research that could impact individuals at the various levels of the SEM and HTC.

Additionally, the information generated from data analysis may serve as a reference for policymakers during the assessment, implementation, and evaluation of projects that could improve LC, MA, and CR to contain the HIV surge in AKS. Results could be incorporated into budgetary plans to justify funds allocation, justify the rationale for developing individualized occupation-targeted programs that could improve HIVK,

and develop strategies to change attitudes about HIV among the various ethnic groups. The study's findings could guide those in the HIV field by identifying the varying needs of populations based on gender, which could be crucial in further examining how to help individuals achieve long-lasting MA to sustain the lives of PLHIV. The result indicates that employment and infrastructure, such as good roads, could indirectly impact HIV care positively. Findings from this gender-based HIV study could serve as a resource and available learning materials to those in the HIV field.

The knowledge from this study could guide the design of culturally sensitive tools for delivering HIV care that could appeal to beneficiaries. Gaining acceptance of PLHIV is a step towards helping them to achieve long-lasting VS, reduce the burden of HIV, and improve the lives and well-being of individuals, families, and communities most impacted by the HIV epidemic. The empirical data from this study could provide a good understanding of other behaviors and SDC in the study population that tends to perpetuate HIV spread in the age category 30 to 40 years. The data could guide the scale-up of HIV prevention and control strategies toward achieving epidemic control in AKS, Nigeria. Findings could broaden understanding, trigger a change of approach, and generate a receptive attitude towards PLHIV while also serving as a source of enlightenment among PLHIV on self-care, which may result in longer lives for those with HIV/AIDS. Implementing changes to address needs identified and disparity challenges could help PLHIV comply with care regimens. The study could promote positive behavioral change that may increase awareness of the benefits of HIVCC in AKS. At the family level, improving the health and well-being of PLHIV could mean reducing the

psychological burden, stress effects, overall mental health improvement, and the decreased financial struggle of caregivers and PLHIV.

Conclusion

There is not a single model or what MacCarthy et al. (2016) referred to as a one size fits all" model for the care of PLHIV since the provision of services may differ based on various factors. Measures that are informed by global guidelines are needed for the evaluation of the scope and factors associated with delays observed in each stage of the HIV cascade because doing so will help identify how practitioners can best deliver services, facilitate access, and sustain continued engagement in care (MacCarthy et al., 2016). The containment of the HIV surge in AKS will require an approach tailored to fit the population's needs through the deployment of innovations to communities needing urgent HIV care to address inequalities in access, perpetuating HIV in a harmful way (UNAIDS, 2022a).

A holistic patient-centered approach to providing care for PLHIV is needed to bind together economic, social, emotional, and physiological aspects since these can potentially improve Linkage to HIV care, RHIVC, and ARTA (Chinyandura et al., 2022). Lam and Presco (2015) asserted that increasing the effectiveness of adherence interventions may have a far more significant impact on the population's health than any improvement in specific medical treatment. By identifying factors that impact LC, CR, and MA positively or negatively, HIV researchers and public health practitioners can tailor programs, information, and outreach efforts more effectively to help those with

HIV/AIDS achieve higher adherence rates and live longer, complication-free lives in the process.

References

Achappa, B., Madi, D., Bhaskaran, U., Ramapuram, J. T., Rao, S., & Mahalingam, S. (2013). Adherence to antiretroviral therapy among people living with HIV. *North American Journal of Medical Sciences, 5*(3), 220–223. https://doi.org/10.4103/1947-2714.109196

Adebolawe, N. (2021, March 19). More women than men are HIV positive in Nigeria – Report. *Premium Times*. https://www.premiumtimesng.com/news/top-news/481792-more-women-than-men-are-hiv-positive-in-nigeria-report.html

Adedokun, O., Badru, T., Khamofu, H., Negedu-Momoh, O. R., Iwara, E., Agbakwuru, C., Atobatele, A., Merrigan, M., Ukpong, D., Nzelu, C., Ashefor, G., Pandey, S. R., & Torpey, K. (2020). Akwa Ibom AIDS indicator survey: Key findings and lessons learnt. *PloS ONE, 15*(6), e0234079. https://doi.org/10.1371/journal.pone.0234079

Adetoro, D., Khamofu, H., Badru, T., Markson, J., Adedokun, O., Sandah-Abubakar, N., Dafa, I., Chen, M., Chiegil, R., & Torpey, K. (2021). Correlates of uptake of HIV testing among children and young adolescents in Akwa-Ibom state, Nigeria: A secondary data analysis of the Akwa-Ibom aids indicator survey, 2017. *BMC Pediatrics, 21*(33). https://doi.org/10.1186/s12887-021-02495-5

Adewuya, A. O., Afolabi, M. O., Ola, B. A., Ogundele, O. A., Ajibare, A. O., Oladipo, B. F., & Fakande, I. (2010). The effect of psychological distress on medication adherence in persons with HIV infection in Nigeria. *Psychosomatics, 51*(1), 68–73. https://doi.org/10.1016/S0033-3182(10)70661-7

Afe, A. J., Motunrayo, O., & Ogungbade, G. O. (2018). Factors influencing adherence to HAART among patients living with HIV infection in southwest Nigeria: A cross-sectional analysis. *J HIV Retrovirus, 4*(1:1). https://www.primescholars.com/articles/factors-influencing-adherence-to-haart-among-patients-living-with-hiv-infection-in-southwest-nigeria-a-crosssectional-an-96556.html

African Union. (2013). *Declaration of the special summit of African Union on HIV/AIDS, Tuberculosis and Malaria: Abuja actions toward the elimination of HIV and AIDS, tuberculosis and malaria in Africa by 2030.* https://au.int/sites/default/files/documents/30729-doc-abuja_declaration_on_hiv_etc_special_summit_-_english.pdf

Agency for Toxic Substances and Disease Registry. (2015). Models and frameworks for the practice of community engagement. Principles of community engagement. (2nd ed.). *Clinical and Translational Science Awards Consortium Community Engagement Key Function Committee Task Force on the Principles of Community Engagement.* https://www.atsdr.cdc.gov/communityengagement/index.html

Ahonkhai, A. A, Aliyu, M. H., Audet, C. M., Bravo, M., Simmons, M., Claquin, G., Memiah, P., Fernando, A. N., Carlucci, J. G., Shepherd, B. E., Van Rompaey, S., Yu, Z., Gong, W., Vermund, S. H., & Wester, C. W. (2021). Poor retention and care-related sex disparities among youth living with HIV in rural Mozambique. *PLoS ONE, 16*(5), e0250921. https://doi.org/10.1371/journal.pone.0250921

Akai, I. U. (2021). *4th Quarter Scholar Practitioner Project: Synthesis and Submission of Scholar Practitioner Project* [Unpublished manuscript]. Walden University. https://class.walden.edu

Akinwande, O. A., Ele, P. U., Gebi, U. I., Igboelina, D. O., Dakum, P. S., & Alkan, M. L. (2012). Demographic predictors of HIV serostatus among HIV counseling and testing clients in rural Nigeria. Journal of the International Association of *Physicians in AIDS Care, 11*(6), 366–8. https://doi.org/10.1177/1545109712454193

Akwa Ibom State Government. (2022). *Government of Akwa Ibom State*. https://akwaibomstate.gov.ng/

Akwa Ibom State Ministry of Economic Development. (2013). *Statistical yearbook publication - National Bureau of statistics.* https://www.nigerianstat.gov.ng/pdfuploads/Statistical%20Year%20Book%20Publication.pdf

Akwa Ibom State Ministry of Health (AKSMOH), Akwa Ibom State Action Committee on AIDS (AKSACA), Federal Ministry of Health (FMOH), National Agency for the Control of AIDS (NACA), and FHI 360. (2022). *Akwa Ibom AIDS indicator survey 2016–2017*. https://www.fhi360.org/resource/akwa-ibom-state-aids-indicator-survey

Akwa Ibom State Ministry of Health, FHI 360 and UNAIDS. (2013). *Akwa-Ibom State: Operational plan for elimination of mother-to-child transmission of HIV: 2013-2015.*

https://www.fhi360.org/sites/default/files/media/documents/Akwa%20State%20Op%20Plan.pdf

All Answers Ltd. (2018). *Impact of HIV on society.* https://nursinganswers.net/essays/hiv-aids-effects-on-community-health-and-social-care-essay.php?vref=1a

Almirol, E. A., McNulty, M. C., Schmitt, J., Eavou, R., Taylor, M., Tobin, A., Ramirez, K., Glick, N., Stamos, M., Schuette, S., Ridgway, J. P., & Pitrak, D. (2018). Gender differences in HIV testing, diagnosis, and linkage to care in healthcare settings: Identifying African American women with HIV in Chicago. *AIDS Patient-Care and STDs, 32*(10), 399–407. https://doi.org/10.1089/apc.2018.0066

American Public Health Association. (2021). *What is public health?* https://www.apha.org/what-is-public-health#:~:text=Public%20health%20promotes%20and%20protects,injured%20in%20the%20first%20place.

Amin, A. (2015). Addressing gender inequalities to improve the sexual and reproductive health and wellbeing of women living with HIV. *Journal of the International AIDS Society, 18*(Suppl 5), 20302. https://doi.org/10.7448/IAS.18.6.20302

Anyaike, C., Atoyebi, O. A., Musa, O. I., Bolarinwa, O. A., Durowade, K. A., Adeniyi Ogundiran, & Babatunde, O. A. (2019). Adherence to combined antiretroviral therapy (cART) among people living with HIV/AIDS in a tertiary hospital in Ilorin, Nigeria. *The Pan African Medical Journal, 32*(10). https://doi.org/10.11604/pamj.2019.32.10.7508

Aronica, K., Crawford, E., Licherdell, E., & Onoh, J. (n.d.). The social ecological model. In J. S. Kruger (Ed.), *Models and mechanisms of public health* (Chapter 3). Lumen Candela. https://courses.lumenlearning.com/suny-buffalo-environmentalhealth/

Aschengrau, A., & Seage, G. R., III. (2014). *Essentials of epidemiology in public health* (3rd ed.). Burlington, MA: Jones & Bartlett

Avert. (2021a). *The HIV treatment cascade*. https://www.avert.org/professionals/hiv-programming/treatment/cascade#:~:text=The%20HIV%20treatment%20cascade%20is,are%20engaged%20at%20each%20stage.

Avert. (2021b). *Global HIV targets*. https://www.avert.org/global-hiv-targets

Avert. (2020a). *HIV and AIDS in Nigeria*. https://www.avert.org/professionals/hiv-around-world/sub-saharan-africa/nigeria

Avert. (2020b) *Women and girls, HIV and AIDS*. https://www.avert.org/professionals/hiv-social-issues/key-affected-populations/women

Awofala, A. A., & Ogundele, O. E. (2018). HIV epidemiology in Nigeria. *Saudi Journal of Biological Sciences, 25*(4), 697–703. https://doi.org/10.1016/j.sjbs.2016.03.006

Babalola, S., Van Lith, L. M., Mallalieu, E. C., Packman, Z. R., Myers, E., Ahanda, K. S., Harris, E., Gurman, T., & Figueroa, M. E. (2017). A framework for health communication across the HIV treatment continuum. *Journal of Acquired Immune Deficiency Syndrome (1999), 74*(Suppl 1), S5–S14. https://doi.org/10.1097/QAI.0000000000001206

Badru, T., Mwaisaka, J., Khamofu, H. Agbakwuru, C., Adedokun, O., Pandey, S, R., Essiet, P., James, E., Chen-carrington, A., Mastro, T. D., Aliyu, S. H., & Torpey, K. (2020). HIV comprehensive knowledge and prevalence among young adolescents in Nigeria: Evidence from Akwa Ibom AIDS indicator survey, 2017. *BMC Public Health, 45*(2020). https://doi.org/10.1186/s12889-019-7890-y

Banks, D.E., Hensel, D. J. & Zapolski, T.C.B. (2020). Integrating individual and contextual factors to explain disparities in HIV/STI among heterosexual African American youth: A contemporary literature review and social ecological model. *Arch Sex Behav*, (49), 1939–1964. https://doi.org/10.1007/s10508-019-01609-6

Baral, S., Logie, C.H., Grosso, A., Wirtz, A. L., & Beyrer, C. (2013). Modified social ecological model: a tool to guide the assessment of the risks and risk contexts of HIV epidemics. *BMC Public Health, 13*(482). https://doi.org/10.1186/1471-2458-13-482

Basavaraj, K. H, Navya, M. A, & Rashmi, R. (2010). Quality of life in HIV/AIDS. *Indian Journal of Sexually Transmitted Diseases AIDS, 31*(2), 75-80. https://doi.org/10.4103/0253-7184.74971

Bbuye, M., Muttamba, W., Nassaka, L., Nakyomu, D., Taasi, G., Kiguli, S., Mayega, R. W., & Mukose, A. D. (2022). Factors associated with linkage to HIV care among oral self-tested HIV positive adults in Uganda. *HIV AIDS (Auckl).* (14), 61-72. https://doi.org/10.2147/HIV.S346951

Bedert, M., Davidovich, U., de Bree, G., van Bilsen, W., van Sighem, A., Zuilhof, W., Brinkman, K., van der Valk M., & de Wit, J. (2021). Understanding reasons for HIV late diagnosis: A qualitative study among HIV-Positive individuals in Amsterdam, the Netherlands. *AIDS Behav.* (25), 2898–2906. https://doi.org/10.1007/s10461-021-03239-3

Berger, M. B., Sullivan, K. A., Parnell, H. E., Keller, J., Pollard, A., Cox, M. E., Jacquelyn M. Clymore, J. M., & Quinlivan, E. B. (2016). Barriers and facilitators of reengaging HIV clients in care: A Case Study of North Carolina. *Journal of the International Association of Providers of AIDS Care 2016, 15*(6), 486–493. https://doi.org/10.1177/2325957415616491

Berg, K. M., Demas, P. A., Howard, A. A., Schoenbaum, E. E., Gourevitch, M. N., & Arnsten, J. H. (2004). Gender differences in factors associated with adherence to antiretroviral therapy. *J Gen Intern Medicine, 19*(11), 1111-7. https://doi.org/10.1111/j.1525-1497.2004.30445.x.

Boeke, C. E., Nabitaka, V., Rowan, A., Guerra, K., Kabbale, A., Asire, B., Magongo, E., Nawaggi, P., Mulema, V., Mirembe, B., Bigira, V., Musoke A., & Katureebe, C. (2018). Assessing linkage to and retention in care among HIV patients in Uganda and identifying opportunities for health systems strengthening: a descriptive study. *BMC Infect Disease, 18* (138). https://doi.org/10.1186/s12879-018-3042-8

Bujang M. A. (2021). A Step-by-step process on sample size determination for medical research. *The Malaysian Journal of Medical Sciences: MJMS, 28*(2), 15–27. https://doi.org/10.21315/mjms2021.28.2.2

Cadima, E. X., Caramelo, A. M., Afonso-Dias, M., Conte de Barros, P., Tandstad, M. O., & de Leiva-Moreno, J. I. (2005). *Sampling methods applied to fisheries science: A manual.* [F.A.O. Fisheries Technical Paper]. No. 434. Rome, F.A.O. https://www.fao.org/3/a0198e/A0198E02.htm

Campbell, D.T. & Stanley, J.C. (1963). *Experimental and quasi-experimental designs for research.* Boston: Houghton Mifflin.

Carlson, M. D., & Morrison, R. S. (2009). Study design, precision, and validity in observational studies. *Journal of Palliative Medicine, 12*(1), 77–82. https://doi.org/10.1089/jpm.2008.9690

Centers for Disease Control and Prevention. (n.d.). *What are CD4 cells?* https://www.cdc.gov/hiv/pdf/effective-interventions/treat/steps-to-care/my-stc/cdc-hiv-stc-what-are-cd4-cells.pdf

Center for Family and Demographic Research. (2006). *Annotated output – SPSS: Logistic regression.* http://www.bgsu.edu/organizations/cfdr/index.html

Chandwani, H., & Gopal, R. (2010). Social change communication: Need of the hour of prevention of HIV/AIDS. *Journal of Clinical Medicine Research, 2*(1), 23–26. https://doi.org/10.4021/jocmr2009.12.1285

Chen, Y., Chen, K., & Kalichman, S. C. (2017). Barriers to HIV medication adherence as a function of regimen simplification. *Annals of Behavioral Medicine: A Publication of the Society of Behavioral Medicine, 51*(1), 67–78. https://doi.org/10.1007/s12160-016-9827-3

Chijioke-Nwauche, I. N., & Akani, Y. (2021). Influencing factors of adherence to antiretroviral drugs among people living with HIV in South-South Nigeria. *Saudi Journal of Medical and Pharmaceutical Sciences.* https://doi.org/10.36348/sjmps.2021.v07i02.011

Chinyandura, C., Jiyane, A., Tsalong, X., Struthers, H. E., McIntyre, J. A., & Rees, K. (2022). Supporting retention in HIV care through a holistic, patient-centred approach: A qualitative evaluation. *BMC Psychology*, *10*(1), 1–9. https://doi.org/10.1186/s40359-022-00722-x

City Population. (2017). *Akwa Ibom State in Nigeria.* https://citypopulation.de/php/nigeria-admin.php?adm1id=NGA003

Cohen, M. S., Chen, Y. Q., McCauley, M., Gamble, T., Hosseinipour, M.C., Kumarasamy, N., Hakim, J. G., Kumwenda, J., Grinsztejn, B., Pilotto, J. H. S., Godbole, S. V., Mehendale, S., Chariyalertsak, S., Santos, B. R., Mayer, K. H., Hoffman, I. F., Eshleman, S. H., Piwowar-Manning, E., Wang, L., …Makhema, J. (2011). Prevention of HIV-1 infection with early antiretroviral therapy. *N Engl J Med.* (365), 493-505. https://doi.org/10.1056/NEJMoa1105243

Columbia University Mailman School of Public Health. (2021). *Epidemic, endemic, pandemic: What are the differences?* https://www.publichealth.columbia.edu/public-health-now/news/epidemic-endemic-pandemic-what-are-differences

Cook, T. D. & Campbell, D. T. (1979). *Quasi-experimentation: design and analysis issues for field settings.* Boston: Houghton Mifflin.

Cooper, V., Clatworthy, J., Harding, R., Whetham, J., & Emerge Consortium. (2017). Measuring quality of life among people living with HIV: a systematic review of reviews. *Health and Quality of Life Outcomes, 15*(1), 220. https://doi.org/10.1186/s12955-017-0778-6

Coreil, J. (Ed.). (2010). Social and behavioral foundations of public health (2nd ed.). Thousand Oaks, CA: Sage.

Croxford, S., Yin, Z., Burns, F., Copas, A., Town, K., Desai, S., Skingsley, A., & Delpech, V. (2018). OptTEST project. Linkage to HIV care following diagnosis in the WHO European Region: A systematic review and meta-analysis, 2006-2017. *PLoS ONE, 13*(2), e0192403. https://doi.org/10.1371/journal.pone.0192403.

Curtin University Library. (2022). *Introduction to statistics*. https://libguides.library.curtin.edu.au/uniskills/numeracy-skills/statistics/descriptive

Dahiru, T., Aliyu, A., & Kene, T. (2006). Statistics in medical research: Misuse of sampling and sample size determination. *Annals of African Medicine, 5*(3), 158 – 161. https://link.gale.com/apps/doc/A365633102/AONE?u=googlescholar&sid=bookmark-AONE&xid=1214b834

Data for Information (2020). *Mind the Gap: Leveraging the national HIV/AIDS indicator and impact survey (NAIIS) data to identify service delivery gaps in Akwa Ibom State*. http://pdf.usaid.gov/pdf_docs/PA00XBDD.pdf

Dauda, R. S. (2019). HIV/AIDS and economic growth: Evidence from West Africa. *Health Planning and Management, 34*(1), 324-337. https://doi-org.ezp.waldenulibrary.org/10.1002/hpm.2633

de Fatima Bonolo, P., Ceccato, M. das G. B., Rocha, G. M., de Assis Acúrcio, F., Campos, L. N., & Guimarães, M. D. C. (2013). Gender differences in non-adherence among Brazilian patients initiating antiretroviral therapy. *Clinics*, *68*(5), 612–620. https://doi.org/10.6061/clinics/2013(05)06

DeLay, P. R., Benzaken, A., Karim, Q. A., Aliyu, S., Amole, C., Ayala, G., Chalkidou, K., Chang, J., Clayton, M., Couto, A., Dieffenbach, C., Dybul, M., El Sadr, W., Gorgens, M., Low-Beer, D., Mesbah, S., Saveedra, J., Sirinirund, P., Stover, J., …Syarif, O. (2021) Ending AIDS as a public health threat by 2030: Time to reset targets for 2025. *PLoS Med, 18*(6), e1003649. https://doi.org/10.1371/journal.pmed.1003649

Deputy Director for Public Health Science and Surveillance, Center for Surveillance, Epidemiology, and Laboratory Services, Division of Scientific Education and Professional Development. (2012). *Lesson 1: Introduction to epidemiology: Section 11: Epidemic disease occurrence.* https://www.cdc.gov/csels/dsepd/ss1978/lesson1/section11.html

Desmon, S. (2019). *Study: Fear keeps men from HIV testing.* Johns Hopkins Center for Communication Programs. https://ccp.jhu.edu/2019/10/28/study-fear-keeps-men-from-hiv-testing/

Division of HIV Prevention, National Center for HIV, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention. (2022). *HIV and women: Knowledge of status*. https://www.cdc.gov/hiv/group/gender/women/status-knowledge.html#:~:text=Knowledge%20of%20status%20is%20one,on%20sex%20assigned%20at%20birth.

Division of HIV Prevention, National Center for HIV, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention. (2021). *Treatment, care, and prevention for people with HIV*. https://www.cdc.gov/hiv/clinicians/treatment/index.html

Dyson, Y. D., Mobley, Y., Harris, G., & Randolph, S. D. (2018). Using the Social-Ecological Model of HIV prevention to explore HIV testing behaviors of young black college women. *Journal of the Association of Nurses in AIDS Care, 29* (1), 53-59. https://doi.org/10.1016/j.jana.2017.11.003

Ekeji, N., & Ekeji, N. I. (2021). Relationship between Treatment Comorbidities and Viral Suppression of HIV Infections in Johannesburg. *Walden Faculty and Staff Publications*. https://academicguides.waldenu.edu/library

Ene, U., Onyenuobi, C., Efuntoye, T., Meribe, C., Ogbanufe, O., Bassey, O., Fagbamigbe, O. J., Fagbemi, A., Bamidele, M., Audu, I., Adegoke, D., Tapdiyel, J., Emeh, A., Obanubi, C., Oke, O., Pals, S., Boyd, A. T., Zeh, C., Ellenberger, D., … Dirlikov, E. (2022). Low-level viraemia among people living with HIV in Nigeria: A retrospective longitudinal cohort study. *The Lancet Global Health, 10*(12), e1815–e1824. https://doi.org/10.1016/S2214-109X(22)00413-2

Enete, A. A & Okon, U. E. (2010). Economics of waterleaf (Talinumtriangulare) production in Akwa Ibom State, Nigeria. *The Journal of Field Actions, Field Actions Science Report,* 4. https://journals.openedition.org/factsreports/438#:~:text=Nutritionally%2C%20waterleaf%20has%20been%20proven,Aduku%20and%20Olukosi%2C%201990).

Family Health International. (2019). *Implementing the surge HIV response in Akwa Ibom: An accelerated HIV epidemic control drive* [Technical brief-2019]. https://www.fhi360.org/sites/default/files/media/documents/resource-nigeria-hiv-surge-hiv-response.pdf

Federal Republic of Nigeria. (2017). *National HIV and AIDS strategic plan (NSP) 2017-2021*. https://naca.gov.ng/wp-content/uploads/2018/05/National-HIV-and-AIDS-Strategic-Plan-FINAL1.pdf

Ferrer, H. B., Trotter, C. L., Hickman, M., & Audrey, S. (2015). Barriers and facilitators to uptake of the school-based HPV vaccination programme in an ethnically diverse group of young women. *Journal of Public Health, (Oxf), 38*(3), 569-577. https://doi.org/10.1093/pubmed/fdv073.

Fong, O. W. (n.d.). *III. HIV therapies: 13. Adherence to HIV treatment.* https://www.aids.gov.hk/pdf/g190htm/13.htm

Fox, N., Hunn. A., & Mathers, N. (2009). *Sampling and sample size calculation*. https://www.bdct.nhs.uk/wp-content/uploads/2019/04/Sampling-and-Sample-Size-Calculation.pdf

Galway, L., Bell, N., S.A.E., A.S., Hagopian, A., Burnham, G., Flaxman, A., Weiss, W. M., Rajaratnam, J. & Takaro, T. K. (2012). A two-stage cluster sampling method using gridded population data, a G.I.S., and Google Earth imagery in a population-based mortality survey in Iraq. *International Journal of Health Geography, 11*(12). https://doi.org/10.1186/1476-072X-11-12

Gast, A., & Mathes, T. (2019). Medication adherence influencing factors, an (updated) overview of systematic reviews. *Syst Rev, 8*(112). https://doi.org/10.1186/s13643-019-1014-8

Girum, T., Wasie, A., Lentiro, K., Muktar, E., Shumbej, T., Difer, M., Shegaze, M., & Worku, A. (2018). Gender disparity in epidemiological trend of HIV/AIDS infection and treatment in Ethiopia. *Archives of Public Health, 76*(1), 1–10. https://doi.org/10.1186/s13690-018-0299-8

Gombachika, B. C., Fjeld, H., Chirwa, E., Sundby, J., Malata, A., & Maluwa, A. (2012). A social ecological approach to exploring barriers to accessing sexual and reproductive health services among couples living with HIV in Southern Malawi. *International Scholarly Research Notices, 825459*. https://doi.org/10.5402/2012/825459

Gourlay, A., Birdthistle, I., Mburu, G., Iorpenda, K., & Wringe, A. (2013). Barriers and facilitating factors to the uptake of antiretroviral drugs for prevention of mother-to-child transmission of HIV in sub-Saharan Africa: A systematic review. *Journal of the International AIDS Society, 16*(1), 18588. https://doi.org/10.7448/IAS.16.1.18588.

Hazarika, I. (2010). Knowledge, attitude, beliefs and practices in HIV/AIDS in India: Identifying the gender and rural–urban differences. Asian Pacific Journal of Tropical Medicine, 3(10), 821–827. https://doi.org/10.1016/S1995-7645(10)60198-8

Hickey, M. D., Ouma, G. B., Mattah, B., Pederson, B., DesLauriers, N. R., Mohamed, P., Obanda, J., Odhiambo, A., Njoroge, B., Otieno, L., Zoughbie, D. E., Ding, E. L., Fiorella, K. J., Bukusi, E. A., Cohen, C. R., Geng, E. H., & Salmen, C. R. (2021). The Kanyakla study: Randomized controlled trial of a microclinic social network intervention for promoting engagement and retention in HIV care in rural Western Kenya. *PLoS ONE*, *16*(9), 1–14. https://doi.org/10.1371/journal.pone.0255945

HIV.gov (2021a). *What is ending the HIV epidemic in the U.S?* https://www.hiv.gov/federal-response/ending-the-hiv-epidemic/overview

HIV.gov. (2021b). *Global HIV/AIDS overview*. https://www.hiv.gov/federal-response/pepfar-global-aids/global-hiv-aids-overview

HIV.gov. (2021c). *What is the HIV care continuum*? https://www.hiv.gov/federal-response/policies-issues/hiv-aids-care-continuum

HIV.gov. (n.d.). *HIV/AIDS glossary*. https://clinicalinfo.hiv.gov/en/glossary/adherence

HIVinfo@NIH.gov. (2021). *HIV testing*. https://hivinfo.nih.gov/understanding-hiv/fact-sheets/hiv-testing

IBM. (2020). *IBM Support: Odds ratio exp(B) is 1 but variable is significant.* https://www.ibm.com/support/pages/odds-ratio-expb-1-variable-significant

Ibrahim, S. A., Sabitu, K., Abubakar, A., Poggensee, G., Ibrahim, S., Riyad, M., Bashorun, A., Sudawa, A. U., Ibrahim, B. S., Mohammed, H., Ezeudu, C., Abubakar, A. A., Nsubuga, P., & Nguku, P. (2019). Demographic factors associated with HIV infection between low and high prevalence areas in Nigeria, 2015. *The Pan African Medical Journal, 32*(Suppl 1), 11. https://doi.org/10.11604/pamj.supp.2019.32.1.13330

Institute for Work and Health. (2015). *Cross-sectional vs. Longitudinal studies*. https://www.iwh.on.ca/what-researchers-mean-by/cross-sectional-vs-longitudinal-studies

Institute of Medicine (US). Committee on the Long-Run Macroeconomic Effects of the Aging U.S. Population. (2012). *Aging and the macroeconomy: Long-term implications of an older population. Aging, Productivity, and Innovation.* Washington, DC: National Academies Press (US); https://www.ncbi.nlm.nih.gov/books/NBK148825/

Isaac, E., Ajani, A., Difa, A., Aremu, J., Oluwaseun, O., & Hassan, M. (2021). Viral suppression in adult Nigerians in a regional antiretroviral therapy programme: A cross sectional descriptive study. *World Journal of AIDS,* (11), 1-14.

Izudi, J., Mugenyi, J., Mugabekazi, M., Muwanika, B., Tumukunde Spector, V., Katawera, A., & Kekitiinwa, A. (2018). Retention of HIV-positive adolescents in care: A quality improvement intervention in Mid-Western Uganda. *Biomed Res International, 2018,* 1–8. https://doi.org/10.1155/2018/1524016 https://doi.org/10.4236/wja.2021.111001.

Jahun, I., Mukhtar, M., Yakubu, A., Zakirai, M., Moyosola, B., Aliyu, A., Habib, A., & Aliyu, G. (2021). Assessment of the affordability of out-of-pocket payments among some selected people living with HIV in Kano, Nigeria. *World Journal of AIDS*, (11), 71-83. https://doi.org/10.4236/wja.2021.112007.

Jones, S. R., Carley, S., & Harrison, M. (2003). An introduction to power and sample size estimation. *Emerg Med J, 20*(5), 453-8. https://doi.org/10.1136/emj.20.5.453. Erratum in: Emerg Med J. 2004 Jan; 21(1):126.

Joshi, K., Lessler J., Olawore, O., Loevinsohn, G., Bushey, S., Tobian, A. A. R., & Grabowski, M. K. (2021). Declining HIV incidence in sub-Saharan Africa: A systematic review and meta-analysis of empiric data. *J Int AIDS Soc, 10*(e25818). https://doi.org/10.1002/jia2.25818.

Jumento, T. (2017). Nutrition Services, Viral Suppression, CD4, and Retention in Ryan White Program Participants. *Walden Dissertations and Doctoral Studies*. https://academicguides.waldenu.edu/library

Kadam, P., & Bhalerao, S. (2010). Sample size calculation. International Journal of Ayurveda Research, 1(1), 55–57. https://doi.org/10.4103/0974-7788.59946

Kahamba, J. S., Massawe, F. A., Nombo, C. I., & Jeckoniah, J. N. (2017). *How gender affects adherence to antiretroviral therapy in Tanzania* [MEASURE evaluation–Tanzania working paper]. https://www.measureevaluation.org/resources/publications/wp-17-196/at_download/document

Kaiser Family Foundation. (2021). *The global HIV/AIDS epidemic.* https://www.kff.org/global-health-policy/fact-sheet/the-global-hivaids-epidemic/

Kaliyadan, F., & Kulkarni, V. (2019). Types of variables, descriptive statistics, and sample size. *Indian Dermatology Online Journal, 10*(1), 82–86. https://doi.org/10.4103/idoj.IDOJ_468_18

Kaufman, M. R., Cornish, F., Zimmerman, R., & Johnson, B. (2014). Health behavior change models for HIV prevention and AIDS care. *AIDS Journal of Acquired Immune Deficiency Syndromes,* (66), S250-S258. https://doi.org/10.1097/QAI.0000000000000236

Kay, E. S., Batey, D. S., & Mugavero, M. J. (2016). The HIV treatment cascade and care continuum: Updates, goals, and recommendations for the future. *AIDS Research and Therapy, 13*(35). https://doi.org/10.1186/s12981-016-0120-0

Kempf, M. C., McLeod, J., & Boehme, A. K. (2010). A qualitative study of the barriers and facilitators to retention-in-care among HIV-positive women in the rural southeastern United States: Implications for targeted interventions. *AIDS Patient Care STDS, 24*(8), 515–520. https://doi.org/10.1089/apc.2010.0065

Kilanowski, J. F. (2017). The breadth of the socio-ecological model. *Journal of Agromedicine, 22*(4), 295-297. https://doi.org/10.1080/1059924X.2017.1358971

Kim, J., Lee, E., Park, B, J., Bang, J. H., & Lee, J. Y. (2018). Adherence to antiretroviral therapy and factors affecting low medication adherence among incident HIV-infected individuals during 2009-2016: A nationwide study. *Sci Rep. 8*(1), 3133. https://doi.org/10.1038/s41598-018-21081-x.

Koduah, O. K., Adu-Gyamfi, R., & Ahmed, Z. (2019). Strategies to improve linkage to HIV care in urban areas of Sub-Saharan Africa: A systematic review. *HIV AIDS (Auckl),* 11. 321-332. https://doi.org/10.2147/HIV.S216093

Kose, S., Mandiracioglu, A., Mermut, G., Kaptan, F., & Ozbel, Y. (2012). The social and health problems of people living with HIV/AIDS in Izmir, Turkey. *Eurasian Journal of Medicine, 44*(1), 32–39. https://doi.org/10.5152/eajm.2012.07.

Laerd Dissertation. (2012a). *Internal validity*. https://dissertation.laerd.com/internal-validity.php#

Laerd Dissertation. (2012b). *External validity*. https://dissertation.laerd.com/external-validity-p3.php

Laerd Statistics. (2023). *Binomial logistic regression using SPSS statistics*. https://statistics.laerd.com/spss-tutorials/binomial-logistic-regression-using-spss-statistics.php

Lam, W. Y & Fresco, P. (2015). Medication adherence measures: An overview. *BioMed Research International*. https://doi.org/10.1155/2015/217047

Laureate Education (Producer). (2016). *Bivariate categorical tests* [Video file]. Baltimore, MD: Author.

Li, L., Yuan, T., Wang, J., Fitzpatrick, T., Li, Q., Li, P., Tang, X., Xu, G., Chen, D., Liang, B., Cai, W., & Zou, H. (2020). Sex differences in HIV treatment outcomes and adherence by exposure groups among adults in Guangdong, China: A retrospective observational cohort study. *EClinical Medicine*, 22. https://doi.org/10.1016/j.eclinm.2020.100351

Lopez-Varela, E., Augusto, O., Fuente-Soro, L., Sacoor, C., Nhacolo, A., Casavant, I., Karajeanes, E., Vaz, P., & Naniche, D. (2021). Quantifying the gender gap in the HIV care cascade in southern Mozambique: We are missing the men. *PLoS ONE, 16*(2), e0245461. https://doi.org/10.1371/journal.pone.0245461

MacCarthy, S., Hoffmann, M., Nunn, A., Silva, L. A. V., & Dourado, I. (2016). Barriers to HIV testing, linkage to care, and treatment adherence: A cross-sectional study from a large urban center of Brazil. *Rev Panam Salud Publica, 40*(6), 418–26. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9897025/

MacKinnon, D. P. (2011). Integrating mediators and moderators in research design. *Res Soc Work Pract. 21*(6), 675–681. https://doi.org/doi:10.1177/1049731511414148

Magnus, M., Herwehe, J., & Murtaza-Rossini, M. (2013). Linking and retaining HIV patients in care: The importance of provider attitudes and behaviors. *AIDS Patient Care STDS, 27*(5), 297–303. https://doi.org/10.1089/apc.2012.0423

Management Sciences for Health. (2022). *Strengthening the Akwa Ibom health system for improved HIV response* [Technical brief]. https://msh.org/resources/technical-brief-strengthening-the-akwa-ibom-health-system-for-improved-hiv-response/

MedlinePlus. (2021). *HIV screening test*. https://medlineplus.gov/lab-tests/hiv-screening-test/

Mbonu, N.C., Van den Borne, B. & De Vries, N.K. (2010). Gender-related power differences, beliefs and reactions towards people living with HIV/AIDS: an urban study in Nigeria. *BMC Public Health, 10*(334). https://doi.org/10.1186/1471-2458-10-334

Mogoba, P., Lesosky, M., Zerbe, A., Falcao, J., Mellins, C. A., Desmond, D., Arnaldo, C., Kapogiannis, B., Myer, L., & Elaine J. Abrams. (2021). The CombinADO study to assess the impact of a combination intervention strategy on viral suppression, antiretroviral therapy adherence, and retention in HIV care among adolescents and young people living with HIV: Protocol for a cluster-randomized controlled trial. *Trials, 22*(1), 1–13. https://doi.org/10.1186/s13063-021-05943-w

Moitra, E., Chan, P. A., Molina, P. E., Ernst, F., Ferguson, T. F., Mimiaga, M. J., Herman, D. S., & Stein, M. D. (2021). HIV Engage—A randomized controlled efficacy trial of an acceptance-based behavioral therapy intervention to improve retention in care for HIV treatment naïve patients: Study protocol. *Contemporary Clinical Trials*, 108. https://doi.org/10.1016/j.cct.2021.106514

Mosugu, T. (2021) An evidence-based management approach to HIV/AIDS in Nigeria. *World Journal of AIDS*, *11*, 120-142. https://doi.org/10.4236/wja.2021.113010.

Mugavero, M. J., Norton, W. E., & Saag, M. S. (2011). Health care system and policy factors influencing engagement in HIV medical care: Piecing together the fragments of a fractured health care delivery system. *Clin Infect Dis. 52(suppl 2),* S238–S246. https://doi.org/10.1093/cid/ciq048

Mukumbang, F. C., Mwale, J. C., & van Wyk, B. (2017). Conceptualising the factors affecting retention in care of patients on antiretroviral treatment in Kabwe District, Zambia, using the ecological framework. *AIDS Research & Treatment*, 1–11. https://doi.org/10.1155/2017/7356362

Murphy, W. (2018). *Socio ecological model CDC obesity rates: Models and frameworks for the practice of community engagement*. https://medicineonthemove.org/obesity/socio-ecological-model-cdc-obesity-rates/

Muwanguzi, M., Lugobe, H. M., Ssemwanga, E., Lule, A. P., Atwiine, E., Kirabira, V., Stella, A. K., Ashaba, S., & Rukundo, G. Z. (2021). Retention in HIV care and associated factors among youths aged 15–24 years in rural southwestern Uganda. *BMC Public Health*, *21*(1), 1–8. https://doi.org/10.1186/s12889-021-11547-5

Nabunya, P., Byansi, W., Muwanga, J., Damulira, C., Brathwaite, R., Namuwonge, F., Bahar, O. S., & Ssewamala, F. M. (2021). Gender, HIV knowledge and prevention attitudes among adolescents living with HIV participating in an economic empowerment intervention in Uganda. *AIDS Care, 33*(7), 888–896. https://doi.org/10.1080/09540121.2020.1844860

Nalubega, S., Kyenkya, J., Bagaya, I., Nabukenya, S., Ssewankambo, N., Nakanjako, D., & Kiragga, A. N. (2021). COVID-19 may exacerbate the clinical, structural and psychological barriers to retention in care among women living with HIV in rural and peri-urban settings in Uganda. *BMC Infectious Diseases, 21*(1), 1–10. https://doi.org/10.1186/s12879-021-06684-6

Nardell, M. F., Adeoti, O., Peters, C., Kakuhikire, B., Govathson-Mandimika, C., Long, L., Pascoe, S., Tsai, A. C., & Katz. I. T. (2022). Men missing from the HIV care continuum in sub-Saharan Africa: a meta-analysis and meta-synthesis. *Journal of the International AIDS Society, 25*(3), e25889. https://doi.org/10.1002/jia2.25889

National Agency for Control of AIDS. (2021a). *Women, girls, gender equality and HIV in Nigeria: Facts sheet 2016.* https://naca.gov.ng/wp-content/uploads/2019/10/Fact-Sheet-Women-Girls-Gender-Equality-and-HIV-in-Nigeria.pdf

National Agency for the Control of AIDS. (2021b). *Nigeria HIV/AIDS indicator and impact survey. National summary sheet. Preliminary findings March 2019.* https://www.naca.gov.ng/naiis-national-summary-sheet/

National Agency for the Control of AIDS. (2021c). *Nigeria prevalence rate for 2019*. https://www.naca.gov.ng/nigeria-prevalence-rate/

National Agency for the Control of AIDS (NACA). (2019). *NAIIS South-South factsheet Vol 9 03/07/2019.* https://naca.gov.ng/wp-content/uploads/2019/03/NAIIS-SOUTH-SOUTH-ZONE-FACTSHEET_V0.9_030719-edits.pdf

National Bureau of Statistics. (2021). *2020 Statistical report on women and men in Nigeria.* https://www.nigerianstat.gov.ng › download

National Bureau of Statistics. (2019). *Statistical report on women and men in Nigeria*. https://nigerianstat.gov.ng/download/952.

National Bureau of Statistics. (2018). *2017 statistical report on women and men in Nigeria.* https://nigerianstat.gov.ng/download/784

National Bureau of Statistics. (2017). *Statistical report on women and men in Nigeria.* https://www.nigerianstat.gov.ng/

National Center for Injury Prevention and Control, Division of Violence Prevention. (2022). *The social-ecological model: A framework for prevention.* https://www.cdc.gov/violenceprevention/about/social-ecologicalmodel.html

National Institute for Allergy and Infectious Disease. (2020). *HIV/AIDS.* https://www.niaid.nih.gov/diseases-conditions/hivaids

National Institutes of Health Office of AIDS Research. (2020). *National HIV/AIDS strategy for the United States 2022–2025*. https://www.whitehouse.gov/wp-content/uploads/2021/11/National-HIV-AIDS-Strategy.pdf

Naugle, D. A., Tibbels, N. J., Hendrickson, Z. M., Dosso, A., Van Lith, L. M., Mallalieu, E. C., Kouadio, A. M., Kra, W., Kamara, D., Dailly-Ajavon, P., Cisse, A., Siefert-Ahanda, K., Thaddeus, S., Babalola, S., & Christopher, J. Hoffman. (2019). Bringing fear into focus: The intersections of HIV and masculine gender norms in Côte d'Ivoire. *PLoS ONE, 14*(10), e0223414. https://doi.org/10.1371/journal.pone.0223414

Negedu-Momoh, O. R., Balogun, O., Dafa, I., Etuk, A., Oladele, E. A., Adedokun, O., James, E., Pandey, S. R., Khamofu, H., Badru, T., Robinson, J., Mastro, T. D., & Torpey, K. (2021). Estimating HIV incidence in the Akwa Ibom AIDS indicator survey (AKAIS), Nigeria using the limiting antigen avidity recency assay. *Journal of the International AIDS Society, 24*(2), 1F. https://doi-org/10.1002/jia2.25669

NewsRx. (2019). Study data from Redeemer's University update understanding of HIV/AIDS (HIV/AIDS and economic growth: Evidence from West Africa. *AIDS*

Weekly, 777. https://link.gale.com/apps/doc/A589226956/EAIM?u=minn4020&sid=ebsco&xid=9038ed70

Ngaya, G. S. L., Yambiyo, B. M., Farra, A., Pelembi, P., Bere, A., Golongba, D., Kamadom, S., & Berlioz-Arthaud, A. (2021). Evaluation of the third 90 of the 90-90-90 Cascade for the period 2019-2020 in the Central African Republic. *World Journal of AIDS, 11*(4). https://doi.org/10.4236/wja.2021.114014

Nigerian Investment Promotion Commission. (2020). *Nigerian States–Akwa Ibom State.* https://nipc.gov.ng/nigeria-states/akwa-ibom-state/ 5

NIH's Office of AIDS Research. (2021). *Guidelines for the use of antiretroviral agents in pediatric HIV infection. Panel's recommendations for adherence to antiretroviral therapy in children and adolescents with HIV*. https://clinicalinfo.hiv.gov/en/guidelines/pediatric-arv/adherence-antiretroviral-therapy-children-and-adolescents-living-hiv

Nzelu, C. (2022). Stigma and discrimination's effect on HIV testing of pregnant women in Nigeria (Order No. 29066910). *Available from Dissertations & Theses @ Walden University. (2648081204).* https://www.proquest.com/dissertations-theses/stigma-discrimination-s-effect-on-hiv-testing/docview/2648081204/se-2?accountid=14872

Obidoa, C. A., M'Lan, C. E., & Schensul, S. L. (2012). Factors associated with HIV/AIDS sexual risk among young women aged 15-24 years in Nigeria. *Journal of public health in Africa, 3*(1), e15. https://doi.org/u10.4081/jphia.2012.e15

Ochieng-Ooko, V., Ochieng, D., Sidle, J. E., Holdsworth, M., Wools-Kaloustian, K., Siika, A. M., Yiannoutsos, C. T., Owiti, M., Kimaiyo, S., & Braitstein, P. (2010). Influence of gender on loss to follow-up in a large HIV treatment programme in Western Kenya. *Bull World Health Organ. 88*(9), 681-8. https://doi.org/10.2471/BLT.09.064329

Oduwole, O. W. (2020). Demographic factors associated with childhood obesity among women, infants, children (WIC) participants in 2014. *Walden Dissertations and Doctoral Studies*. https://academicguides.waldenu.edu/library

Office of Research and Doctoral Services. (2021). *Research ethics review process by I.R.B.* https://academicguides.waldenu.edu/research-center/research-ethics/review-process

Ogah, O. S., Okpechi, I., Chukwuonye, I. I., Akinyemi, J. O., Onwubere, B. J., Falase, A. O., Stewart, S & Sliwa, K. (2012). Blood pressure, prevalence of hypertension and hypertension related complications in Nigerian Africans: A review. *World J Cardiology, 4*(12), 327-340. https://dx.doi.org/10.4330/wjc.v4.i12.327

Ogaji, D, S & Igwebuike, O. P. (2021). Cross-sectional investigation of gender differences in health-related quality of life among HIV patients: Implications for gender mainstreaming in HIV management. *Pan African Medical Journal, 39*(201). https://doi.org/10.11604/pamj.2021.39.201.24420

Okoronkwo, I., Okeke, U., Chinweuba, A., & Iheanacho, P. (2013). Non adherence factors and sociodemographic characteristics of HIV-infected adults receiving

antiretroviral therapy in Nnamdi Azikiwe University Teaching Hospital, Nnewi, Nigeria. *AIDS*, 843794. https://doi.org/10.1155/2013/843794\

Olabode, S. O., Olateju, O. I., & Bakare, A. A. (2019). An assessment of the reliability of secondary data in management science research. *International Journal of Business and Management Review, 7*(3), 27-43. www.eajournals.org

Oladapo, O. T., Adetoro, O. O., Fakeye, O., Fakeye, O., Ekele, B. A., Fawole, A. O., Abasiattai, A., Kuti, O., Tukur, J., Ande, A, B., Dada, O. A., & the Nigerian Network for Reproductive Health Research and Training (NNRHRT). (2009). National data system on near miss and maternal death: Shifting from maternal risk to public health impact in Nigeria. *Reprod. Health, 6*(8). https://doi.org/10.1186/1742-4755-6-8

Oluniyi, P. E., Ajogbasile, F. V., Zhou, S., Fred-Akintunwa, I., Polyak, C. S., Ake, J. A., Tovanabutra, S., Iroezindu, M., Rolland, M., & Happi, C. T. (2022). HIV-1 drug resistance and genetic diversity in a cohort of people with HIV-1 in Nigeria. *AIDS, 36*(1), 137-146. https://doi.org/10.1097/QAD.0000000000003098

Omole, M. K., Adebayo, S. O., & Adisa, R. M. (2012). Investigation of factors affecting medication adherence among people living with HIV/AIDS under non-governmental organizations in Ibadan City, Nigeria. *Journal of Pharmaceutical and Biomedical Sciences, 21*(19). http://www.jpbms.info/index.php?option=com_docman&task=doc_download&gid=519&Itemid=48

Omosigho, O., Izevbuwa, O., Omolade, V., & Otojareri. K. (2023). Epidemiology and risk factors of oral Candidiasis among people living with HIV/AIDS in Ilorin, Kwara State, Nigeria. *Microbes and Infectious Diseases, 4*(1), 231–241. https://doi.org/10.21608/mid.2022.151041.1353

Onovo, A., Kalaiwo, A., Katbi, M., Ogorry, O., Jaquet, A., & Keiser, O. (2021). Geographical disparities in HIV Seroprevalence among men who have sex with men and people who inject drugs in Nigeria: Exploratory spatial data analysis. *JMIR Public Health Surveill, 7*(5), e19587. https://doi.org/10.2196/19587

Onu, k. A., Towolawi, A., Oluwasina, F., Onu, E. A., Obioma, U., Nwakanma, I., & Ogbang, D. (2016). Gender and HIV testing service uptake: Trend in Northern Nigeria. *Journal of AIDS Clinical Research, 7*(12). https://doi.org/10.4172/2155-6113.1000638

Oryokot, B., Kazibwe, A., Oluka, A., Miya, Y. & Etukoit, M. (2021) COVID-19 and HIV treatment interruption: A case study of the AIDS support organization (TASO) Mbale Clinic. *World Journal of AIDS, 11,* 199-215. https://doi.org/10.4236/wja.2021.114015.

Oyeledun, B., Oronsaye, F., Oyelade, T., Becquet, R., Odoh, D., Anyaike, C., Ogirima, F., Ameh, B., Ajibola, A., Osibo, B., Imarhiagbe, C., & Abutu, I. (2014). Increasing retention in care of HIV-positive women in PMTCT services through continuous quality improvement-breakthrough (CQI-BTS) series in primary and secondary health care facilities in Nigeria: a cluster randomized controlled trial. The Lafiyan Jikin Mata study. *Journal of Acquired Immune Deficiency*

Syndromes (1999), 67(Suppl 2), S125–S131. https://doi.org/10.1097/QAI.0000000000000320

Oyelere, R. U. (2007). *Disparities in Labor market outcomes across geopolitical regions in Nigeria: Fact or Fantasy? Discussion paper series. Forschungsinstitut zur Zukunft der Arbeit* [Institute for the Study of Labor September 2007: Discussion Paper No. 3082 September 2007]. https://d-nb.info/986005312/34

Ozoemene, J. (2021). *A powerful public private coalition to improve lives*. https://www.htfn.org/about-us/

Parrish, C., Basu, A., Fishman, P., Koama, J. B., Robin, E., Francois, K., Honoré, J. G., Van Onacker, J. D., & Puttkammer, N. (2021). Estimating the effect of increasing dispensing intervals on retention in care for people with HIV in Haiti. *EClinicalMedicine,* 38. https://doi.org/10.1016/j.eclinm.2021.101039

Patino, C. M., & Ferreira, J. C. (2018). Internal and external validity: can you apply research study results to your patients? *Jornal Brasileiro de Pneumologia: Publicacao oficial da Sociedade Brasileira de Pneumologia e Tisilogia, 44*(3), 183. https://doi.org/10.1590/S1806-37562018000000164

Polit, D. F. & Beck, C. T. (2010). Generalization in quantitative and qualitative research: Myths and strategies. *International Journal of Nursing Studies, 47*(11), 1451-8. https://doi.org/10.1016/j.ijnurstu.2010.06.004.

Poux, S. (2017, August 5). *Social-ecological model offers new approach to public health.* The Borgen Project. https://borgenproject.org/social-ecological-model/

Puskas, C., & Hogg, R. S. (2014). Unlocking adherence: is gender the key? *The Lancet HIV*. https://doi.org/10.1016/S2352-3018(14)00033-2

Ramadhani, H. O., Thielman, N. M., Landman, K. Z., Ndosi, E. M., Gao, F., Kirchherr, J. L, Shah, R., Shao, H. J., Morpeth, S. C., McNeill, J. D., Shao, J. F., Bartlett, J. A., & Crump, J. A. (2007). Predictors of incomplete adherence, virologic failure, and antiviral drug resistance among HIV-infected adults receiving antiretroviral therapy in Tanzania. *Clin Infect Dis.*, *45*(11), 1492-8. https://doi.org/ 10.1086/522991.

ReliefWeb. (2019). *New survey results indicate that Nigeria has an HIV prevalence of 1.4%.* https://reliefweb.int/report/nigeria/new-survey-results-indicate-nigeria-has-hiv-prevalence-14

ResarchArticles.com. (2019). *What is generalizability in research?* http://researcharticles.com/index.php/generalizability-research/

Roscoe, C & Hachey, D. M. (2020). *Retention in HIV care.* https://www.hiv.uw.edu/go/basic-primary-care/retention-care/core-concept/all

Ross, P. T., & Bibler Zaidi, N. L. (2019). Limited by our limitations. *Perspectives in Medical Education*, (4), 261-264. https://doi.org/10.1007/s40037-019-00530-x.

Rural Health Information Hub. (2022). *Ecological models.* https://www.ruralhealthinfo.org/toolkits/health-promotion/2/theories-and-models/ecological

Sabri, B., McFall, A. M., Solomon, S. S., Srikrishnan, A. K., Vasudevan, C. K., Anand, S., Celentano, D. D., Mehta, S. H., Kumar, S., & Lucas, G. M. (2017). Gender differences in factors related to HIV risk behaviors among people who inject drugs in North-East India. *PLoS ONE, 12*(1), e0169482. https://doi.org/10.1371/journal.pone.0169482

Saeed, B. Q., Al-Shahrabi, R., & Bolarinwa, O. A. (2021) Socio-demographic correlate of knowledge and practice toward COVID-19 among people living in Mosul-Iraq: A cross-sectional study. *PLoS ONE, 16*(3), e0249310. https://doi.org/10.1371/journal.pone.0249310

Sahay, S., Reddy, K. S., & Dhayarkar, S. (2011). Optimizing adherence to antiretroviral therapy. *The Indian Journal of Medical Research, 134*(6), 835–849. https://doi.org/10.4103/0971-5916.92629

Sakala J. J & Stone, W. (2020). I don't want to go for an HIV test out of fear that I might be positive: Barriers and facilitators to the uptake of HIV testing services among adolescents and young adults in Machinga district, Malawi. *Research Square*. https://doi.org/10.21203/rs.3.rs-42077/v1

Sana, B. Y. (2019). Risk factors associated with the contraction of Ebola virus disease in Liberia. *Walden Dissertations and Doctoral Studies.* https://academicguides.waldenu.edu/library

Sánchez Peña, S., del Mar Pastor Bravo, M., Cánovas Tomás, M. Á., Almansa Martínez, P., Peñalver Guillén, C., & Jiménez-Ruiz, I. (2021). Factors affecting adherence to antiretroviral treatment in women with HIV: A sequential mixed model

research design. *Enfermería Global, 20*(2), 18–34. https://doi.org/10.6018/eglobal.437711

Shah, G.H., Etheredge, G.D., Nkuta, L.M., Waterfield, K.C., Ikhile, O., Ditekemena, J., & Bernard, B.N.B. (2022). Factors associated with retention of HIV patients on antiretroviral therapy in care: Evidence from outpatient clinics in two provinces of the Democratic Republic of the Congo (DRC). *Trop. Med. Infect. Dis. 7*(229). https://doi.org/10.3390/ tropicalmed7090229

Singh, A. S. & Masuku, M. B. (2014). Sampling techniques & determination of sample size in applied statistics research: An overview. *International Journal of Economics, Commerce and Management, II*(11). http://ijecm.co.uk/

Slack, M.K. & Draugalis, J.R. (2001). Establishing the internal and external validity of experimental studies. *American Journal of Health-System Pharmacy,* 58(22), 2173–2181. https://doi.org/10.1093/ajhp/58.22.2173

Sohler, N. L., Li, X., & Cunningham, C. O. (2009). Gender disparities in HIV health care utilization among the severely disadvantaged: Can we determine the reasons? *AIDS Patient Care STDS, 23*(9), 775-83. https://doi.org/10.1089/apc.2009.0041.

Statista. (2022). *People living with HIV in Nigeria as of 2020.* https://www.statista.com/statistics/1128675/people-living-with-hiv-receiving-treatment-in-nigeria/

Suleiman, I. A & Momo, A. (2016). Adherence to antiretroviral therapy and its determinants among persons living with HIV/AIDS in Bayelsa state, Nigeria. *Pharmacy Practice (Granada), 14*(1). https://dx.doi.org/10.18549/PharmPract.2016.01.631

Sunday, O. A., Ameh, O. E., & Uchechukwu, A. (2017). Assessment of the HIV/AIDS impact on the Nigerian economy performance: An empirical analysis. *Journal of AIDS & Clinical Research, 8*(10). https://doi.org/10.4172/2155-6113.1000736

Suresh, K., & Chandrashekara, S. (2012). Sample size estimation and power analysis for clinical research studies. *Journal of Human Reproductive Sciences, 5*(1), 7–13. https://doi.org/10.4103/0974-1208.97779 (Retraction published Journal Human Reproduction Sciences. 2015 Jul-Sep;8(3):186)

Tamhane, A. R., Westfall, A. O., Burkholder, G. A., & Cutter, G. R. (2016). Prevalence odds ratio versus prevalence ratio: choice comes with consequences. *Statistics in Medicine, 35*(30), 5730–5735. https://doi.org/10.1002/sim.7059

Terrell, S.R. (2016). *Writing a proposal for your dissertation*. New York: The Guilford Press.

The Global Fund. (2019). *HIV, human rights, and gender equality* [Technical brief]. https://www.theglobalfund.org/media/6348/core_hivhumanrightsgenderequality_technicalbrief_en.pdf

The Joint United Nations Programme on HIV/AIDS (UNAIDS). (2022a). *Identification of fast-spreading HIV variant provides evidence of urgency to halt the pandemic and reach all with testing and treatment* [Press statement]. https://www.unaids.org/en/resources/presscentre/pressreleaseandstatementarchive/2022/february/20220207_hiv-variant

The Joint United Nations Programme on HIV/AIDS (UNAIDS). (2022b). *People living with HIV who have suppressed viral loads.*

https://indicatorregistry.unaids.org/indicator/people-living-hiv-who-have-suppressed-viral-loads

The Joint United Nations Programme on HIV/AIDS (UNAIDS). (2022c). *Nigeria country fact sheet 2020.* https://www.unaids.org/en/regionscountries/countries/nigeria

The Joint United Nations Programme on HIV/AIDS (UNAIDS). (2019). *New survey results indicate that Nigeria has an HIV prevalence of 1.4%: Expanded data collection and analysis provides better understanding of HIV epidemic in Nigeria.* [Press release]. https://www.unaids.org/en/resources/presscentre/pressreleaseandstatementarchive/2019/march/20190314_nigeria#:~:text=The%20South%2DSouth%20zone%20of,North%20West%20zone%20(0.6%25)

The Joint United Nations Programme on HIV/AIDS (UNAIDS). (2018). *Integrating human rights and gender equality into UNAIDS evaluation, guidance document: UNAIDS evaluation unit: July 2018.* https://www.unaids.org/sites/default/files/Integrating%20Human%20Rights%20and%20Gender%20Equality%20into%20UNAIDS%20evaluations.pdf

The Joint United Nations Programme on HIV/AIDS. (2017). *WHO, UNAIDS statement on HIV testing services: New opportunities and ongoing challenges.* https://www.unaids.org/sites/default/files/media_asset/2017_WHO-UNAIDS_statement_HIV-testing-services_en.pdf

The Joint United Nations Programme on HIV/AIDS. (2015). *Understanding Fast-Tract: Accelerating action to end the AIDS epidemic by 2030.* https://www.unaids.org/sites/default/files/media_asset/201506_JC2743_Understanding_FastTrack_en.pdf

The Joint United Nations Programme on HIV/AIDS.UNAIDS/WHO policy. (2004). *Statement on HIV testing* [Policy statement]. https://data.unaids.org/una-docs/hivtestingpolicy_en.pdf

The Pennsylvania State University. (2022). *9.1 - Multi-stage sampling: Two stages with S.R.S at each stage.* https://online.stat.psu.edu/stat506/lesson/9/9.1

The Sun Nigeria. (2017, November 30). *Akwa Ibom, USAID hold first state AIDS indicator survey*. https://www.sunnewsonline.com/akwa-ibom-usaid-hold-first-state-aids-indicator-survey/

Torres-Robles, A., Benrimoj, S. I., Gastelurrutia, MAMA., Martinez-Martinez, F., Peiro, T., Perez-Escamilla, B., Rogers, K., Valverde-Merino, I., Varas-Doval, R., & Garcia-Cardenas, V. (2022). Effectiveness of a medication adherence management intervention in a community pharmacy setting: A cluster randomized controlled trial. *BMJ Quality & Safety, 31*(2), 105-115. https://qualitysafety.bmj.com/content/31/2/105

Trochim, W. M. K. (2006). *Threats to internal and external validity*. https://socialresearchmethods.net/kb/external.php

Turner, B., Laine, C., Cosler, L. & Walter, H. (2003). Health care delivery with antiretroviral adherence in HIV-infected drug users. *Journal of Internal Medicine. 18*(4), 218-257. doi: 10.1046/j.1525-1497.2003.20122.x.

Umeokonkwo, C. D., Onoka, C. A., Agu, P. A., Ossai, E. N., Balogun, M. S., & Ogbonnaya, L. U. (2019). Retention in care and adherence to HIV and AIDS treatment in Anambra State Nigeria. *BMC Infectious Disease,19*(654). https://doi.org/10.1186/s12879-019-4293-8

UNHCR Nigeria. (2020). *Akwa Ibom: Reference map. HDX updated: January 2020.* http://www.unchr.org/

U.S. Department of Health & Human Services. (2011). *Chapter 1 Community engagement: Definitions and organizing concepts from the literature in models of community engagement models and frameworks for the practice of community engagement.* [NIH Publication No. 11-7782 Printed June 2011]. https://www.atsdr.cdc.gov/communityengagement/index.html

United States Department of State. (2020). *2019 country reports on human rights practices: Nigeria.* https://www.state.gov/reports/2019-country-reports-on-human-rights-practices/nigeria/

University of Southampton. (2011). *Using statistical regression methods in education research.* https://www.restore.ac.uk/srme/www/fac/soc/wie/research-new/srme/index.html

U.S. Mission Nigeria. (2017). *Akwa Ibom releases first-ever AIDS indicator survey funded by USAID*. https://ng.usembassy.gov/akwa-ibom-releases-first-ever-aids-

indicator-survey-fundedusaid/#:~:text=The%20overall%20prevalence%20rate%20of,and%200.42%20percent%20among%20males).

U. S. President's Emergency Plan for AIDS Relief. (2020). *Nigeria country operational plan (COP) 2020 strategic direction summary released (March 18, 2020).* https://www.state.gov/wp-content/uploads/2020/07/COP-2020-Nigeria-SDS-Final-.pdf

U. S President's Emergency Plan for AIDS Relief. (2019). *TX_PVLS, PEPFAR, MER 2.0 (Version 2.4), September 2019, monitoring, evaluation, and reporting.* https://www.state.gov/wp-content/uploads/2019/10/PEPFAR-MER-Indicator-Reference-Guide-Version-2.4-FY20.pdf

Uzochukwu, B. S. C., Onwujekwe, O. E., Onoka, A. C., Okoli, C., Uguru, N. P., & Chukwuogo, O. I. (2009). Determinants of non-adherence to subsidized anti-retroviral treatment in southeast Nigeria. *Health Policy and Planning*, *24*(3),189-196. https://doi.org/10.1093/heapol/czp006

Valdiserri, R. (2012, July 19). HIV/AIDS treatment cascade helps identify gaps in care, retention. *Explore HIV Resources*. https://www.hiv.gov/blog/hivaids-treatment-cascade-helps-identify-gaps-in-care-retention/.

Vanguard Media Limited. (2022, January 30). *Private sector stakeholders to launch N62.1 Billion HIV trust fund of Nigeria*. https://www.vanguardngr.com/2022/01/private-sector-stakeholders-to-launch-n62-1-billion-hiv-trust-fund-of-nigeria/

Vanguard Media Limited. (2017, April 3). *Akwa Ibom, FHI 360 to conduct 1st State AIDS indicator survey*. https://www.vanguardngr.com/2017/04/akwa-ibom-fhi-360-conduct-1st-state-aids-indicator-survey/

Wang X, & Cheng Z. (2020). Cross-sectional studies: strengths, weaknesses, and recommendations. *Chest*, 58(1S), S65-S71. https://doi.org/10.1016/j.chest.2020.03.012.

Watthananon, J., & Mingkhwan, A. (2012). Optimizing knowledge management using knowledge map. *Procedia Engineering*, 32, 1169–1177. https://doi.org/10.1016/j.proeng.2012.02.073

Wilde, L. (2018). The impact of transmission mode on HIV/AIDS medication adherence. *Walden Dissertations and Doctoral Studies*. https://academicguides.waldenu.edu/library

World Health Organization. (2022a). *Consolidated guidelines on HIV prevention, testing, treatment, service delivery and monitoring: Recommendations for a public health approach [CORRIGENDA]*. https://cdn.who.int/media/docs/default-source/hq-hiv-hepatitis-and-stis-library/9789240031593_corrigenda_final_rev_7dec2021.pdf?sfvrsn=d517893c_7

World Health Organization. (2022a). *Why the HIV epidemic is not over.* https://www.who.int/news-room/spotlight/why-the-hiv-epidemic-is-not-over

World Health Organization. (2022b). *HIV/AIDS*. https://www.who.int/data/gho/data/themes/hiv-aids

World Health Organization. (2021). *Latest HIV estimates and updates on HIV policies uptake, December 2021*. https://cdn.who.int/media/docs/default-source/hq-hiv-hepatitis-and-stis-library/2021_global_summary_web_v32.pdf?sfvrsn=4b8815ad_37

World Health Organization Regional Office for Africa. (2017). *End HIV/AIDS by 2030: HIV/AIDS: Framework for action in the WHO African region, 2016 – 2020*. https://apps.who.int/iris/bitstream/handle/10665/259638/EndAIDS-eng.pdf;sequence=1

Yakob, B., & Ncama, B. P. (2016). A socio-ecological perspective of access to and acceptability of HIV/AIDS treatment and care services: A qualitative case study research. *BMC Public Health, 16*(155). https://doi.org/10.1186/s12889-016-2830-6

Yaya, S., Ghose, B., Udenigwe, O., Shah, V., Hudani, A., & Ekholuenetale, M. (2019). Knowledge and attitude of HIV/AIDS among women in Nigeria: A cross-sectional study, *European Journal of Public Health, 29*(1), 111–117. https://doi.org/10.1093/eurpub/cky131

Yockey, R. D. (2011). *SPSS demystified: A step by step guide to successful data analysis* (2nd ed.). Upper Saddle River, NJ: Prentice Hall

Yusuf, A. B. (2019). Adherence to ART among HIV infected female sex workers in Nigeria. *Walden Dissertations and Doctoral Studies*. https://academicguides.waldenu.edu/library

Appendix A: Letter of Introduction

WALDEN UNIVERSITY

26 July 2022

FHI 360 Team,

Letter of Introduction

The bearer of this letter Iniobong Udoffort Akai (Registration No: [redacted], is a Public Health PhD candidate at Walden University who intends to use the dataset from the **Akwa Ibom HIV/AIDS indicator survey** for his dissertation.

Kindly provide him with the necessary assistance that he may need.

Thank you for your help.

Peace,

Pete

Peter B. Anderson, Ph.D., FSSSS, Professor
Senior Contributing Faculty, Ph.D. in Public Health
College of Health Professions, Walden University
100 Washington Ave. South, Suite 1210
Minneapolis, MN 55401
Peter.Anderson@mail.Waldenu.edu

Appendix B: Research Data Use Agreement

359 Blackwell Street, Suite 200
Durham, NC 27701

RESEARCH DATA USE AGREEMENT

This Data Use Agreement is made and entered into on 03 August 2022 by and between FHI 360, Nigeria. No.8; Yedseram Crescent, P.M. B. 44, Abuja, Nigeria. FHI 360 is a North Carolina, USA, non-profit corporation with its principal place of business at 359 Blackwell Street, Suite 200, Durham, NC, USA 27701, hereafter "Holder" and Iniobong Akai, hereafter "Recipient."

1. This agreement sets forth the terms and conditions pursuant to which Holder will disclose certain protected health information, hereafter "PHI" in the form of a Limited Data Set to the Recipient.

2. Terms used, but not otherwise defined, in this Agreement shall have the meaning given the terms in the HIPAA Regulations at 45 CFR Part 160-164.

3. Permitted Uses and Disclosures
   - 3.1 Except as otherwise specified herein, the Recipient may make all uses and disclosures of the Limited Data Set necessary for his dissertation work at the Walden University, United States of America, described herein: Strengthening Integrated Delivery of HIV/AIDS Services (SIDHAS) project conducted in Nigeria by FHI 360 [PHSC protocol number 1230756]

4. Recipient Responsibilities
   - 4.1 Recipient will not use or disclose the Limited Data Set for any purpose other than permitted by this Agreement pertaining to the Research Project or as required by law;
   - 4.2 Recipient will use appropriate administrative, physical and technical safeguards to prevent use or disclosure of the Limited Data Set other than as provided for by this Agreement;
   - 4.3 Recipient will report to the Holder any use or disclosure of the Limited Data Set not provided for by this Agreement of which the Recipient becomes aware within 15 days of becoming aware of such use or disclosure;
   - 4.4 Recipient will ensure that any agent, including a subcontractor, to whom it provides the Limited Data Set, agrees to the same restrictions and conditions that apply through this Agreement to the Recipient with respect to the Limited Data Set;
   - 4.5 Recipient will not identify the information contained in the Limited Data Set; and
   - 4.6 Recipient will not contact the individuals who are the subject of the PHI contained in the Limited Data Set.

5. Term and Termination

5.1 The terms of this Agreement shall be effective as of 03 August 2022 and shall remain in effect until all PHI in the Limited Data Set provided to the Recipient is destroyed or returned to the Holder.

5.2 Upon the Holder's knowledge of a material breach of this Agreement by the Recipient, the Holder shall provide an opportunity for the Recipient to cure the breach or end the violation. If efforts to cure the breach or end the violation are not successful within the reasonable time period specified by the Holder, the Holder shall discontinue disclosure of PHI to the Recipient and report the problem to the FHI 360 Legal Officer. The Holder shall immediately discontinue disclosure of the Limited Data Set to the Recipient if the Holder determines cure of the breach is not possible.

6. General Provisions

6.1 Recipient and Holder understand and agree that individuals who are the subject of Protected Health Information are not intended to be third-party beneficiaries of this Agreement.

6.2 This Agreement shall not be assigned by the Recipient without the prior written consent of the Holder.

6.3 Each party agrees that it will be responsible for its own acts and the results thereof to the extent authorized by law and shall not be responsible for the acts of the other party or the results thereof.

IN WITNESS WHEREOF, the parties hereto execute this agreement as follows:

FHI 360 Nigeria
Dr. Hadiza Khamofu, EpiC Nigeria, Project Director

Date: August 5, 22

By: _____
(Title person with authority to sign agreement for the holder of the data)

Kristen Lingo

FHI 360 HQ
Kristen Lingo, Corporate Administration - Assistant General Counsel

Date: August 9 2022

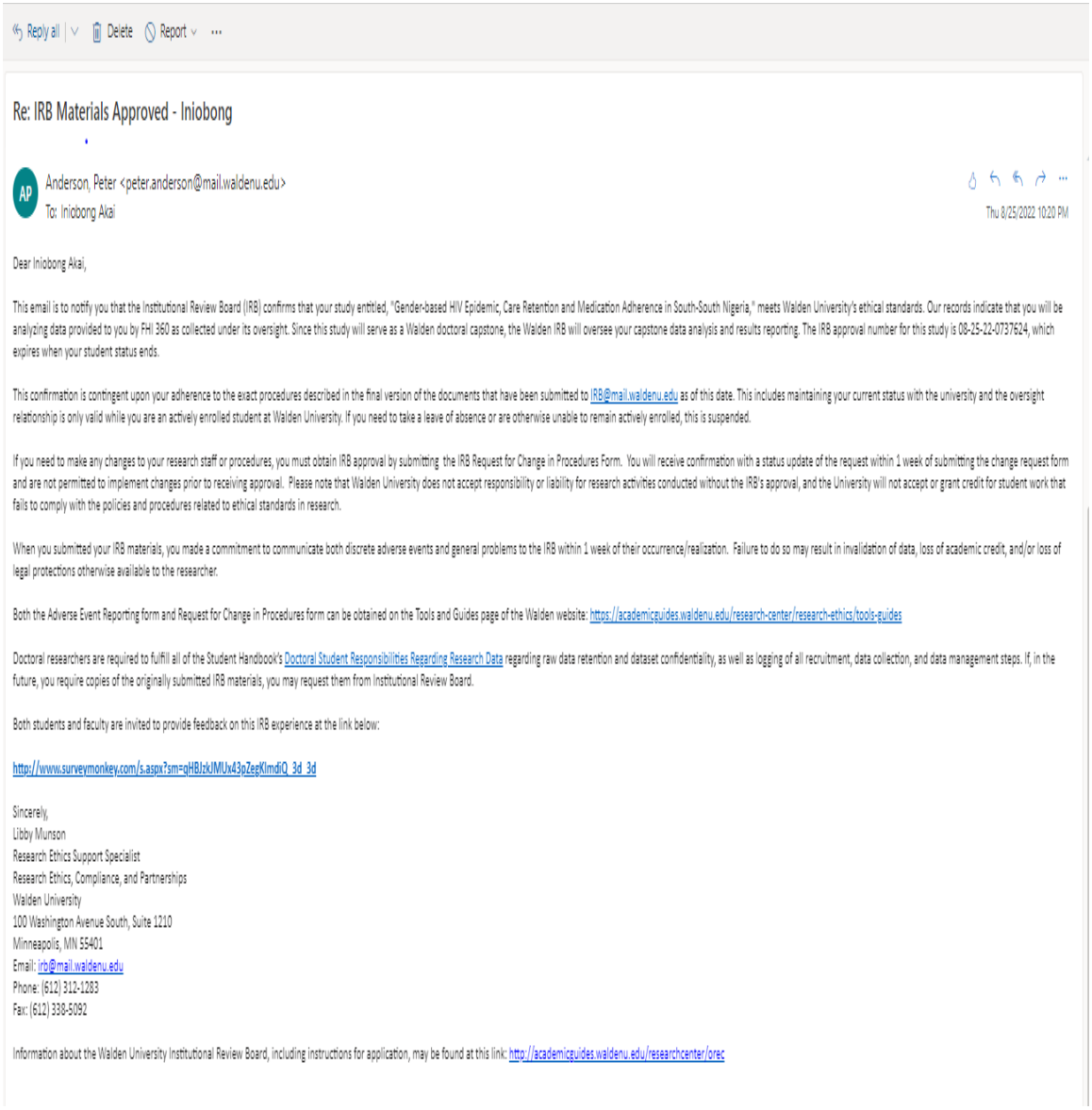
By: Kristen Lingo

Iniobong Akai (Recipient)

Date: 5 Aug 2022

_____

Appendix C: Approval



Reply all | Delete | Report | ...

Re: IRB Materials Approved - Iniobong

AP Anderson, Peter <peter.anderson@mail.waldenu.edu>
To: Iniobong Akai

Thu 8/25/2022 10:20 PM

Dear Iniobong Akai,

This email is to notify you that the Institutional Review Board (IRB) confirms that your study entitled, "Gender-based HIV Epidemic, Care Retention and Medication Adherence in South-South Nigeria," meets Walden University's ethical standards. Our records indicate that you will be analyzing data provided to you by FHI 360 as collected under its oversight. Since this study will serve as a Walden doctoral capstone, the Walden IRB will oversee your capstone data analysis and results reporting. The IRB approval number for this study is 08-25-22-0737624, which expires when your student status ends.

This confirmation is contingent upon your adherence to the exact procedures described in the final version of the documents that have been submitted to IRB@mail.waldenu.edu as of this date. This includes maintaining your current status with the university and the oversight relationship is only valid while you are an actively enrolled student at Walden University. If you need to take a leave of absence or are otherwise unable to remain actively enrolled, this is suspended.

If you need to make any changes to your research staff or procedures, you must obtain IRB approval by submitting the IRB Request for Change in Procedures Form. You will receive confirmation with a status update of the request within 1 week of submitting the change request form and are not permitted to implement changes prior to receiving approval. Please note that Walden University does not accept responsibility or liability for research activities conducted without the IRB's approval, and the University will not accept or grant credit for student work that fails to comply with the policies and procedures related to ethical standards in research.

When you submitted your IRB materials, you made a commitment to communicate both discrete adverse events and general problems to the IRB within 1 week of their occurrence/realization. Failure to do so may result in invalidation of data, loss of academic credit, and/or loss of legal protections otherwise available to the researcher.

Both the Adverse Event Reporting form and Request for Change in Procedures form can be obtained on the Tools and Guides page of the Walden website: https://academicguides.waldenu.edu/research-center/research-ethics/tools-guides

Doctoral researchers are required to fulfill all of the Student Handbook's Doctoral Student Responsibilities Regarding Research Data regarding raw data retention and dataset confidentiality, as well as logging of all recruitment, data collection, and data management steps. If, in the future, you require copies of the originally submitted IRB materials, you may request them from Institutional Review Board.

Both students and faculty are invited to provide feedback on this IRB experience at the link below:

http://www.surveymonkey.com/s.aspx?sm=qHBJzkJMUx43pZegKlmdiQ_3d_3d

Sincerely,
Libby Munson
Research Ethics Support Specialist
Research Ethics, Compliance, and Partnerships
Walden University
100 Washington Avenue South, Suite 1210
Minneapolis, MN 55401
Email: irb@mail.waldenu.edu
Phone: (612) 312-1283
Fax: (612) 338-5092

Information about the Walden University Institutional Review Board, including instructions for application, may be found at this link: http://academicguides.waldenu.edu/researchcenter/orec

Appendix D: AKAIS Adult Individual Questionnaire (All Participants ≥15 years)

Contents

LANGUAGE AND INFORMED CONSENT

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT	AKAIS ONLY	NOTES
1		FIRST NAME OF THE PARTICIPANT FROM HOUSEHOLD ROSTER CONFIRM NAME WITH PARTICIPANT	FIRST NAME: _____				

2		AGE OF PARTICIPANT FROM HOUSEHOLD ROSTER ASK PARTICIPANT: "How old were you at your last birthday?" IF AGE DIFFERENT FROM HOUSEHOLD ROSTER, PLEASE VERIFY CORRECT AGE OF PARTICIPANT	AGE: _____	MUST BE >14 YEARS			
3		SCAN BARCODE OF PARTICIPANT					

4		RECORD SEX OF THE RESPONDENT	MALE = 1 FEMALE = 2				
5		TO INTERVEIWER: FOLLOW THE NEXT STEPS 1) ASSESS (NAME)'S ELIGIBILITY (LANGUAGE, HEARING ABILITY, COGNATIVE ABILITY) 2) Consent (NAME)					
6		FOR THE INTERVIEWER, DON'T READ OUT LOUD Is (NAME) eligible for the survey based on assessment (STEP 1)?	YES = 1 NO = 2	IF YES 8			

7		Reason for ineligibility:	HEARING DISABILITY=1 DOES NOT SPEAK A LANGUAGE THE SURVEY TEAM CAN ACCOMMODATE=2 VISUAL IMPAIRMENT=3 COGNITIVE DISABILITY=4 OTHER=98 (SPECIFY)	END INTERVIEW			
8		FROM CONSENT FORM: Did you consent to take part?	YES = 1 NO = 2	IF YES, → 10			
9		What are the reason that you do not want to participate in the survey? SELECT ALL THAT APPLY	NO TIME= 1 NOT COMFORTABLE WITH INTERVIEW= 2 DOESN'T LIKE QUESTIONS ON SEX= 3 DOESN'T LIKE BLOOD DRAW= 4 DOESN'T WANT TO GET RESULTS= 5 WORRIES ABOUT CONFIDENTIALITY= 6 DOESN'T WANT TO BE TESTED FOR HIV=7 ALREADY KNOWS HIV POSITIVE=8 OTHER (SPECIFY)=96 _____ _____ REFUSES TO SAY= 99	END INTERVIEW			
10		What Language do you prefer for our discussion today?	ENGLISH=1 ANNANG=2 IBIBIO=3 ORO=4 PIDGIN=5		C		

MODULE 1: RESPONDENT BACKGROUND

NO.	VAR NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT	AKAIS ONLY	NOTES
THANK YOU FOR AGREEING TO PARTICIPATE IN THIS SURVEY. THE FIRST SET OF QUESTIONS IS ABOUT YOUR LIFE IN GENERAL. AFTERWARDS, WE WILL MOVE ON TO OTHER TOPICS.							
101		What is your ethnic group/tribe?	ANNANG=1 IBIBIO=2 ORON=3 EFIK=4 YORUBA=5 IGBO = 6 HAUSA = 7 OTHER (SPECIFY) = 96 _____ _____		S		
102		What is your religion?	ISLAM= 1 CHRISTIAN=2 TRADITIONAL= 3 NO RELIGION=4 OTHER (SPECIFY)=96 _____ _____ _ DON'T KNOW=98 REFUSED TO SAY=99		S		
102 B		What is your denomination?	PROTESTANT=1 CATHOLIC=2 PENTECOSTAL= 3				

NO.	VAR NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT	AKAIS ONLY	NOTES

			OTHER (SPECIFY)=96 _____ _____ __ DON'T KNOW=98 REFUSED TO SAY=99				
103		Have you ever attended school?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY = 99	IF NO, DK, REFUSED 107	C		
104		Are you enrolled in school?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED = 99	IF DK, REFUSED 107	C		

NO.	VARNAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT	AKAIS ONLY	NOTES
105		What is your highest level of education attained? READ ALL RESPONSES ALOUD	NONE = 1 SOME PRIMARY = 2 PRIMARY = 3 SOME SECONDARY = 4 SECONDARY = 5 POST-SECONDARY/TERTIARY = 6 QUR'ANIC ONLY=7 DON'T KNOW=98 REFUSED TO SAY=99	IF DK, REFUSED 107	C		
106		What is the highest class/form you completed at that level?	CLASS/FORM ____ DON'T KNOW = 98 REFUSED = 99	SKIP IF QUR'ANIC SCHOOL	C		

107		Have you done any work in the last 12 months for which you received cash or in kind as payment?	YES = 1 NO = 2 DON'T KNOW=98 REFUSED TO SAY=99	IF NO, DK REFUSED → NEXT MODULE	C		
108		Have you done any work in the last seven days for which you received cash or in kind as payment?	YES = 1 NO = 2 DON'T KNOW=98 REFUSED TO SAY=99		C		
109		What do you do for a living?	DIRECTOR/UPPER MANAGEMENT= 1 OTHER MANAGEMENT= 2 SALES MANAGER/ REPRESENTATIVE/ INSURANCE BROKER=3				

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT	AKAIS ONLY	NOTES

		PROBE FOR ALL ANSWERS, TICK ALL THAT APPLY	PROFESSIONAL /SPECIALIST=4 SELF EMPLOYED/OWN SMALL BUSINESS=5 SELF EMPLOYED (INFORMAL SECTOR /HAWKERS/VENDORS ETC.) =6 BLUE COLLAR SKILLED & SEMI SKILLED=7 UNSKILLED=8 CLERK/CLERICAL=9 CIVIL SERVANT=10 FARMER/FORESTRY/FISHING/MINING=11 HOUSEWIFE=12 PENSIONER/RETIRED=13 UNEMPLOYED=14 STUDENT=15 OTHER(SPECIFY)=96 _____ _____ __ DON'T KNOW=98 REFUSED TO SAY=99				
110		How long have you been living in this community? IF LESS THAN ONE YEAR, RECORD '00" YEARS	NUMBER. OF YEARS _ _ ALWAYS = 95 VISITOR = 97 DON'T KNOW = 98 REFUSED TO SAY = 99				
NO.	VARNAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT	AKAIS ONLY	NOTES

111		In the last 12 months, have you travelled to anywhere outside your community?	YES=1 NO=2 DON'T KNOW = 98 REFUSED TO SAY = 99	IF NO 201			
112		How many times did you travel and slept away in the last 12 months?	NUMBER OF TIMES_ _ DON'T KNOW = 98 REFUSED TO SAY = 99				
113		How many of these trips were you gone for one month or greater?	NUMBER OF TIMES_ _ DON'T KNOW = 98 REFUSED TO SAY = 99	CAN'T BE >112			

MODULE 2: MARRIAGE

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT	AKAIS ONLY	NOTES
[INTERVIEWER READ]: NOW I WOULD LIKE TO ASK YOU ABOUT YOUR CURRENT AND PREVIOUS RELATIONSHIPS AND/OR MARRIAGES.							
201		Have you ever been married or lived with a partner as if married?	YES = 1 NO = 2 REFUSED TO SAY = 99	IF NO, REFUSED 301	C		
202		At what age were you first married?	AGE AT MARRIAGE: __ __ DON'T KNOW = 98 REFUSED TO SAY = 99		S		

203		Have you ever been widowed? That is, did a spouse ever pass away while you were still married or living with them?	YES = 1 NO = 2 REFUSED TO SAY = 99		S		
204		What is your current marital status? Are you married, living together with someone as if married, widowed, divorced, or separated?	MARRIED = 1 LIVING WITH A PARTNER AS IF MARRIED = 2 WIDOWED = 3 DIVORCED = 4 SEPARATED =5 REFUSED TO SAY = 99	WIDOWED, DIVORCED, SEPARATED, REFUSED → 301	C		

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT	AKAIS ONLY	NOTES
[INTERVIEWER READ]: NOW I WOULD LIKE TO ASK YOU SEVERAL QUESTIONS ABOUT YOUR CURRENT SPOUSE OR PARTNER							
205		How many wives do you have?	NO. OF WIVES: __ REFUSED TO SAY = 99	IF REFUSED → 301 MALES ONLY. SKIP FEMALE	C		
206		How many wives does your husband have?	NO. OF WIVES: __ __ DON'T KNOW=98 REFUSED TO SAY = 99	IF 1, DK, REFUSED → 210 FEMALES ONLY			

207		The Household Schedule listed [INSERT NUMBER OF REPORTED PARTNERS] household members as your wives/partners. Are all of the listed household members your wives/partners who live in the household? Interviewer: confirm the number from the household roster	YES = 1 NO = 2 REFUSED TO SAY = 99	IF NO, REFUSED ⍰209 MALES ONLY SKIP IF FEMALE	C		

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT	AKAIS ONLY	NOTES
		SCAN THE BARCODE OF THE WIFE FROM THE HOUSEHOLD LISTING					
208		Is [NAME] your wife/partner? REPEAT FOR EACH WIFE/PARTNER	YES = 1 NO = 2 REFUSED TO SAY = 99	MALES ONLY SKIP IF FEMALE	C		
209		Does [NAME] live in the household? REPEAT FOR EACH WIFE/PARTNER	YES = 1 NO = 2 REFUSED TO SAY = 99	MALES ONLY SKIP IF FEMALE	C		
210		Do you have additional spouse(s)/partner(s) that live with you?	YES = 1 NO = 2 REFUSED TO SAY = 99	IF NO, REFUSED ⍰212 MALES ONLY SKIP IF FEMALE	C		

211		How many additional spouse(s)/partners(s) live with you?	NUMBER OF SPOUSES OR LIVE-IN PARTNERS _ _	MALES ONLY SKIP IF FEMALE	C		

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT	AKAIS ONLY	NOTES
212		What is the name of your spouse/partner that lives with you?	NAME OF SPOUSE/PARTNER ___ DON'T KNOW = 98 REFUSED = 99	MALES ONLY SKIP IF FEMALE	C		
213		Do you have additional spouse(s)/partner(s) that live elsewhere?	YES = 1 NO = 2 REFUSED TO SAY = 99	IF NO, REFUSED →301 MALES ONLY SKIP IF FEMALE		Y	
214		How many wives or live-in partners do you have who live elsewhere?	NUMBER OF ADDITIONAL SPOUSE(S)/PARTNERS ___ DON'T KNOW = 98 REFUSED = 99	MALES ONLY SKIP IF FEMALE CANNOT BE >205	C		
215		Is your husband or partner living with you now or is he staying elsewhere?	LIVING TOGETHER = 1 STAYING ELSEWHERE = 2 DON'T KNOW = 98 REFUSE TO ANSWER = 99	IF STAYING ELSEWHERE, DK, REFUSED →218 IF LIVING TOGETHER & LISTED IN HH SCHEDULE	C		

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT	AKAIS ONLY	NOTES
				215 FEMALES ONLY SKIP IF MALE			
		SCAN THE BARCODE OF THE HUSBAND FROM THE HOUSEHOLD LISTING					
216		The household schedule listed [NAME OF HUSBAND/PARTNER] as your husband/partner who is living here. Is that correct?	YES=1 NO=2 DON'T KNOW = 98 REFUSED TO SAY = 99	IF YES, DK, REFUSED 218 FEMALES ONLY SKIP IF MALE	C		
217		Is your spouse/partner that lives with you on the HH roster?	LISTED ON THE HH ROSTER = 1 NOT LISTED IN HOUSEHOLD = 96	IF LISTED 218 FEMALES ONLY SKIP IF MALE	C		
		SCAN THE BARCODE OF THE SPOUSE/PARTNER FROM THE HOUSEHOLD LISTING					
NO.	VARNAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT	AKAIS ONLY	NOTES
218		What is the name of your spouse/partner that lives with you?	NAME OF SPOUSE/PARTNER ___ DON'T KNOW = 98 REFUSED = 99	FEMALES ONLY SKIP IF MALE	C		

219		Does your husband or partner have other wives or does he live with other women as if married?	YES=1 NO=2 DON'T KNOW = 98 REFUSED TO SAY = 99	IF NO, DK, REFUSED 301 FEMALES ONLY SKIP IF MALE	C		
220		Including yourself, how many wives does your husband have?	NO. OF WIVES: __ __ DON'T KNOW=98 REFUSED TO SAY = 99	FEMALES ONLY SKIP IF MALE	C		

MODULE 3: REPRODUCTIVE HEALTH

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT	AKAIS ONLY	NOTES
[INTERVIEWER READ]: NOW I WOULD LIKE TO ASK YOU QUESTIONS ABOUT YOUR PREGNANCIES AND YOUR CHILDREN				IF MALE 354			
301		How many times have you been pregnant? Include current pregnancy CODE '00' IF NONE.	TIME(S) ___ NONE = 00 REFUSED TO SAY = 99	IF NONE, REFUSED 354	C		
302		Have you ever had a pregnancy that resulted in a live birth? A live birth is when the baby shows signs of life, such as breathing, beating of the heart or movement.	YES = 1 NO = 2 REFUSED TO SAY = 99	IF NO, REFUSED 354	C		

303		How many children have you given birth to in the last three years? This includes babies that were born alive but later died.	NUMBER OF BABIES ___ DON'T KNOW = 98 REFUSED TO SAY = 99	IF ZERO, DK, RE-FUSED →354	C		

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT	AKAIS ONLY	NOTES
NOW I WOULD LIKE TO ASK YOU SOME QUESTIONS ABOUT THE LAST PREGNANCY THAT RESULTED IN A LIVE BIRTH WITH IN THE LAST THREE YEARS. SKIP TO 354 IF NO LIVE BIRTH IN THE LAST THREE YEARS.							
304		Did your last pregnancy result in birth to twins or more?	YES = 1 NO = 2 REFUSED TO SAY = 99				
305		What is the NAME of the baby/babies you delivered in your last pregnancy? IF MULTIPLE BIRTH, LIST THE NAMES OF TWINS AND TRIPLETS. IF THE CHILD WAS NOT NAMED BEFORE DEATH, INPUT BIRTH 1 (BIRTH 2, BIRTH 3 FOR MULTIPLE) ETC	INITIALS _____ INITIALS _____ INITIALS _____				

306		When did you give birth to (NAME)?	DATE: DAY __ __ DON'T KNOW = 98 REFUSED TO SAY = 99 MONTH __ __ DON'T KNOW = 98 REFUSED = 99 YEAR __ __ __ __	MUST < 3 YEARS FROM TODAY'S DATE		Y	
			DON'T KNOW =9998 REFUSED TO SAY = 9999				
307		How old was (NAME) at his/her last birthday? RECORD AGE IN YEARS IF LESS THAN 1 YEAR, CODE '00'	YEARS __ __ DON'T KNOW = 98 REFUSED = 99	LESS THAN 4 YEARS			
308		Is (INITIALS) still alive?	YES = 1 NO = 2 REFUSED TO SAY = 99	REPEAT FOR MULTIPLES IF YES→311	C		
309		How old was (NAME) when he/she died?	YEARS ____ DON'T KNOW = 98 REFUSED = 99	REPEAT FOR MULTIPLES			
310		How old was (NAME) in months when he/she died?	MONTHS _____ DON'T KNOW = 98 REFUSED = 99	REPEAT FOR MULTIPLES			

311		Is (INITIALS) a boy or a girl?	BOY(S)=1 GIRL(S)=2 REFUSED TO SAY = 99	REPEAT FOR MULTIPLES			

312		Is (INITIALS) living with you?	YES = 1 NO = 2 REFUSED = 99	REPEAT FOR MULTIPLES ONLY IF BABY IS ALIVE FROM 308 IF NO 314			
313		SCAN THE BARCODE FROM THE HOUSEHOLD ROSTER					
314		Were you ever tested for HIV before your pregnancy with (NAME)?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY = 99	IF NO, DK, REFUSED 317			
315		Did you test positive for HIV before your pregnancy with (NAME)?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY = 99	IF NO, DK, REFUSED 317			
316		Were you taking ARVs or HIV medications, before you were pregnant with (NAME)?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY = 99				

317		When you were pregnant with (NAME), did you go to a health facility for antenatal care (ANC)?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY = 99	IF YES 319	C		
318		What was your main reason for not attending antenatal care when you were pregnant with (NAME)? SELECT ONLY ONE OPTION PROBE FOR THE MAIN REASON	THE CLINIC IS TOO FAR AWAY = 1 COULD NOT TAKE TIME OFF WORK/TOO BUSY = 2 COULD NOT AFFORD TO PAY FOR THE VISIT = 3 DID NOT TRUST THE CLINIC STAFF = 4 RECEIVED CARE AT HOME = 5 DID NOT WANT AN HIV TEST DONE = 6 HUSBAND/FAMILY WOULD NOT LET ME GO = 7 USED TRADITIONAL BIRTH ATTENDANT = 8 POOR CLINICAL SERVICES =9 OTHER (SPECIFY)= 96 _____ DON'T KNOW = 98 REFUSED TO SAY = 99	334	C		
319		At what month in your pregnancy did you start attending the antenatal clinic?	1-3 MONTHS/1ST TRIMESTER = 1 4-6 MONTHS/2ND TRIMESTER = 2 7-9 MONTHS/3RD TRIMESTER = 3 DON'T REMEMBER/DON'T KNOW = 98 REFUSED TO SAY = 99	USE AIDS TO HELP DEFINE TIME	S		
320		What type of clinic did you go for antenatal care when you were pregnant with (NAME)?	PUBLIC CLINIC/HOSPITAL= 1 PRIVATE CLINIC/HOSPITAL = 2		S		
			FAITH BASED CLINIC/HOSPITAL=3 DON'T KNOW = 98 REFUSED TO SAY = 99				

321		During your visits to the antenatal care clinic when you were pregnant with (NAME), were you offered HIV testing and counselling?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY = 99	IF NO, DK, REFUSE →323	C		
322		Were you tested for HIV during any of your antenatal clinic visits when you were pregnant with (NAME)?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY = 99	IF YES →324	C		
323		What was the main reason you were not tested for HIV during antenatal care/maternity services with (NAME)? SELECT ONLY ONE OPTION PROBE FOR MAIN REASON	DID NOT WANT AN HIV TEST DONE/DON'T WANT TO KNOW MY STATUS = 1 DID NOT RECEIVE PERMISSION FROM SPOUSE/FAMILY = 2 AFRAID OTHERS WILL KNOW ABOUT TEST RESULTS = 3 DON'T NEED TEST/LOW RISK = 4 TEST NOT DONE AT CLINIC=5 HIV POSITIVE=6 OTHER (SPECIFY) = 96 _____ DON'T KNOW = 98 REFUSED = 99	IF HIV POSITIVE →327 ANYTHING ELSE →330			
324		Did you receive the results?	YES = 1 NO = 2 DON'T KNOW = 98	IF NO, DK, REFUSED →326	C-MODIFIED		

			REFUSED TO SAY = 99				

325		What were the results of the last HIV test you received during your pregnancy with (NAME)?	POSITIVE = 1 NEGATIVE = 2 UNKNOWN = 3 DON'T KNOW = 98 REFUSED TO SAY = 99		C-MODIFIED		
326		Where were you tested for HIV during your pregnancy with (NAME)? SELECT ALL THAT APPLY PROBE FOR SPECIFIC TYPE OF SERVICE	ANC CLINIC = 1 LABOUR ROOM=2 LABORATORY=3 VOLUNTARY COUNSELING AND TESTING (VCT) CENTER = 4 OTHER (SPECIFY) = 96 _____ DON'T KNOW = 98 REFUSED TO SAY = 99		S		
327		Did you get ARVs or HIV medications during your pregnancy to stop (NAME) from getting HIV?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY = 99	HIV POSITIVE ONLY FROM 315 OR 325 (OPTION 1) IF YES → 329	CC		

328		What was the main reason you did not get ARVs or HIV medicines for your own health while you were pregnant with (NAME)? SELECT ONLY ONE OPTION PROBE FOR MAIN REASON	HUSBAND/FAMILY DID NOT AGREE=1 HEALTH CARE PROVIDER DID NOT PRE-SCRIBE = 2 I FEEL HEALTHY/NOT SICK = 3 COST OF MEDICATIONS = 4 COST OF TRANSPORT = 5 RELIGIOUS REASONS = 6 TAKING TRADITIONAL MEDICATIONS = 7 I DIDN'T ACCEPT STATUS=8 OTHER (SPECIFY) =96 _____ DON'T KNOW = 98 REFUSED TO SAY = 99	330	C		
329		At what month in your pregnancy were you when you started taking ARVs or HIV medicine?	MONTHS 1-3/1ST TRIMESTER = 1 MONTHS 4-6/2ND TRIMESTER = 2 MONTHS 7-9/3RD TRIMESTER = 3 DON'T KNOW = 98 REFUSED = 99		S-MODIFIED		
SUBSECTION: SYPHILIS							
330		Were you offered a test for syphilis during your ANC visits for (NAME)?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY = 99	IF NO, DK, REFUSED 334	S		
331		Were you tested for syphilis during your ANC visits for (NAME)?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY = 99	IF NO, DK, REFUSED 334	S		

332		Did you test positive for syphilis during your pregnancy with (NAME)?	YES = 1 NO = 2 DID NOT GET RESULT = 3 DON'T KNOW = 98 REFUSED TO SAY = 99	IF NO, DK, REFUSED → 334	S		
333		Did you get treatment for syphilis during your pregnancy with (NAME)?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY = 99		S		
SUBSECTION: TIME IN LABOR							
334		Where did you give birth to (NAME)?	AT A HEALTH FACILITY = 1 AT HOME = 2 AT CHURCH=3 OTHER (SPECIFY) = 96 _____ REFUSED TO SAY = 99.	IF HOME, CHURCH, OTHER, REFUSE →341	C		
335		Were you offered an HIV test during labor?	YES = 1 NO = 2 ALREADY POSITIVE = 3	IF NO, DK, REFUSED →341			
			DON'T KNOW = 98 REFUSED TO SAY = 99	IF ALREADY POSITIVE → 338			

336		Did you test for HIV during labor?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY = 99	IF HIV POSITIVE FROM 315 OR 325 THEN SKIP TO → 339 IF NO, DON'T KNOW, REFUSED → 341			
337		What was the result of that test?	POSITIVE = 1 NEGATIVE = 2 UNKNOWN = 3 DID NOT RECEIVE RESULTS = 4 DON'T KNOW = 98 REFUSED TO SAY = 99	IF 2, 3, 4, 98,99 →341 IF HIV POSITIVE FROM 315 OR 325 THEN SKIP TO → 339			

338		During labor, were you offered ARVs to protect (NAME) from HIV?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY = 99	IF NO, DK, RE-FUSED→ 341 ASK ONLY IF HIV POSITIVE FROM 315 OR 325 OR 337			

339		During labor, did you take ARVs or HIV medications?	YES = 1 NO, DID NOT TAKE = 2 NO, NOT OFFERED = 3 DON'T KNOW = 98 REFUSED TO SAY = 99	IF NO, DK, RE-FUSED → 341 INCLUDE GRAPHIC OF ARVS. IF HIV POSITIVE FROM 315 OR 325 OR 337	C		
340		Did you continue to take the ARVs or HIV medications after labor?	YES = 1 NO= 2 DON'T KNOW = 98 REFUSED TO SAY = 99	IF HIV POSITIVE FROM 315 OR 325 OR 337	C		

SUBSECTION: AFTER BIRTH C					C		•
341		Did (NAME) take any ARVs or HIV medications to stop him/her from getting HIV infection? This would be before (NAME'S) first HIV test.	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY = 99	ONLY IF HIV POSITIVE (FROM 315 OR 325 OR 337) INSERT GRAPHIC OF ARVS.	C		
342		Did you ever breastfeed (NAME)?	YES = 1 NO = 2 REFUSED TO SAY = 99	IF NO, REFUSED → 346	C		

343		For how long did you breastfeed (NAME)? ONLY ONE OPTION MAY BE SELECTED. FOR EXAMPLE, ANSWER ONLY IN WEEKS OR IN MONTHS.	WEEKS ___ MONTHS ___ STILL BREASTFEEDING=3 DON'T KNOW = 98 REFUSED = 99		C		
344		Did you continue taking ARVs while you were breastfeeding (NAME)?	YES = 1 NO = 2 REFUSED TO SAY = 99	FOR HIV POSITIVE ONLY (FROM 315 OR 325 OR 337)	S		

345		Did you stop taking ARVs or HIV medicines once you stopped breastfeeding?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	ONLY IF HIV POSI-TIVE (FROM 315 OR 325 OR 337) AND ON TREAT-MENT (341)		Y	

346		FOR NON-BREASTFEEDING MOTHERS: After (NAME) was born, was he/she tested for HIV? FOR BREASTFEEDING MOTHERS: While you were breastfeeding, was (NAME) tested for HIV?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY = 99	FROM 342 IF NO, DK, REFUSED 352 ONLY IF HIV POS-TIVE (FROM 315 OR 325 OR 337)		Y	
347		How old was (NAME) when he/she first tested for HIV?	WEEKS ____ MONTHS ____ YEARS ____ DON'T KNOW = 98	ONLY IF HIV POSI-TIVE (FROM		Y	

			REFUSED = 99	315 OR 325 OR 337) CANNOT BE MORE THAN BREASTFEEDING MONTHS (343)			
348		What was the result of (NAME)'s first HIV test?	POSITIVE, (NAME) HAS HIV = 1 NEGATIVE, (NAME) DOES NOT HAVE HIV = 2 UNKNOWN = 3 DID NOT RECEIVE RESULTS = 4 DON'T KNOW = 98 REFUSED TO SAY = 99	ONLY IF HIV POSI-TIVE (FROM 315 OR 325 OR 337)		Y	

349		After you stopped breastfeeding, was (NAME) tested for HIV? SKIP IF NOT BREASTFED (FROM 342 OPTION 2)	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY = 99	ONLY IF HIV POSI-TIVE (FROM 315 OR 325 OR 337) IF NO, DK, REFUSED 351		Y	
350		What was the result of (NAME)'s HIV test?	POSITIVE, (NAME) HAS HIV = 1 NEGATIVE, (NAME) DOES NOT HAVE HIV = 2 UNKNOWN = 3 DID NOT RECEIVE RESULTS = 4 DON'T KNOW = 98 REFUSED TO SAY = 99	ONLY IF MOTHER-HIV POSI-TIVE (FROM 315 OR 325 OR 337)		Y	
351		INTERVIEWER READ: THANK YOU FOR THE INFORMATION REGARDING (NAME).					

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT	AKAIS ONLY	NOTES
352		Are you pregnant now?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY = 99	IF NO, DK, RE-FUSED 354	C		

353		How many months pregnant are you?	MONTHS _ _ DON'T KNOW = 98 REFUSED TO SAY = 99	SKIP TO 401	S		
FAMILY PLANNING							

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/S UPPLE-MENT	AKAIS ONLY	NOTES
354		Are you (your partner) currently doing something or using any method to delay or avoid getting pregnant?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY = 99	IF YES THEN 356	C		

355		Why are you not using a method to prevent pregnancy? PROBE FOR ALL RESPONSES RECORD ALL MENTIONED	NOT MARRIED/NO PARTNER = 1 NOT HAVING SEX = 2 INFREQUENT SEX = 3 MENOPAUSAL/ HYSTERECTOMY = 4 CAN'T GET PREGNANT = 5 NOT MENSTRUATED SINCE LAST BIRTH = 6 BREASTFEEDING = 7 UP TO GOD/FATALISTIC = 8 RESPONDENT OPPOSED = 9 HUSBAND/PARTNER OPPOSED = 10 RELIGION PROHIBITS= 11 KNOWS NO METHOD = 12 KNOWS NO SOURCE = 13 SIDE EFFECTS/HEALTH CONCERNS = 14 LACK OF ACCESS/TOO FAR = 15 COSTS TOO MUCH = 16 PREFERRED METHOD NOT AVAILABLE =17 NO METHOD AVAILABLE = 18 INCONVENIENT TO USE = 19 INTERFERES WITH BODY'S NORMAL PROCESSES = 20 WANTS MORE CHILDREN=21 OTHER (SPECIFY) = 96 _____	END MODULE	S		

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT	AKAIS ONLY	NOTES
			DON'T KNOW = 98 REFUSED = 99				
356		Which method are you (your partner) using? SELECT ALL THAT APPLY.	FEMALE STERILIZATION = 1 MALE STERILIZATION = 2 PILL = 3 IUD/ "COIL" = 4 INJECTIONS = 5 IMPLANT = 6 MALE CONDOM = 7 FEMALE CONDOM = 8 RHYTHM/NATURAL METHODS = 9 WITHDRAWAL= 10 NOT HAVING SEX/ABSTINENCE =11 OTHER (SPECIFY)= 96 _____ DON'T KNOW = 98 REFUSED TO SAY = 99		C		
357		Would you like to have a/another child?	YES, HAVE (A/ANOTHER) CHILD = 1 NO MORE/NONE = 2 NO, (PARTNER) CANNOT GET PREGNANT = 3 UNDECIDED/DON'T KNOW = 8 REFUSED = 9	IF NO MORE/NONE, DK, REFUSED →401	S		
NO.	VARNAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT	AKAIS ONLY	NOTES

358		How long would you like to wait before the birth of a/another child? Give your best estimate. PROBE FOR ESTIMATE	MONTHS ___ YEARS ___ OTHER (SPECIFY) = 96 _____ DON'T KNOW = 98 REFUSED = 99	END MODULE	S		

MODULE 4: CHILDREN

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT	AKAIS ONLY	NOTES
THE HOUSEHOLD SCHEDULE NOTED THAT [NAME OF PARTICIPANT] WILL FILL OUT THE CHILDREN'S MODULE FOR [NUMBER OF CHILDREN]. I AM GOING TO ASK YOU A NUMBER OF QUESTIONS ABOUT YOUR CHILD/CHILDREN REGARDING THEIR HEALTH AND WHERE THEY GET THEIR HEALTH SERVICES. WE WILL ASK YOU ABOUT THESE CHILDREN: LIST OF HOUSEHOLD MEMBERS FROM HOUSEHOLD SCHEDULE [LIST OF CHILDREN]							
401		DO NOT READ: CHECK HOUSEHOLD SCHEDULE TO GET NUMBER OF CHILDREN FOR THIS PARTICIPANT IF NONE RECORD '00'	NUMBER OF CHILDREN __ __	IF 00 ⍰ NEXT SECTION	C		
402		SCAN THE BARCODE OF THE CHILD FROM THE HOUSEHOLD LISTING	_____				PROGRAM TO DETERMINE HOW TO LINK TO HH SCHED-ULE
403		Interviewer: Begin with the youngest child What is your first youngest/second youngest/ and so on / oldest child's first name or nickname?	_____	START WITH THE YOUNG-EST CHILD			

404		How old was (NAME) at his/her last birthday? ENTER '0' IF CHILD IS LESS THAN ONE-YEAROLD AT PRESENT.	YEARS ___ DON'T KNOW = 98 REFUSED = 99	>0, DK, REFUSED 406 <0 THEN GO TO 405 AGE CANNOT BE GREATER THAN 14 YEARS.	C		
405		How old is [NAME] in months?	MONTHS ___ DON'T KNOW = 98 REFUSED = 99		C		

406		Is (NAME) a boy or girl?	BOY = 1 GIRL = 2 DON'T KNOW = 98 REFUSED = 99		C		
407		Is [NAME] enrolled in school?	YES = 1 NO, CURRENTLY NOT IN SCHOOL = 2 NO, TOO YOUNG TO BE IN SCHOOL = 3 DON'T KNOW = 98 REFUSED = 99	IF NO, TOO YOUNG, DK, REFUSED 412			

408		Was [NAME] enrolled in school during the previous school year?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED = 99	IF NO, DK, REFUSED 412			
409		What year was [NAME] in during the previous school year?	YEAR: ____ DON'T KNOW = 98 REFUSED = 99				
410		What is the highest level of school [NAME] has attended: primary or secondary?	PRIMARY = 1 SECONDARY = 2 DON'T KNOW = 98 REFUSED = 99	IF DK, REFUSED 412			

411		What year is [NAME] in now?	YEAR ____ DON'T KNOW = 98 REFUSED = 99				
412		Has (NAME) ever received a blood transfusion?	YES = 1 NO = 2 DON'T KNOW=98 REFUSED TO SAY=99			Y	

413		Is (NAME) circumcised?	YES = 1 NO = 2 DON'T KNOW=98 REFUSED TO SAY=99	IF NO, DK, RE-FUSED → 417 MALES ONLY. SHOW PICTURE OF CIR-CUM-CISED PENIS.	C		
414		How old was (NAME) when he was circumcised? ONLY ONE OPTION MAY BE SELECTED. FOR EXAMPLE, ANSWER ONLY IN YEARS OR IN MONTHS.	CODE '00' IF LESS THAN ONE MONTH. MONTHS ___ (LESS THAN 12 MONTHS) YEARS ___ DON'T KNOW = 98 REFUSED = 99	MALES ONLY.	S		
415		Where was (NAME) circumcised?	AT HOME = 1 IN A PUBLIC CLINIC OR HEALTH FACILITY = 2 PRIVATE CLINIC OR HELATH FACILITY = 3 OTHER (SPECIFY) = 96 _____ DON'T KNOW = 98 REFUSED TO SAY=99	MALES ONLY		Y	

416		Who circumcised (NAME)?	TRADITIONAL PRACTITIONER/CIRCUMCISER/LOCAL BABA = 1 CLINICIAN=2 OTHER (SPECIFY) = 96 _____ DON'T KNOW = 98 REFUSED TO SAY=99	MALES ONLY SKIP TO 418	C		
417		Are you planning to circumcise (NAME) in the future?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY=99	MALES ONLY	S		
418		Has (NAME) ever been tested for HIV?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY=99	IF NO, DK, REFUSED →419 IF YES – 420	C		

419		Why has [NAME] never been tested for HIV? SELECT ALL THAT APPLY. PROBE FOR ALL ANSWERS	DON'T KNOW WHERE TO TEST = 1 TEST COSTS TOO MUCH = 2 TRANSPORT COSTS TOO MUCH = 3 TOO FAR AWAY = 4 AFRAID OTHERS WILL KNOW ABOUT TEST RESULTS = 5 DON'T NEED TEST/LOW RISK = 6 DID NOT RECEIVE PERMISSION FROM SPOUSE/FAMILY = 7 AFRAID SPOUSE/PARTNER/FAMILY WILL KNOW RESULTS = 8 DON'T WANT TO KNOW CHILD HAS HIV = 9 CANNOT GET TREATMENT FOR HIV = 10 TEST KITS NOT AVAILABLE = 11 RELIGIOUS REASONS = 12 OTHER = 13 SPECIFY: _____ DON'T KNOW = 98 REFUSED = 99	443			
420		How many times has (NAME) been tested for HIV?	NUMBER OF TIMES ____ DON'T KNOW = 98 REFUSED TO SAY= 99	CAN'T BE ZERO		Y	
421		Where were the HIV test(s) done? SELECT ALL THAT APPLY.	CHILD WELLFARE CLINIC-1 IN-PATIENT WARD = 2 OUTPATIENT CLINIC =3 TB CLINIC = 4 POST-NATAL CLINIC=5		S		

			OTHER (SPECIFY) = 96 _____ DON'T KNOW = 98 REFUSED TO SAY=99				

422		What month and year was [NAME]'s last HIV test done? IF LESS THAN ONE MONTH, CODE '00".	MONTH __ __ DON'T KNOW MONTH = 98 REFUSED MONTH = 99 YEAR __ __ __ __ DON'T KNOW YEAR = 98 REFUSED YEAR = 99	DATE RESTRAINTS	C		
423		What was (NAME)'s <u>last</u> HIV test result?	POSITIVE = 1 NEGATIVE = 2 INDETERMINATE = 3 DID NOT RECEIVE RESULTS = 4 DON'T KNOW = 98 REFUSED TO SAY=99	IF NEG, INDET, DID NOT RECEIVE, DK, REFUSED 443	C		
424		What was the month and year of (NAME)'s first HIV positive test result? Please give your best guess. This will be the very first HIV positive test result that you have received. PROBE TO VERIFY DATE.	MONTH __ __ DON'T KNOW MONTH = 98 REFUSED MONTH = 99 YEAR __ __ __ __ DON'T KNOW YEAR = 98 REFUSED YEAR = 99		C		

425		Has (NAME) ever received HIV care from a health care provider?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY=99	IF YES 427	C		

426		What is the main reason why (NAME) has never seen a health care provider for HIV care? SELECT ONLY ONE RESPONSE	FACILITY IS TOO FAR AWAY = 1 I DON'T KNOW WHERE TO GET HIV CARE = 2 COST OF CARE = 3 COST OF TRANSPORT = 4 I DON'T THINK HE/SHE NEEDS IT, HE/SHE IS NOT SICK = 5 I FEAR PEOPLE WILL KNOW THAT HE/SHE HAS HIV IF I TAKE HIM/HER TO A CLINIC = 6 HE/SHE IS TAKING TRADITIONAL MEDICINE = 7 DON'T KNOW = 98 REFUSED TO SAY= 99	443	C		
427		After learning of (NAME)'s HIV diagnosis, what month and year did (NAME) first see a health care provider for HIV care?	MONTH _____ DON'T KNOW MONTH = 98 REFUSED MONTH= 99 YEAR _____ DON'T KNOW YEAR =9998 REFUSED = 9999				
428		What month and year did (NAME) last see a health care provider for HIV care?	MONTH _____ DON'T KNOW MONTH = 98 REFUSED MONTH= 99 YEAR _____ DON'T KNOW YEAR =9998 REFUSED = 9999		C		

429		What is the <u>main</u> reason for (NAME) not seeing a health care provider for HIV medical care in the past 6 months? SELECT ONLY ONE RESPONSE PROBE FOR THE MAIN REASON	FACILITY IS TOO FAR AWAY = 1 COST OF CARE = 2 COST OF TRANSPORT =3 I DON'T THINK HE/SHE NEEDS IT, HE/SHE IS NOT SICK = 4 I FEAR PEOPLE WILL KNOW THAT HE/SHE HAS HIV IF I TAKE HIM/HER TO A CLINIC = 5 RELIGIOUS REASONS = 6 HE/SHE IS TAKING TRADITIONAL MEDICINE = 7 OTHER (SPECIFY) = 96 _____ DON'T KNOW = 98 REFUSED = 99		C		
430		Has (NAME) ever had a CD4 count test? The CD4 count tells you how sick you are with HIV and if you need take ARVs or HIV medications.	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY= 99	IF NO, DK, REFUSED → 432	C		
431		What month and year did (NAME)'s health care provider last test his/her CD4 count?	MONTH _____ DON'T KNOW MONTH = 98 REFUSED MONTH= 99 YEAR _____ DON'T KNOW YEAR =9998 REFUSED = 9999		C		
432		Has (NAME) ever taken ARVs or HIV medications, to treat his/her HIV infection?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY= 99	IF YES → 434 USE GRAPHIC	C		

433		What is the main reason (NAME) has never taken ARVs or HIV medications? SELECT ONLY ONE RESPONSE PROBE FOR MAIN REASON	NOT ELIGIBLE FOR TREATMENT=1 HEALTH CARE PROVIDER DID NOT PRESCRIBE = 2 HIV MEDICINES NOT AVAILABLE = 3 I DON'T THINK NEEDS IT, HE/SHE IS NOT SICK = 4 COST OF MEDICATIONS = 5 COST OF TRANSPORT = 6 RELIGIOUS REASONS = 7 TAKING TRADITIONAL MEDICATIONS = 8 OTHER (SPECIFY) = 96 _____ DON'T KNOW = 98 REFUSED TO SAY= 99	438	C		
434		When did (NAME) first start taking ARVs or HIV medications?	MONTH _____ DON'T KNOW MONTH = 98 REFUSED MONTH= 99 YEAR _____ DON'T KNOW YEAR =9998 REFUSED = 9999		C		
435		Is (NAME) currently taking ARVs or HIV medications?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY= 99	IF YES 437	C		
436		What is the main reason why (NAME) is not taking ARVs or HIV medications?	I HAVE TROUBLE GIVING HIM/HER A TABLET EVERYDAY = 1 HAD SIDE EFFECTS/RASH = 2 FACILITY/PHARMACY TOO FAR AWAY TO GET MEDICATION REGULARLY = 3	438	C		

			COST OF MEDICATIONS = 4 COST OF TRANSPORT = 5 HE/SHE IS HEALTHY; HE/SHE IS NOT SICK = 6 FACILITY WAS OUT OF STOCK = 7 RELIGIOUS REASONS=8 HE/SHE IS TAKING TRADITIONAL MEDICATIONS = 9 OTHER (SPECIFY) = 96 _____ DON'T KNOW = 98 REFUSED = 99				
437		People sometimes forget to take their ARVs. In the past 30 days, how many days has (NAME) missed taking any ARV pills (HIV medications)?	NUMBER OF DAYS ___ ___ DON'T KNOW = 98 REFUSED = 99		C		
438		Has (NAME) ever had a viral load test? This is a test that measures how much HIV is in your blood.	YES= 1 NO= 2 DON'T KNOW = 98 REFUSED TO SAY= 99	If NO, DK, RE-FUSED →441	S		
439		What month and year was (NAME) <u>last</u> viral load test?	MONTH _____ DON'T KNOW MONTH = 98 REFUSED MONTH= 99 YEAR _____ DON'T KNOW YEAR =9998 REFUSED = 9999		S		

440		Were you told the result of (NAME)'s viral load test?	YES= 1 NO= 2 DON'T KNOW = 98 REFUSED TO SAY= 99		S		

441		Is (NAME) currently taking Septrin or Cotrimoxazole?	YES = 1 NO = 2 I DON'T KNOW WHAT IT IS = 3 DON'T KNOW = 98 REFUSED TO SAY= 99	IF YES (1), IDK (3), DK (98), REFUSED (99) 443 SHOW GRAPHIC OF SEPTRIN OR COTRIMOXA-ZOLE.	C		
442		Can you tell me the <u>main</u> reason why (NAME) is not <u>currently</u> taking Septrin or cotrim daily? SELECT ONLY ONE	NOT PRESCRIBED = 1 I HAVE TROUBLE GIVING HIM/HER A TABLET EVERYDAY = 2 HE/SHE HAD SIDE EFFECTS/RASH = 3 FACILITY/PHARMACY TOO FAR AWAY TO GET SEPTRIN OR COTROMOXIAZOLE REGULARLY = 4 HE/SHE DOES NOT NEED IT, HE/SHE IS NOT SICK = 5 PHARMACY/ FACILITY WAS OUT OF STOCK = 6 COST OF MEDICATIONS = 7		S		
			COST OF TRANSPORT = 8 DOCTOR SAID NO LONGER NEEDED = 9 OTHER (SPECIFY) = 96 _____ DON'T KNOW = 98 REFUSED TO SAY = 99				

443		Has [NAME] ever visited a clinic for tuberculosis (TB) for diagnosis or treatment?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED SKIP TO END OF MODULE	C		
444		Have you ever been told by a health care provider that [NAME] had TB?	YES = 1 NO=2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED SKIP TO END OF MODULE	C		
445		Was [NAME] ever treated for TB?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED SKIP TO END OF MODULE	C		
446		Is [NAME] currently on treatment for TB?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	NO, DK, REFUSED 448	C		
447		The last time [NAME] was treated for TB, did [NAME] complete at least 6 months of treatment?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9		C		
448		Did you ever receive a basic care kit that may have contained items for your HIV care? These items may have included a	YES = 1 NO=2 DON'T KNOW = 98 REFUSED TO SAY= 99		S		

		bucket, a mosquito net, water guard, a filter cloth, and educational materials.					
449		Thank you for the information about [NAME]. DOES THE RESPONDENT HAVE ANOTHER CHILD AGED 0-14 YEARS?	YES = 1 NO = 2	YES→RETURN BEGINNING OF MODULE	C		
INTERVIEWER: IF PARENT/GUARDIAN HAS ANOTHER CHILD UNDER 14 YEARS BESIDES (NAME), GO TO TOP, 401, AND ASK ABOUT NEXT YOUNGEST CHILD. IF NO OTHER CHILDREN, THEN CONTINUE TO NEXT SECTION. ASK EACH QUESTION FOR ALL CHILDERN AGE 0 MONTHS- 14 YEARS							

MODULE 5: SEXUAL ACTIVITY

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT	AKAIS ONLY	NOTES
Now I would like to ask you some questions about your sexual activity in order to gain a better understanding of some important life issues. Let me assure you again that your answers are completely confidential and will not be told to anyone. If we should come to any question that you don't want to answer, just let me know and we will go to the next question.							

501		Have you ever had sex?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY = 99	ONLY IF SINGLE, NEVER PREGNANT OR NEVER HAD CHILDREN IF NO → 601		Y	
502		Have you ever had vaginal sex? This is where a man puts his penis into a woman's vagina.	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY = 99	IF NO → 505		Y	TRACKS TO CORE 601

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT	AKAIS ONLY	NOTES
503		At what age did you <u>first</u> have vaginal sex?	AGE IN YEARS _ _ DON'T KNOW = 98 REFUSED TO SAY = 99			Y	TRACKS TO CORE 601
504		Did you use a condom the first time you had vaginal sex?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY = 99		S		
505		Some men and women like to have anal sex. This is where a man puts his penis in someone's anus. Have you ever practiced this?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY = 99	IF NO & 502=1 CHECK 501 AND PROBE IF EVER HAD SEX. IF NO→510	S		

506		At what age did you first have anal sex?	AGE IN YEARS __ __ DON'T KNOW = 98 REFUSED TO SAY = 99		S		

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS /FILTERS	CORE/ SUPPLEMENT	AKAIS ONLY	NOTES
507		The first time you had anal sex, was a condom used?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY = 99		S		
508		Have you had anal sex in the last 12 months?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY = 99			Y	
509		How many different people have you had anal sex in the last 12 months? IF NON-NUMERIC ANSWER: PROBE TO GET AN ESTIMATE. IF NUMBER OF PARTNERS IS GREATER THAN 95, WRITE '95'.	NUMBER OF PARTNERS IN LAST 12 MONTHS __ __ DON'T KNOW = 98 REFUSED TO SAY= 99			Y	

510		How many <u>different</u> people have you had sex with in your lifetime? IF NON-NUMERIC ANSWER: PROBE TO GET AN ESTIMATE. IF NUMBER OF PARTNERS IS GREATER THAN 100, WRITE '100'.	NUMBER OF PARTNERS IN LIFETIME _ _ _ DON'T KNOW = 998 REFUSED TO SAY= 999		S		

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT	AKAIS ONLY	NOTES
IF LESS THAN 3 PARTNERS: Now I would like to ask you some questions about the partners you have had sex with in the last 12 months. IF 3 OR GREATER: Now I would like to ask you some questions about the LAST 3 partners you have had sex with in the past 12 months. TO ALL: Let me assure you again that your answers are completely confidential and will not be told to anyone. REPEAT FOR THE 3 MOST RECENT PARTNERS.							
511		I would like to ask you for initials of your last partners in last 12 months so I can keep track. You don't have to give me exact initials. First give me the initials of the last person you had sex with in the last 12 months.	INITIALS ___ ___				

512		Does (INITIALS) live in this household?	YES = 1 NO = 2 REFUSED TO SAY = 99	If NO ⍰514			
513		SCAN THE BARCODE FROM THE HOUSEHOLD SCHEDULE OF (INITIALS) IF THE PERSON IS NOT LISTED IN THE HOUSEHOLD, RECORD '00'.					

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT	AKAIS ONLY	NOTES
514		What is your relationship with (INITIALS)?	HUSBAND/WIFE = 1 LIVE-IN PARTNER = 2 PARTNER, NOT LIVING WITH RESPONDENT = 3 FRIEND/ACQUAINTANCE = 4 SEX WORKER = 5 SEX WORKER CLIENT =6 OTHER = 96 DON'T KNOW = 98 REFUSED TO SAY = 99		C		
515		What is the sex of this person?	MALE = 1 FEMALE = 2 DON'T KNOW = 98 REFUSED TO SAY = 99		C		

516		How long has it been since you first had sex with (INITIALS)? IF LESS THAN ONE WEEK RECORD IN DAYS, IF LESS THAN ONE MONTH, RECORD IN WEEKS, OTHERWISE RECORD IN MONTHS.	DAYS:__ __ WEEKS:__ __ MONTHS:__ __ YEARS:__ __ DON'T KNOW = 98 REFUSED TO SAY = 99		S		
517		How old is this person? Please give your best guess.	YEARS ___ DON'T KNOW =98 REFUSED TO SAY = 99		C		

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT	AKAIS ONLY	NOTES
518		The last time you had sex with (INITIALS), did you have oral sex, vaginal sex, or anal sex? TICK ALL THAT APPLY PROBE FOR ALL RESPONSES	ORAL=1 VAGINAL = 2 ANAL = 3 DON'T KNOW =98 REFUSED TO SAY = 99		S		
519		Did you use a condom the last time you had sex with (INITIALS)?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY = 99		C		

520		In the last 12 months, did you have vaginal sex with (INITIALS) without using a condom?	YES = 1 NO = 2 NO VAGINAL SEX IN THE LAST 12 MONTHS = 3 DON'T KNOW = 98 REFUSED TO SAY = 99	SKIP IF NEVER HAD VAGINAL SEX (502) SKIP IF REPONDENT IS MALE AND PARTNER IS MALE		Y	

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT	AKAIS ONLY	NOTES
521		In the last 12 months, did you have anal sex with (INITIALS) without using a condom?	YES = 1 NO = 2 NO ANAL SEX IN THE LAST 12 MONTHS = 3 DON'T KNOW = 98 REFUSED TO SAY = 99	SKIP IF NEVER HAD ANAL SEX		Y	
522		In the last 12 months, did you ever use a condom when you had sex with (INITIALS)?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY = 99	IF NO, DK, REFUSED ⍰524	S		
523		In the last 12 months, when you had sex with (INITIALS), did the condom you were using ever break, leak or slip off during sex?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY = 99		S		

524		Did you have sex with (INITIALS) because they provided you with material support? Material suppo means helping to pay for things, or givin you gifts or mo or opportunity	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY = 99	SKIP IF SPOUSE IF NO, DK, REFUSED 526	C		

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT	AKAIS ONLY	NOTES
525		In the last 12 months, what did you receive when you had sex with (INITIALS)? SELECT ALL THAT APPLY. PROBE FOR ALL RESPONSES	MONEY = 1 FOOD = 2 GOOD GRADES = 3 SCHOOL FEES = 4 EMPLOYMENT = 5 GIFTS/FAVORS = 6 TRANSPORT = 7 SHELTER/RENT = 8 PROTECTION = 9 OTHER (SPECIFY) = 96 _____ DON'T KNOW = 98 REFUSED TO SAY = 99		C		
526		Do you expect to have sex with (INITIALS) again?	YES =1 NO =2 DON'T KNOW = 98 REFUSED TO SAY = 99		C		
527		Does (INITIALS) know your HIV status? HIV status could mean you are HIV negative or HIV positive.	YES =1 NO =2 DON'T KNOW = 98 REFUSED TO SAY = 99		C		

NO.	VARNAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT	AKAIS ONLY	NOTES
528		Do you know (INITIALS) HIV Status? HIV status could mean you are HIV negative or HIV positive	YES =1 NO =2 REFUSED TO SAY = 99	IF NO, REFUSED ⍰530		Y	
529		What is the HIV status of (INITIALS)? READ REPSONSE ALOUD	I THINK (INITIALS) IS POSITIVE = 1 (INTIALS) TOLD ME HE/SHE IS POSITIVE = 2 (INITIALS) IS POSITIVE, TESTED TOGETHER = 3 I THINK (INITIALS) IS NEGATIVE = 4 (INITIALS) TOLD ME HE/SHE IS NEGATIVE = 5 (INITIALS) IS NEGATIVE, TESTED TOGETHER=6 DON'T KNOW STATUS = 98 REFUSED TO SAY= 99		C		
530		DOES THE RESPONDENT HAVE ANOTHER PARTNER IN THE LAST 12 MONTHS? I will now ask you about the person you have had sex with prior to (INITALS).	YES=1 NO=1	IF YES, REPEAT MODULE	C		

MODULE 6: HIV/AIDS KNOWLEDGE AND ATTITUDES

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT/ OPTIONAL	AKAIS ONLY	NOTES

601		Can the risk of HIV transmission be reduced by having sex with only one uninfected partner who has no other partners?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO ANSWER=99		O		
602		Can people reduce their risk of getting HIV by using a condom every time they have sex?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY=99		O		
603		Can people get HIV from mosquito bites?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY=99		O		
604		Can people get HIV by sharing food with a person who has HIV?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY=99		O		

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT/ OPTIONAL	AKAIS ONLY	NOTES
605		Can people get HIV because of witchcraft or other supernatural means?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY=99			Y	
606		Can a healthy-looking person have HIV?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY=99		O		

607		Would you buy fresh vegetables from a shopkeeper or vendor if you knew that this person had HIV?	YES= 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY=99				
608		Do you think children living with HIV should be allowed to attend school with children who do not have HIV?	YES = 1 NO = 2 DON'T KNOW/NOT SURE/DEPENDS = 98 REFUSED = 99				
609		Do you think people hesitate to take an HIV test because they are afraid of how other people will react if the test result is positive for HIV?	YES = 1 NO = 2 DON'T KNOW/NOT SURE/DEPENDS = 98 REFUSED = 99				
NO.	VARNAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT/ OPTIONAL	AKAIS ONLY	NOTES
610		Do people talk badly about people who are living with HIV, or who are thought to be living with HIV?	YES = 1 NO = 2 DON'T KNOW/NOT SURE/DEPENDS = 98 REFUSED = 99				
611		Do people living with HIV, or thought to be living with HIV, lose the respect of other people?	YES = 1 NO = 2 DON'T KNOW/NOT SURE/DEPENDS = 98 REFUSED = 99				
612		Do you fear that you could get HIV if you come into contact with the saliva of a person living with HIV?	YES = 1 NO =2 ALREADY HAS HIV = 3 DON'T KNOW/NOT SURE/DEPENDS = 98 REFUSED = 99				

613		Would you be ashamed if someone in your family had HIV?	YES= 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY=99				

MODULE 7: HIV/AIDS TESTING

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT/ OPTIONAL	AKAIS ONLY	NOTES
701		Has a health care worker or outreach worker ever talked to you about HIV?	YES= 1 NO = 2 DON'T KNOW = 98 REFUSE TO SAY=99	IF NO, DK, REFUSED ⍰703	S		
702		When was the last time a health care worker or outreach worker talked to you about HIV?	IN THE LAST 30 DAYS =1 IN THE LAST 3 MONTHS= 2 IN THE LAST YEAR =3 LONGER THAN A YEAR AGO =4 DON'T KNOW = 98 REFUSE TO SAY=99				
703		Have you <u>ever</u> been tested for HIV?	YES = 1 NO = 2 DON'T' KNOW =98 REFUSE TO SAY=99	IF YES⍰705		C	
704		Why have you never been tested for HIV? PROBE: Any other reason?	NO KNOWLEDGE ABOUT HIV TEST =1 DON'T KNOW WHERE TO GET ONE = 2 TEST COSTS TOO MUCH = 3 TRANSPORT TO VCT SITE TOO	⍰715	C		

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT/ OPTIONAL	AKAIS ONLY	NOTES
		RECORD ALL MENTIONED.	MUCH = 4 VCT/HTC SITE TOO FAR AWAY =5 AFRAID OTHERS WILL KNOW ABOUT TEST/TEST RESULTS = 6 DON'T NEED TEST/LOW RISK = 7 AFRAID TO KNOW IF I HAVE HIV =8 CAN'T GET TREATMENT IF HAVE HIV =9 NEVER BEEN OFFERED A TEST = 10 DID NOT RECEIVED PREMISSION FROM SPOUSE/FAMILY=11 OTHER (SPECIFY) = 96 _____ DON'T KNOW = 98 REFUSE TO SAY=99				
705		Why did you test for HIV? PROBE FOR ALL POSSIBLE ANSWERS RECORD ALL MENTIONED	HEALTH CARE OR OUTREACH OFFERED TEST=1 TESTED DURING ANTENATAL CLINIC VISIT=2 I JUST WANTED TO KNOW=3 FELT AT RISK OR SICK=4 GOT A NEW PARTNER=5 OTHER (SPECIFY) = 96 _____ DON'T KNOW =98 REFUSE TO SAY=99		S		

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT/ OPTIONAL	AKAIS ONLY	NOTES

706		When was your last HIV test?	LESS THAN 3 MONTHS AGO =1 3-5 MONTHS AGO = 2 6-11 MONTHS AGO = 3 1-2 YEARS AGO = 4 MORE THAN 2 YEARS AGO = 5 DON'T KNOW= 98 REFUSED TO SAY=99		C-MODIFIED		
707		Where was the last test done?	VCT FACILITY = 1 MOBILE VCT =2 AT HOME = 3 HEALTH CLINIC / FACIITY =4 HOSPITAL OUT PATIENT CLINIC =5 TB CLINIC = 6 STI CLINIC = 7 HOSPITAL INPATIENT WARDS = 8 BLOOD DONATING CENTER = 9 FAMILY PLANNING CLINIC = 10 ANTENATAL CLINIC=11 OTHER (SPECIFY) = 96 _____ DON'T KNOW=98 REFUSED TO SAY=99		C		

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT/ OPTIONAL	AKAIS ONLY	NOTES
708		What was the result of your last HIV test?	POSITIVE=1 NEGATIVE=2 UNCERTAIN/INDETERMINATE=3 DID NOT RECEIVE THE RESULT=4 DON'T KNOW=98 REFUSED TO SAY=99	If NEG, UNCERT, IND, NO RESULT, DK, REF→715	C		

709		What was the month and year of your first HIV positive test result? Please give your best guess. This will be the very first HIV positive test result that you have received. PROBE TO VERIFY DATE.	MONTH __ __ DON'T KNOW MONTH = 8 REFUSED MONTH = 9 YEAR __ __ __ __ DON'T KNOW YEAR = 98 REFUSED YEAR = 99		C		
710		Who have you told that you are HIV positive? TICK ALL THAT APPLY. PROBE FOR ALL ANSWERS	NO ONE =1 SPOUSE/SEX PARTNER =2 DOCTOR =3 FRIEND =4 FAMILY MEMBER= 5 OTHER (SPECIFY) = 96 _____ DON'T KNOW=98 REFUSED TO SAY=99		C		

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS /FILTERS	CORE/ SUPPLEMENT/ OPTIONAL	AKAIS ONLY	NOTES
711		Have you visited a health facility to see a doctor or health provider in the last 12 months?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY=99	IF NO 713	S		
712		During any of your visits to the health facility in the last 12 months, did a health provider offer you an HIV test?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED = 99		S		

713		Have you ever tested yourself for HIV in private using a self-test kit? With a self-test kit you can test yourself for HIV at home. There are instructions on how to interpret the results.	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY=99		S		
714		In your lifetime, how many total times have you been tested for HIV? PROBE FOR BEST ESTIMATE	NUMBER OF TIMES TESTED FOR HIV — — DON'T KNOW = 98 REFUSED TO SAY=99		S		
715		What do you think are your chances of getting HIV? READ OUT ALL RESPONSES	NO RISK AT ALL = 1 SMALL = 2 MODERATE = 3 GREAT = 4	IF MODERATE/ GREAT 717		Y	
NO.	VARNAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/SUPPLEMENT/OPTIONAL	AKAIS ONLY	NOTES
			I ALREADY HAVE HIV = 5 DON'T KNOW = 98 REFUSED TO SAY=99				

716		Why do you think you have no risk/a small chance of getting HIV? PROBE FOR ALL POSSIBLE REASONS RECORD ALL MENTIONED	NEVER HAD SEX = 1 NOT HAVING SEX ANYMORE = 2 USES CONDOMS = 3 HAS ONLY ONE PARTNER = 4 LIMITS NUMBER OF PARTNERS = 5 PARTNER HAS NO OTHER PARTNER = 6 OTHER (SPECIFY) = 96 _____ DON'T KNOW = 98 REFUSED TO SAY=99	SKIP TO 801		Y	
717		Why do you think you have moderate/great risk of getting HIV? PROBE FOR ALL POSSIBLE REASONS RECORD ALL MENTIONED	DOES NOT USE CONDOMS.= 1 HAS MORE THAN ONE PARTNER=2 PARTNER HAS OTHER PARTNERS =3 HOMOSEXUAL CONTACTS=4 HAD BLOOD TRANSFUSIONS/ INJECTIONS=5 OTHER (SPECIFY) = 96 _____ DON'T KNOW = 98 REFUSED TO SAY=99			Y	

MODULE 8: HIV STATUS, CARE AND TREATMENT

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT/ OPTIONAL	AKAIS ONLY	NOTES

Now I'm going to ask you more about your experience with HIV support, care, and treatment.				SKIP IF NOT HIV POSITIVE (FROM 708) TO 901			
801		After learning of your HIV diagnosis, have you ever received HIV medical care from a health care provider?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY = 99	IF YES → 803		C	
802		What is the main reason why you have never seen a health care provider for HIV medical care? SELECT ONLY ONE	THE FACILITY IS TOO FAR AWAY = 1 I DON'T KNOW WHERE TO GET HIV MEDICAL CARE = 2 COST OF CARE = 3 COST OF TRANSPORT = 4 I FEEL HEALTHY/NOT SICK = 5 I FEAR PEOPLE WILL KNOW THAT I HAVE HIV IF I GO TO A CLINIC = 6 I'M TAKING TRADITIONAL MEDICINE= 7 RELIGIOUS REASONS = 8 OTHER (SPECIFY) = 96 _____ DON'T KNOW = 98 REFUSED TO SAY = 99	→ 901		C	

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS /FILTERS	CORE/ SUPPLEMENT/ OPTIONAL	AKAIS ONLY	NOTES

803		After learning your HIV diagnosis, what month and year did you <u>first</u> see a health care provider for HIV medical care?	MONTH __ __ DON'T KNOW =98 REFUSE TO SAY=99 YEAR __ __ __ __ DON'T KNOW=9998 REFUSED TO SAY=9999		C		
804		How many months or years has it been since you <u>last</u> saw a health care provider for HIV medical care?	MONTH __ __ DON'T KNOW MONTH = 98 REFUSED TO SAY= 99 YEAR __ __ DON'T KNOW YEAR =9998 REFUSED TO SAY = 9999	IF LAST MEDICAL VISIT ≥2 MONTHS,→806.	C		
805		Following your last appointment, what is the date of your next scheduled visit?	MONTH __ __ DON'T KNOW MONTH = 98 REFUSED TO SAY= 99 YEAR __ __ __ __ DON'T KNOW YEAR =9998 REFUSED TO SAY = 9999			Y	

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT/ OPTIONAL	AKAIS ONLY	NOTES

806		What is the <u>main</u> reason for not seeing a health care provider for HIV medical care since your last visit? SELECT ONLY ONE	THE FACILITY IS TOO FAR AWAY = 1 I DON'T KNOW WHERE TO GET HIV MEDICAL CARE = 2 COST OF CARE = 3 COST OF TRANSPORT = 4 I FEEL HEALTHY/NOT SICK = 5 I FEAR PEOPLE WILL KNOW THAT I HAVE HIV IF I GO TO A CLINIC = 6 I'M TAKING TRADITIONAL MEDICINE= 7 RELIGIOUS REASONS = 8 OTHER (SPECIFY) = 96 _____ DON'T KNOW = 98 REFUSED TO SAY= 99		C		
807		Approximately how long does it take you to travel from your home (or workplace) to see a health care provider?	LESS THAN ONE HOUR = 1 ONE TO TWO HOURS = 2 MORE THAN TWO HOURS = 3 DON'T KNOW = 98 REFUSED TO SAY= 99		S		

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT /OPTIONAL	AKAIS ONLY	NOTES
808		Approximately how much does it cost to travel from your home (or workplace) to the clinic?	COST _____ DON'T KNOW = 98 REFUSED = 99	USE LOCAL CUR-RENCY (i.e. Nigerian Naira).	S		

809		Have you ever had a CD4 count test? The CD4 count tells you how sick you are with HIV and if you need to take ARVs or other HIV medications.	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED = 99	NO, DK, REFUSED → 811 NO, DK, REFUSED & NEVER IN HIV CARE (801) → SKIP TO END OF MODULE			
810		What month and year were you last tested for your CD4 count?	MONTH __ __ DON'T KNOW MONTH = 98 REFUSED MONTH = 99 YEAR __ __ __ __ DON'T KNOW YEAR = 98 REFUSED YEAR = 99	SKIP TO END OF MODULE IF NEVER IN HIV CARE (801).			
811		Have you <u>ever</u> taken ARVs, that is, antiretroviral medications or HIV medications, to treat HIV infection?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY = 99	IF YES → 813	C		

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT / OPTIONAL	AKAIS ONLY	NOTES

812		What is the main reason you have never taken ARVs or HIV medications? SELECT ONLY ONE	NOT ELIGIBLE FOR TREATMENT=1 HEALTH CARE PROVIDER DID NOT PRESCRIBE = 2 HIV MEDICINES NOT AVAILABLE = 3 I FEEL HEALTHY/NOT SICK = 4 COST OF MEDICATIONS = 5 COST OF TRANSPORT = 6 RELIGIOUS REASONS = 7 TAKING TRADITIONAL MEDICATIONS = 8 NOT ATTENDING HIV CLINIC = 9 OTHER (SPECIFY) = 96 _____ DON'T KNOW = 98 REFUSED TO SAY=99	819	C		
813		When did you first start taking ARVs or HIV medications?	MONTH __ __ DON'T KNOW =98 REFUSE TO SAY=99 YEAR __ __ __ __ DON'T KNOW=9998 REFUSED TO SAY=9999		C		

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT/ OPTIONAL	AKAIS ONLY	NOTES

814		Are you currently taking ARVs, that is, antiretroviral medications or HIV medications?	YES = 1 NO=2 DON'T KNOW = 98 REFUSED TO SAY = 99	IF YES → 816	C		
815		Can you tell me the main reason why you are not taking ARVs, antiretroviral medications or HIV medications? PROBE FOR THE MAIN REASON SELECT ONLY ONE	I HAVE TROUBLE TAKING A TABLET EVERYDAY =1 I HAD SIDE EFFECTS =2 FACILITY TOO FAR AWAY FOR ME TO GET MEDICINE REGULARLY = 3 COST OF MEDICATIONS =4 COST OF TRANSPORT = 5 I FEEL HEALTHY/NOT SICK =6 FACILITY WAS OUT OF STOCK =7 RELIGIOUS REASONS =8 TAKING TRADITIONAL MEDICATIONS = 9 OTHER (SPECIFY) = 96 _____ DON'T KNOW = 98 REFUSED TO SAY=99	→ 819	C		
816		People sometimes forget to take their ARVs. In the past 30 days, how many days have you missed	DAYS _____ DON'T KNOW = 98 REFUSED TO SAY = 99		C		

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT/ OPTIONAL	AKAIS ONLY	NOTES
		taking any of your ARV pills (HIV medications)?					
817		In the past 7 days, how many days have you missed taking any of your ARV pills (HIV medications)?	DAYS _____ DON'T KNOW = 98 REFUSED TO SAY =9 9			Y	
818		Did you take all your ARV pills yesterday?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY =99			Y	
819		Did you ever have a viral load test? This is a test that measures how much HIV is in your blood.	YES= 1 NO= 2 DON'T KNOW =98 REFUSED TO SAY =99	IF NO, DK, REFUSED 822	S		
820		When did you last have a viral load test?	MONTH __ __ DON'T KNOW =98 REFUSE TO SAY=99 YEAR __ __ __ __ DON'T KNOW=9998 REFUSED TO SAY=9999		S		

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT/ OPTIONAL	AKAIS ONLY	NOTES

821		Were you told the result of your viral load test?	YES= 1 NO= 2 DON'T KNOW = 98 REFUSED TO SAY = 99		S		
822		Are you <u>currently</u> taking Septrin or cotrim?	YES = 1 NO=2 DON'T KNOW = 98 REFUSED TO SAY = 99	IF YES, DK, REFUSED → 824 SHOW GRAPHIC OF SEPTRIN OR COTRIMOXAZOLE.	S		
823		Can you tell me the <u>main</u> reason why you are not <u>currently</u> taking Septrin or cotrim? SELECT ONLY ONE	NOT BEEN PRESCRIBED= 1 I HAVE TROUBLE TAKING A TABLET EVERYDAY = 2 I HAD SIDE EFFECTS/RASH = 3 FACILITY TOO FAR AWAY FOR ME TO GET SEPTRIN OR COTRIMOXAZOLE REGULARLY = 4 COST OF MEDICATIONS = 5 COST OF TRANSPORT = 6 FEEL HEALTHY/NOT SICK = FACILITY WAS OUT OF STOCK = 7 DOCTOR SAID NO LONGER NEEDED = 8 OTHER (SPECIFY) = 96 _____		S		

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS /FILTERS	CORE/ SUPPLEMENT/ OPTIONAL	AKAIS ONLY	NOTES
			DON'T KNOW = 98 REFUSED TO SAY = 99				
824		In the last 12 months, how often did a health care provider weigh you?	EVERY VISIT = 1 SOME VISITS = 2 NEVER = 3 DON'T KNOW = 98 REFUSED TO SAY = 99	IF NEVER, DK, REFUSED → 827	S		
825		In the last 12 months, were you told by your health care provider that you were underweight or had a low weight?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY =9 9	IF NO, DK, REFUSED → 827	S		
826		Were you given a nutritional supplement or referred for a nutritional consult?	NO, NEVER GIVEN SUPPLEMENT/REFERRED = 1 YES, GIVEN SUPPLEMENT = 2 YES, REFERRED = 3 BOTH GIVEN SUPPLEMENT AND REFERRED = 4 DON'T KNOW = 98 REFUSED TO SAY =99		S		

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT/ OPTIONAL	AKAIS ONLY	NOTES

827		Have you ever attended a support group for HIV-positive people?	YES = 1 NO=2 DON'T KNOW = 98 REFUSED TO SAY=99	IF NO, DK, REFUSED 900	S		
828		In the last 12 months, how many times did you attend a support group?	CODE 00 IF NONE NUMBER OF TIMES _____ DON'T KNOW = 98 REFUSED TO SAY = 99				
829		Which of the following do you receive from the support group related to your HIV infection? CHECK ALL THAT APPLY.	POSITIVE LIVING MESSAGES = 1 INFORMATION ABOUT HIV SERVICES = 2 REMINDED OF IMPORTANCE OF TAKING ARV REGULARLY = 3 REMINDED TO KEEP HIV APPOINTMENTS = 4 REFILLS OF ART MEDICATION = 5 HOME-BASED CARE = 6 PICKING UP ARV MEDICATIONS = 7 PSYCHOSOCIAL SUPPORT = 8 LIVELIHOOD/MATERIAL SUPPORT = 9 NOTHING = 10 DON'T KNOW = 98 REFUSED TO SAY = 99		S		

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT / OPTIONAL	AKAIS ONLY	NOTES
830		At the last HIV care visit, were you asked if you had any of the following: cough, fever, night sweats,	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY = 99				

		or weight loss?					
831		In the last 12 months, have you experienced the following: cough, fever, night sweats and weight loss?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY = 99	IF NO, DK, REFUSED → NEXT MODULE			
832		The last time you experienced any of the four symptoms (cough, fever, night sweats, weight loss), were any of the following tests done to look for TB? A sputum test is when the patient has to cough and collect the sample in a cup. CHECK ALL THAT APPLY	CHEST X-RAY = 1 SPUTUM TEST = 2 NONE OF THESE = 3 DON'T KNOW = 98 REFUSED TO SAY = 99				
NO.	VARNAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT / OPTIONAL	AKAIS ONLY	NOTES
833		In the last 12 months, have you ever been given Isoniazid (INH) to prevent developing TB?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY = 99	IF NO,DK, REFUSED →NEXT MODULE SHOW GRAPHIC OF ISONIAZID.			

834		How many months did you take INH?	MONTHS ___ CURRENTLY TAKING INH = 96 DON'T KNOW = 98 REFUSED TO SAY = 99				

MODULE 9: TUBERCULOSIS AND OTHER HEALTH ISSUES

Now I will ask you about tuberculosis or TB.							
900		Have you ever visited a clinic for TB diagnosis or treatment?	YES = 1 NO=2 DON'T KNOW = 98 REFUSED = 99	IF NO, DK, RE-FUSE⍰1001			
901		Have you ever been told by a doctor, clinical officer or nurse that you had TB?	YES = 1 NO=2 DON'T KNOW = 98 REFUSED = 99				
902		Were you <u>ever</u> treated for TB?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED = 99				
903		Are you currently on treatment for TB?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED = 99				

904		The last time you were treated for TB, did you complete at least 6 months of treatment?	YES = 1 NO =2 DON'T KNOW = 98 REFUSED = 99				

FOR FEMALE RESPONDENTS ONLY
Now I'm going to ask you about tests a health care provider can do to check for cervical cancer. The cervix connects the uterus to the vagina. The tests a health care provider can do to check for cervical cancer are called a Pap smear, HPV test and VIA test.

For a Pap smear and HPV test, a health care provider puts a small stick inside the vagina to wipe the cervix and sends the sample to the laboratory. For a VIA test, a healthcare worker puts vinegar on the cervix and looks to see if the cervix changes color.

905		Have you ever been tested for cervical cancer?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY = 99	IF NO, DK, REFUSED → SKIP TO NEXT MODULE FEMALE ONLY.	S		
906		When was your last test for cervical cancer?	MONTH __ __ DON'T KNOW =98 REFUSE TO SAY=99 YEAR __ __ __ __ DON'T KNOW=9998 REFUSED TO SAY=9999	FEMALE ONLY	S		
907		What was the result of your last test for cervical cancer?	NORMAL = 1 ABNORMAL = 2 DON'T KNOW = 98 REFUSED TO SAY = 99	If 1 / 98/ 99 → NEXT MODULE FEMALE ONLY	S		
908		Did you receive treatment after your last test for cervical cancer?	YES, I WAS TREATED ON THE SAME DAY = 1 YES, I RECEIVED TREATMENT ON A DIFFERENT DAY = 2 NO, DID NOT RECEIVE TREATMENT = 3 REFERRED = 4 DON'T KNOW = 98 REFUSED TO SAY = 99	FEMALE ONLY	S		

MODULE 10: BLOOD SAFETY AND MEDICAL INJECTIONS

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS /FILTERS	CORE/ SUPPLEMENT/ OPTIONAL	AKAIS ONLY	NOTES
1001		Have you ever had a blood transfusion?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY=99	IF NO, DK, REFUSED → 1003		Y	
1002		In what month and year was the last time you had a blood transfusion?	MONTH __ __ DON'T KNOW =98 REFUSE TO SAY=99 YEAR __ __ __ __ DON'T KNOW=9998 REFUSED TO SAY=9999			Y	
1003		Have you ever donated blood?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY=99	IF NO, DK, REFUSED → 1011		Y	

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT/ OPTIONAL	AKAIS ONLY	NOTES
1004		Have you donated blood in the last 12 months?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY=99	IF NO, DK, REFUSED → 1010		Y	

1005		How many times did you donate blood in the last 12 months?	NUMBER OF TIMES: __ __ DON'T KNOW = 98 REFUSED TO SAY=99			Y	
1006		The last time you donated blood, were you asked to donate or did you donate voluntarily?	WAS ASKED TO DONATE = 1 DONATED VOLUNTARILY = 2 DON'T KNOW = 98 REFUSED TO SAY=99	IF 2, DK (98), REFUSED (99) → 1008		Y	
1007		Who asked you to donate blood the last time?	FAMILY / FRIENDS = 1 NATIONAL BLOOD TRANSFUSION SERVICE (NBTS) = 2 HOSPITAL = 3 OTHER (SPECIFY) = 96 _____ DON'T KNOW = 98 REFUSED TO SAY=99			Y	

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT/ OPTIONAL	AKAIS ONLY	NOTES

1008		Where was your <u>last</u> blood donation made?	MOBILE DRIVE (SCHOOL, COLLEGE, CHURCH, WORKPLACE, PUBLIC GATHERING) = 1 NIGERIA NATIONAL TRANFUSION CENTER = 2 PUBLIC HOSPITAL = 3 MISSION HOSPITAL = 4 PRIVATE HOSPITAL = 5 OTHER (SPECIFY) = 96 _____ DON'T KNOW = 98 REFUSED TO SAY=99			Y	
1009		What was the <u>main</u> reason you donated blood this <u>last time?</u> SELECT ONLY ONE	IN RESPONSE TO PUBLIC REQUESTS FOR BLOOD DONORS (CIVIC/ALTRUISTIC REASONS) = 1 AS PART OF A BLOOD COLLECTION DRIVE (THERE WAS A BLOOD DRIVE WHERE I WORK, GO TO SCHOOL, SHOP) = 2 SPECIFICALLY FOR A FAMILY MEMBER OR FRIEND = 3 AS PART OF A BLOOD DONOR CLUB = 4 IN EXCHANGE FOR COMPENSATION (FROM A FRIEND OR FAMILY) = 5 I AM A REGULAR DONOR = 6 TO KNOW MY HIV STATUS = 7			Y	

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT/ OPTIONAL	AKAIS ONLY	NOTES
			OTHER (SPECIFY) = 96 _____ _____ DON'T KNOW = 98 REFUSED TO SAY=99				
1010		Are you planning to donate blood in the future?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY=99			Y	
1011		Now I would like to ask you some questions about any injections you have had in the last 12 months. Have you had an injection for any reason in the last 12 months?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY=99	IF NO, DK, REFUSED 1101 NEXT MODULE		Y	
1012		Have you had an injection in the last 12 months that was administered by a doctor, a clinical officer, a nurse, a pharmacist, a dentist, or any other health worker?	YES = 1 NO = 2 DON'T KNOW = 98 REFUSED TO SAY=99	IF NO, DK, REFUSED 1015		Y	

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT/ OPTIONAL	AKAIS ONLY	NOTES
1013		How many injections did you have? IF NUMBER OF INJECTIONS IS GREATER THAN 90, OR DAILY FOR 3 MONTHS OR MORE, RECORD '90'. IF NON-NUMERIC ANSWER, PROBE TO GET AN ESTIMATE	NUMBER OF INJECTIONS: __ DON'T KNOW = 98 REFUSED TO DAY-99			Y	
1014		The last time you received an injection from a health worker, did the health worker take the syringe and needle from a new, unopened package?	YES = 1 NO=2 DON'T KNOW = 98 REFUSED TO SAY=99			Y	
1015		Have you had an injection in the last 12 months that was administered by a traditional practitioner or healer?	YES = 1 NO=2 DON'T KNOW = 98 REFUSED TO SAY=99	If NO, DK, REFUSED 1017		Y	

1016		In the last 12 months, have you <u>given yourself</u> an injection that was prescribed by a doctor, a clinical officer, a nurse, a pharmacist, a dentist, or any other health worker?	YES = 1 NO=2 DON'T KNOW = 98 REFUSED TO SAY=99			Y	
NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/SUPPLEMENT/OPTIONAL	AKAIS ONLY	NOTES
1017		If you have a choice, would you like to receive medication as an injection or pill?	INJECTION = 1 PILL = 2 NO PREFERENCE = 3 DON'T KNOW = 98 REFUSED TO SAY=99			Y	

MODULE 11: NON-PRESCRIPTION DRUG USE/ALCOHOL USE

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT/ OPTIONAL	AKAIS ONLY	NOTES
1101		How often do you have a drink containing alcohol?	NEVER = 1 MONTHLY OR LESS = 2 2-4 TIMES A MONTH =3 2-3 TIMES A WEEK = 4 4 OR MORE TIMES A WEEK = 5 DON'T KNOW = 98 RESFUSED TO SAY=99	IF NEVER, DK, RESFUSED 1104			
1102		How many drinks containing alcohol do you have on a typical day when you are drinking?	1 OR 2= 1 3 OR 4= 2 5 OR 6 =3 7 TO 9 = 4 10 OR MORE = 5 DON'T KNOW = 98 RESFUSED TO SAY=99		O		
1103		On one occasion, how often do you have six or more drinks?	NEVER = 1 LESS THAN MONTHLY = 2 MONTHLY = 3 WEEKLY = 4 DAILY OR ALMOST DAILY = 5 DON'T KNOW = 98 RESFUSED TO SAY=99		O		

NO.	VAR-NAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT/ OPTIONAL	AKAIS ONLY	NOTES

1104		In the past 12 months which of the following substances have you used to get high? READ OUT ALOUD	COCAINE 1 HEROINE=2 INDIAN HEMP=3 TRANQUILIZERS=4 CODEINE=5 SNIFFING PETROL=6 SNIFFING TOBACCO=7 SNIFFING BURNING RUBBER=8 SNIFING GUM=9 INHALING SEWAGE/ GUTTERS=10 NEVER USED=11 OTHER (SPECIFY) = 96 _____ DON'T KNOW = 98 RESFUSED TO SAY=99			Y	
1105		Some people inject drugs with a needle and syringe for pleasure. Have you ever injected drugs for pleasure?	YES = 1 NO = 2 DON'T KNOW = 98 RESFUSED TO SAY=99	IF NO, DK, REGUSED END INTERVIEW	0		
1106		Have you injected drugs with a needle and syringe in the past 3 months?	YES = 1 NO = 2 DON'T KNOW = 98 RESFUSED TO SAY=99	IF NO, DK, REGUSED END INTERVIEW	0		
NO.	VARNAME	QUESTIONS	CODING CATEGORIES	SKIPS/ FILTERS	CORE/ SUPPLEMENT/ OPTIONAL	AKAIS ONLY	NOTES
1107		When you have injected drugs during the last 3 months, have you shared the syringe or needle	YES = 1 NO = 2 DON'T KNOW = 98 RESFUSED TO SAY=99	IF NO, DK, REFUSED END INTERVIEW	0		

		with other people?					
1108		Did you know the HIV status of everyone with whom you were sharing needles?	YES = 1 NO = 2 DON'T KNOW = 98 RESFUSED TO SAY=99	END INTERVIEW		Y	